# Timing of First Births and Number of Children: Differences by Education and Race/Ethnicity, U.S. 2006-2013

***Sandra M. Florian***
***Ph.D. Candidate***
***sandraf@usc.edu***

**Department of Sociology**
**Dana and David Dornsife College of Letters, Arts, and Sciences**
**University of Southern California**

851 Downey Way
Hazel Stanley Hall 314
Los Angeles, CA 90089-1059

# Timing of First Births and Number of Children: Differences by Education and Race/Ethnicity, U.S. 2006-2013

***Sandra M. Florian***

*Racial differences in childbearing behaviors are linked to social inequality in the U.S. In general, disadvantaged racial/ethnic minorities start having children at younger ages and have more children than Whites. In this paper I use data from the National Survey of Family Growth (NSFG 1973 to 2011–2013) to analyze fertility trends and evaluate the extent to which racial differences in recent cohorts can be explained by differences in education, marital status, and other sociodemographic factors. The trends show a small reduction in the differences in age at first birth and number of children by race in recent years. Most of the racial differences are concentrated at low levels of education; whereas no significant racial differences exist among college graduates. These findings leave little room for cultural explanations to account for racial differences in fertility behaviors and instead support the racial stratification perspective. The results suggest that disadvantaged racial/ethnic minorities are exposed to social contexts conductive to early and higher levels of fertility. The results also confirm a strong decoupling from marriage and childbearing at low levels of education, and suggest that cohabitation is indistinguishable from marriage as a reproductive institution among the low educated.*

Fertility trends in the U.S. show persistent educational and racial differences in childbearing behaviors. Overall, low educated individuals and disadvantaged ethnic minorities start having children at younger ages and have more children than individuals with higher education and Whites, respectively (Ellwood & Jencks, 2004; McLanahan, 2009). Previous studies have found convergence in fertility rates by race/ethnicity, but have indicated a divergence in the age at first birth, with Whites delaying motherhood more than African Americans and Hispanics (Bloom & Trussell, 1984; Parrado & Morgan, 2008; Rindfuss, Morgan, & Offutt, 1996). As fertility behaviors evolve, it becomes important to evaluate whether racial differences persist in recent cohorts. In this paper, I analyze new data from the 2006-2010 and 2011-2013 National Survey of Family Growth (NSFG) and examine differences in fertility by education and race among women aged 32–44, and I evaluate the extent to which racial/ethnic differences remain once sociodemographic factors are parceled out. I also examine the role of marital and partnership status across racial and educational groups in shaping fertility behaviors.

Analyzing racial differences in fertility behaviors is important because the divergent trends in childbearing, coupled with the postponement of marriage, have been linked to the recent growth in social inequality among families with children (McLanahan & Percheski, 2008; McLanahan, 2009; Western, Bloome, & Percheski, 2008). However, as the age at first birth among advantaged groups have reached relatively high levels, and given possible social deadlines for childbearing (Billari et al., 2011), further increases in age at first birth among advantaged groups are unlikely to continue at the same pace, allowing the possibility for less advantaged groups to catch up with these behaviors. Confirming this expectation, the results

indicate that the racial and educational differences in age at first birth and number of children have slightly decreased in recent years. The postponement of motherhood among women with high school and higher education, as well as among Whites, have slowed down. The mean age at first birth for these groups even show a slight decline; whereas the mean age at first birth for those did not graduate from high school has moderately increased. The results show that although the educational gap remains large, it has slightly closed in the last few years. Moreover, in line with previous research, I found that most of the racial differences are due to variations in the educational composition of racial/ethnic groups; the racial differences in fertility behaviors are concentrated at low levels of education and are considerably smaller than the differences observed in overall averages by racial groups. Among college educated women no significant racial differences exists.

These findings leave little room for cultural explanations to account for racial/ethnic differences in fertility rates, since only significant racial differences are found among the low educated, and part of these differences are explained by sociodemographic characteristics and age at first birth. The results are more in line with the racial stratification argument, which states that disadvantaged racial/ethnic minorities are exposed to social contexts that offer little opportunities to young adults to encourage delay childbearing or lower fertility.

Furthermore, in line with the argument of the decoupling of marriage and childbearing among disadvantaged populations, I also found that marriage has a negligible impact in the fertility behaviors of low educated women, but it differently shapes the fertility outcomes of the more educated. Cohabitation is indistinguishable from marriage as a context for childbearing for low educated women; by contrast, among the college educated, cohabitation falls in between marriage and being single. Educational attainment remains the strongest predictor of fertility behaviors, emerging as an important tool for policy implementation.

## Background

Racial differences in fertility behaviors have captured the attention of sociologists and demographers. Previous studies have found large differences in the fertility behaviors of women by race, with high rates of early childbearing and higher achieved fertility among disadvantaged ethnic minorities, and delayed childbearing and lower fertility among Whites (Musick, England, Edgington, & Kangas, 2009; Yang & Morgan, 2003). Nonetheless, prior research has indicated that education accounts for some of these differences, however, even after adjusting for education, racial difference in fertility behaviors remain. Three major explanations have been posed to explain these racial differences.

### Explaining racial differences in fertility behaviors

The *structural explanation* poses that racial/ethnic differences are explained by socioeconomic conditions such as educational attainment, family background characteristics, and income, among others (Edin & Kefalas, 2005a; Musick et al., 2009; Schoen, Landale, Daniels, & Cheng, 2009). In low-income communities, low educational and career expectations often translate in skepticism about the future, resulting in perceived low opportunity costs to early and high fertility. Some scholars have argued that the high rates of early childbearing among African Americans can be traced to the early initiation of sexual activity resulting from the lack of parental supervision and stress derived from poverty and family instability (neckerman;(Wu & Martinson, 1993). Other scholars have argued that early childbearing and high fertility is often

found among low-income women, independent of race and ethnicity, and have traced these behaviors to the limited alternative meaningful adult roles and few opportunities for self-development (Edin & Kefalas, 2005b).

By contrast, the *cultural argument* attributes racial/ethnic fertility variation to differences in attitudes, norms, and cultural values. For example Hispanics are said to have pronatalist values that emphasize the importance of the family, and that encourages early family formation and higher fertility (Choi, 2014; Landale & Oropesa, 2007). According to the assimilation theory, cultural norms and values are stronger among recent immigrants and shade with longer time in the U.S. However, the fertility behaviors of foreign-born women are also constrained by the particular circumstances of the immigration process, such as selectivity, fertility disruption during migration, and resuming behaviors after settlement (Choi, 2014; Frank & Heuveline, 2005; Parrado, 2011). Some scholars have argued that in low-income African American communities, early and nonmarital fertility have become the norm; girls do not feel they are losing much by having a child, instead they see motherhood as a symbol of adulthood, an attestation of womanhood (Edin & Kefalas, 2005; Neckerman 1987). It should be noted that structural and cultural explanations are not mutually exclusive; cultural factors may have developed as a response to structural factors, and structural factors can be constrained by cultural norms. The racial stratification perspective brings up some insights.

The *racial stratification perspective* emphasizes exclusionary structural factors at the base of racial differences, tracing the current socioeconomic situation of racial/ethnic minority groups to their historical and cultural legacy. The U.S. is a racially stratified society. Historically, privileges and benefits, such as educational, residential, and occupational opportunities, have been distributed based on a racial hierarchy. The effects of historical discrimination are still perceptible in recent times (Frank and Heuveline 2005; Parrado & Morgan, 2008; Telles & Ortiz, 2008). Some studies have found support for the racial stratification perspective, suggesting the importance of social contexts and patterns of racial exclusion in shaping fertility outcomes (Choi, 2014; Frank & Heuveline, 2005).

### *Fertility and Marital and Partnership Status*

Marriage in the U.S. is considered as the optimal milieu for reproduction, and most children are still born within marriage (Hayford, Guzzo, & Smock, 2014). However, in the recent decades marriage has become decoupled from childbearing; more couples are marrying for purposes other than reproduction, and many single individuals are no longer waiting to get married to have children (Cherlin, 2004; Hayford et al., 2014; Morgan & Rindfuss, 1999). Cohabitation has gained acceptance as an alternative family context for childbearing. Individuals from all socioeconomic backgrounds are postponing marriage, however mostly the most advantaged are also postponing childbearing, thus a large gap in the rates of nonmarital fertility has emerged by social classes (Ellwood & Jencks, 2004; Hayford et al., 2014; Musick, 2007).

In this paper, I conduct analyses separately by educational attainment to investigate the differences in fertility behaviors by race and marital status among a recent cohort of women who reached ages 32-44 during 2006-2013. Few recent studies have analyzed racial/ethnic differences in fertility levels within educational groups. Yang and Morgan (2003) evaluated differences in fertility levels by education and race; however, educational attainment was broadly categorized in two groups one for those with less than 13 years of formal education, and the other one for those with 13 years or more. Now that most women graduate from high school and go on to complete some college education; those who do not graduate from high school are increasingly

becoming a selective group, thus, it becomes crucial to separately evaluate the factors predicting fertility outcomes among this selective group, and well among women who go on to complete college degrees. Schoen at al. (2009) analyzed fertility differences across four educational groups, those with less than high school, high school, some college, and college education; however the analysis is limited to family formation transitions until age 24. Now that half of women who eventually become mothers have not started childbearing by age 24, it becomes necessary to evaluate fertility behaviors at older ages. Musick et al. (2009) also evaluated differences across these four educational groups, however this analysis is limited to white and blacks only. I expand previous research by comparing fertility behaviors among these four educational groups using recent data, and by analyzing racial differences including Whites, African Americans, native-born Hispanics and foreign-born Hispanics.

### *Contribution to the literature*

I contribute to the literature in several ways. First, I analyze trends in age at first birth and number of children using nationally representative data that extend until 2013, and show that the trends by education and race are no longer growing apart, but have instead slightly converged in the recent years. Second, I extend the traditional White/Black comparison by including Hispanics, disaggregating this group by nativity. Given that the fertility of immigrant women are shaped by the immigration process, and conditions affecting fertility in immigrant's countries of origin, distinguishing between native-born and immigrant women can shed light on how fertility behaviors differ by these two groups. Third, given that women in these age frame have not ended their reproductive lives, I compare the results from two different models, Poisson models, that predicts number of children and has previously been implemented in previously studies (Brand & Davis, 2011; Choi, 2014), and a conditional Poisson model, that predicts number of children conditional on having entered motherhood, which, to my knowledge, has not been previously implemented. Comparing the results from both methodologies provides some insights on cases in which the racial differences in achieve fertility rates can be accounted for by the probability of overcoming the hurdle of being childless rather than by having more children. Fourth, while most studies that analyze fertility levels control for age at first birth, little attention has been given to how the differences in fertility levels are due to variations in age at first birth. In this study I compare the regression results before and after controlling for age at first birth, and I show that the timing of entrance into parenthood is still an important predictor of achieved fertility, however, mainly for low-educated women.

## Data, Measures, and Methods

### *Data*

The National Survey of Family Growth (NSFG) is a nationally representative survey of women ages 15 to 44 in the U.S. that collects data on reproductive behaviors, transitions in family formation, socioeconomic background, demographic characteristics, and health related issues. The NSFG has been conducted repeatedly since 1965, using similar questions on relevant variables of fertility behaviors, thus, it is suitable for the analysis of fertility trends. I use data from the 1973 through 2011-2013 to analyze overall trends in fertility. Later I conduct a multivariate analysis using data from the last two surveys, 2006-2010 and 2011-2013 available online at http://www.cdc.gov/nchs/nsfg.htm.

I restrict my sample to women ages 32-44 most of whom have already began childbearing. I also restrict my sample to Whites, African Americans, and Hispanics. Since 1995 the NSFG began over sampling Hispanic women, a larger sample of Hispanic allows to separate native-born and foreign-born Hispanic. However, given smaller sample sizes, the trends presented before 1995 combine native-born and foreign-born Hispanic women. A small number of respondents in the other race/ethnic category or with missing race information were excluded from the sample. I also excluded mothers with no information on the timing of their first birth, those who reported having had their first child before age 12, and cases with missing values in some of the main covariates. My final sample size is 4,356 women for the 2006-2010 survey and 1,976 women for the 2011-2013, resulting in a combined sample size of 6,332 women aged 32-44.

***Method***

First, I present a graph illustrating the trends in the mean of age at first birth and number of children by race and education from 1973 until 2013. Then, I conduct multivariate analyses separately by four educational groups using the last two recent NSFG surveys, 2006-2010 and 2011-2013. I use event history analysis to evaluate the differences in age at first birth by racial groups. I model the timing of first births using a Cox proportional hazard model. The Cox model estimates the *risk*, also called *hazard*, of having a child conditional on being childless and being at risk of becoming a mother. This model predicts the probability of becoming a mother for the first time taking into account the time of exposure to the risk. In this study, all women are considered at risk entering motherhood from age 12 until they either have a child or the age at interview if become censored. The results are presented in hazard ratios which are the risk or hazard of entering motherhood of each group relative to the referent group or omitted category. In all analyses, I use Whites as the referent group because it is the larger group, and because it facilitates comparisons with most previous studies.

Then I use a Poisson regression to compare birth rates across groups, and then I replicate this model using a conditional Poisson regression modeled through a zero-truncated Poisson model. Poisson regression is suitable for modeling small counts, such as number of children; however, it assumes that the distribution of zeros (childless women, i.e. women having zero children) and positive counts (women having one or more children) are generated by the same process (Long & Freese, 2006), which is unlikely to hold in this case. Because of significant differences in the proportions of women remaining childless by ages 32-44 by demographic groups, I use a zero-truncated Poisson model that predicts number of children conditional on having entered motherhood. In the conditional model, the number of children is predicted based on data of mothers only. In both cases the results are provided in incidence rate ratios (IRR), that is, the birth rate of one group relative to the referent group, holding constant other variables in the model.

**Results**

***Descriptive Results***

Figure 1 presents the trends in the mean age at first birth and number of children from 1973 until 2011-2013. Panel A illustrates the trends in age at first birth by race/ethnicity and shows increasing disparities by race/ethnicity until 2002, and since then, a smaller, but persistent gaps. The greatest difference in age at first birth is observed in 2002 between Whites, with a mean age of 25.4, and African Americans, with a mean age of 21.7, resulting in a 3.7 years gap. In

subsequent years, the gap is reduced to 3.3. The trends until 2002 was greatly driven by the increasing postponement of childbearing among Whites. However, as observed in Panel B, the differences in mean age at first birth by education are larger, peaking in 1995 when the mean age at first birth was 20.0 for women with less than high school and 28.1 for college graduates, a gap of 8.1 years. As this graph shows, this difference is greatly driven by the postponement of childbearing among college graduates, while the age a first birth for women with less than high school education remained relatively stable, only slightly increasing in recent years, reaching 21.4 in 2011-2013, while the postponement of childbearing among college educated women has slowed down.

Panel C shows trends in number of children among women ages 32-44 by race. The greatest differences are observed in the 1970s. In 1973 White women had on average of 3.0 children, while Black women had 3.8 children, and Hispanic women 3.5 children. This is the end of the baby-boom period, which was followed by a significant decrease in fertility rates for all groups and a substantial reduction in the differences in number of children among native-born women. The trends remain pretty much stable since 1995. As expected, the trajectory for foreign-born Hispanics stands as an outlier with a higher mean number of children; however, many of these women began childbearing in their countries of origin. It is worth noting that native-born Hispanics exhibit similar fertility behaviors to African Americans. Panel D shows the trends in the number of children by education. Overall, fertility decreased across all racial groups until 1995, and then remained relatively stable with a slight increase during the 2000s. In all periods women who did not graduated from high school exhibit the highest mean number of children. In 2002, women without a high school degree aged 32-44 had 2.6 children on average and this mean increased to 2.9 during 2011-2013, whereas college graduates averaged 1.5 children during this last period, a difference of 1.4 children.

In sum, Figure 1 shows increasing racial differences in age at first birth during the 1990s and 2000s, although the differences have slightly decreased in recent years, they remain large with an average gap of 3.3 years between Whites and Blacks, and 3.5 years between Whites and native-born Hispanics. Figure 1 also shows a convergence in the number of children by race until 1995, since then the differences have remained relatively stable. Nonetheless, the differences in age at first birth and number of children are much larger by education.

Table 1 presents weighted descriptive statistics for the combined 2006-2010 and 2011-2013 surveys for women aged 32-44. The overall mean age at first birth is 24.7 for all women, ranging from 21.1 for women who did not graduate from high school to 28.8 for college graduates, a range of 7.7 years. By race, the overall the median age at first birth for Whites is 25.7 compared with 22.4 and 22.5 for African Americans and native-born Hispanics, respectively, and 22.9 for immigrant Hispanics, the range by race is 3.3 years. However, part of this difference is due to the higher proportion of Whites who are college educated. Disaggregating mean age at first birth of racial groups by education reveals smaller differences.

Among women with less than high school education the mean age at first birth does not vary much, ranging from 19.9 for native-born Hispanics, followed by 20.0 for African Americans, 20.9 for Whites, to 21.9 for immigrant Hispanics. Among high school graduates, Blacks and native-born Hispanics exhibit the earliest entrance into motherhood with a mean age at first birth of 21.2; whereas Whites exhibit the latest entrance with a mean age of 23.4. The age at first birth increases for all racial/ethnic groups at higher levels of education, among college graduates the mean age at first birth is 27.6 for most racial minorities, and 29.0 for whites, a gap of only 1.5 years.

The average number of children is 2.0 ranging from 2.9 for women with less than high school education to 1.6 for college graduates. The racial differences in the number of children ever born are the greatest among women who have not completed high school, the highest mean is observed for native-born Hispanics 3.4, followed by foreign-born Hispanics 3.2, Blacks 3.0 and only 2.4 for whites. The differences get smaller as education increases. The average number of children among high school graduates ranges from 2.7 for foreign-born Hispanics to 2.0 for whites. Among the college graduates the average number of children is relatively higher for foreign-born Hispanic with an average of 2.0 children compared with 1.6 for whites, and 1.3 for Blacks and native-born Hispanics. It is worth noting that the patterns of childbearing of native-born Hispanic women are more similar to those of African Americans than to those of foreign-born Hispanics, with very close mean age at first birth and number of children, in line with the racial stratification perspective. By contrast, immigrant Hispanic women exhibit the highest observed average number of children, indicating, as previous research have suggested, that immigrant Hispanics are a selected group whose reproductive behaviors are affected by different mechanisms than those shaping the fertility behaviors of native-born groups (Choi, 2014; Frank & Heuveline, 2005; Landale, Schoen, & Daniels, 2010).

***Multivariate results***

The previous descriptive results do not adjust for differences in marital status or sociodemographic variables. I present the results for the multivariate Poisson models run separately by educational groups adjusting for sociodemographic characteristics. Table 2 shows the multivariate results for women with high school education and less, and Table 3 does the same for women with higher education. Model 1 shows the Poisson model predicting the number of children ever born ($Y \geq 0$), including race/ethnicity, marital status, and controlling for age, age squared, and survey wave. Model 2 reproduces Model 1 using a zero-truncated Poisson model, predicting number of children conditional on having entered motherhood ($Y > 0$). The results are shown in incidence-rate ratios (IRR), and the standard errors are shown the IRR in parentheses. Subsequent models introduce controls for other sociodemographic factors (Model 3) and age at first birth (Model 4), as will be noted.

***Racial/ethnic differences in fertility behaviors by educational attainment***

The Poisson model (Model 1) shows an educational gradient in racial differences in the number of children ever born, with the greatest differences found among low educated women, decreasing at higher levels of education. Overall, low educated racial minority women bear more children than Whites. Among women with less than high school education, the number of children for African Americans was 34% greater than it was for Whites, 48% greater for native-born Hispanics, and 40% greater for immigrant Hispanics, holding constant marital status, and women's age. Among high school graduates, relative to Whites, the number of children for African Americans was 42% greater, for native-born Hispanics 24% greater, and immigrant Hispanics 38% greater. The differences in the number of children were smaller among women with some college education; being only 27% and 23% greater for African Americans and native-born Hispanics, respectively, relative to Whites; whereas the difference between foreign-born Hispanics and Whites was not statistically significant. Notably, the results show no significant racial/ethnic differences among native-born college educated women; although foreign-born Hispanics have 29% more children than Whites, controlling for marital status and women's age.

Model 2, replicates Model 1 using a conditional zero truncated Poisson model, predicting number of children conditional on having entered motherhood. For the most part, Model 2 confirms the results by race/ethnicity from Model 1; however it shows a small reduction in the racial differences in the number of children among women with less than high school education, conditional on having entered motherhood, holding constant marital status and race. The rest of the other coefficients remain mostly unchanged.[1]

Model 3 introduces controls for sociodemographic variables including intendedness of first birth, parental education, mother's working status while the respondent was growing up, family structure assessed by the absence of a father, religiosity, and rural residency. Adding these controls slightly reduces the racial/ethnic differences in fertility rates; however, a few changes are noticeable. The coefficient for the expected number of children for high school educated Black women is reduced by 21%, resulting in a reduction of the birth ratio relative to whites from 1.44 to 1.33. Further analysis (not shown, but available upon request), revealed that most of this reduction occurs when intendedness of first birth is introduced in the model. Similarly, the difference between native-born Hispanics and Whites among high school graduates and women with some college education is reduced and becomes nonsignificant. In fact, Whites and native-born Hispanics differ in the number of children they have only among women with less than high school education. This finding indicates that some of the racial difference in fertility rates is due to a higher proportion of first births that are unintended among native-born racial minorities. It is worth noting that these controls have a minimum effect in the difference in birth ratios between Whites and foreign-born Hispanics.

The coefficients for intendedness of first births in Model 3 across all educational groups are in the expected direction, indicating that women whose first birth was unintended have between 19% and 25% more children than women who did not experience an unintended first birth. This finding is in line with previous research indicating that unintended pregnancies lead to higher subsequent fertility and account for some of the educational and racial differences in fertility rates (Guzzo & Hayford, 2011; Musick et al., 2009). However, these coefficients are greatly reduced and become nonsignificant in Model 4, which controls for age at first birth, suggesting that unintended births are highly correlated with age at first birth, in line with previous literature indicating that unintended births tend to occur at young ages (Guzzo & Hayford, 2011; Musick et al., 2009).

Controlling for age at first birth in Model 4, further reduces the racial/ethnic differences in the number of children between Whites, on the one hand, and African Americans and native-born Hispanics on the other hand among low educated women. However, it does not substantively reduce the differences between Whites and foreign-born Hispanics, suggesting that different forces drive the fertility behaviors of immigrant Hispanic women. Net of age at first birth, low educated African Americans have only 20% more children than Whites, a substantial reduction from previous models showing between 40% or 30% higher birth rates for African Americans. The difference in the number of children between Whites and native-born Hispanics remains significant only among women with less than high school education indicating that native-born Hispanics have on average 1.3 more children than Whites. Similarly, in Model 4 the differences between Whites and immigrant Hispanics women remain significant only among

[1] Because zero-truncated Poisson models are subject to bias due to overdispersion, I replicated the model using a Poisson model, which is not subject to bias in the absence of zero counts and the presence of overdispersion, and found similar results, indicating that the zero-truncated coefficients are not biased. (Long & Fresse, p. 383).

women with high school education or less, net of other factors. The reduction of the racial differences in birth rates is greater for low educated native-born women, indicating that the timing of first birth is more consequential for the fertility outcomes of native-born women, but less so for immigrant Hispanics. The racial differences in fertility rates among native-born college educated women were not statistically significant.

***Marital and partnership status and fertility***

As previous research has shown, despite its decreasing relevance marriage is still regarded as the optimal milieu for childbearing, (Gibson-Davis, Edin, & McLanahan, 2005; Hayford et al., 2014), evidenced by the greater number of children observed among married women. However, as the analyses show, the differences in the number of children by marital status are small and mostly non-significant at low levels of education, but large and significant at higher levels of education. Among women with less than a high school degree, cohabitation and marriage are indistinguishable, suggesting that cohabitation has the same meaning as marriage as a family context for childbearing. The difference between ever-married and never-married women is significant only in Model 1, but this difference decreases and becomes nonsignificant in the subsequent conditional models (Models 2–4).

Among high school graduates, Model 1 indicates that women who have ever cohabited but have never married, and single women have fewer children than ever-married women, net of other factors. Although significant differences remain in Model 3, they become nonsignificant after controlling for age a first birth in Model 4. In sum, among low educated women, with less than high school and with high school degrees, no significant racial differences remain in the number of children they have by marital and partnership status conditional on having entered motherhood and controlling for age at first birth.

The differences by marital and partnership status are greater at higher education, suggesting that marriage has the largest effect on fertility rates among more educated women. Among college graduates, Model 1 indicates that women who have ever cohabited but never married have 64% (1 - 0.36 = 0.64) fewer children than ever-married women; while single women have 94% fewer children, net of other factors. These differences are reduced in the conditional models, but remain relatively large. Controlling for age at first birth in Model 4, ever-cohabited but never-married women have 51% fewer children than ever-married women; although the model indicates that single women have 29% fewer children than ever-married women, this difference does not reach statistical significance.

Overall, these findings indicate that marriage is a weak predictor of fertility rates for low-educated women, but it has a larger impact for women with higher education. The results confirm a severe decoupling of marriage and childbearing among low-educated women, and also suggest that cohabitation has a similar meaning as marriage as a context for childbearing among the less educated (Hayford et al., 2014). I conclude that marriage still has a distinctive meaning as a milieu for childbearing but only for more educated women.

***Preliminary Conclusions***

Confirming previous research, I found that most of the differences in fertility levels by race ethnicity occurs at low levels of education (Musick et al., 2009; Yang & Morgan, 2003); however I also found that part of these racial differences can be explained by the age at which women have their first child, attesting to the importance of the timing of entrance into motherhood in shaping fertility outcomes. In general, low-educated disadvantaged ethnic

minorities enter motherhood at younger ages and once they do, they bear children at higher rates than whites. I did not find significant racial/ethnic differences in the fertility behaviors of college educated women. These findings leave little room for cultural arguments on the value of children to explain the differences in fertility rates by race/ethnicity as the differences are not significant at high levels of education, and the differences at low levels of education are reduced in the conditional models and after controlling for age at first birth. If cultural values explain the racial differences in the timing of motherhood it would imply that cultural values shades with higher levels of education, given that these differences are only found among low-educated women. The results are more in line with the racial stratification perspective, which posits that disadvantaged ethnic minorities are exposed to different social and structural contexts that shape their fertility behaviors. Entrance into motherhood continues to be a significant factor determining the number of children ever born among ethnic/racial groups, especially at lower levels of education.

The results also indicate a strong significance association between marital status and fertility behaviors, but mainly among highly educated women. Marital and partnership status seems to have a gradational effect; with no significant effects among women with less than high school education, increasing in predictive power at higher levels of education, and having the strongest effect in the fertility behaviors of college educated women. The results indicate that once never married single women with less than high school education become mothers, they bear children at a similar rate than ever married women. By contrast, among higher educated women, marriage makes a greater difference, having a strong association with age at first birth and fertility levels. In other words, marriage matters for fertility behaviors, but mainly for more educated women. This evidence is in line with the argument of the decoupling of marriage and childbearing among low educated women. Similarly, the results indicate that cohabitation is indistinguishable from marriage as a family context for childbearing among low educated women. I argue that increasing education may constitute an effective strategy to reduce socioeconomic inequality not only because education has direct effects on occupational outcomes and the resources available to adults and children, but also because it has the potential to reduce early childbearing among disadvantaged populations, which leads to higher fertility and contributes to the cycles of disadvantage.

**References**


Billari, F. C., Goisis, A., Liefbroer, a C., Settersten, R. a, Aassve, A., Hagestad, G., & Spéder, Z. (2011). Social age deadlines for the childbearing of women and men. *Human Reproduction*, *26*(3), 616–22. http://doi.org/10.1093/humrep/deq360

Bloom, D. E., & Trussell, J. (1984). What are the determinants of delayed childbearing and permanent childlessness in the United States? *Demography*, *21*(4), 591–611.

Brand, J. E., & Davis, D. (2011). The impact of college education on fertility: evidence for heterogeneous effects. *Demography*, *48*(3), 863–87. http://doi.org/10.1007/s13524-011-0034-3

Cherlin, A. J. (2004). The deinstitutionalization of American marriage. In *Journal of Marriage and Family* (Vol. 66, pp. 848–861). http://doi.org/10.1111/j.0022-2445.2004.00058.x

Choi, K. (2014). Fertility in the context of Mexican migration to the United States. *Demographic Research*, *30*, 703–738. http://doi.org/10.4054/DemRes.2014.30.24

Edin, K., & Kefalas, M. (2005). Promises I Can Keep: Why Poor Women Put Motherhood before Marriage. University of California Press.

Ellwood, D. T., & Jencks, C. (2004). The uneven spread of single-parent families: What do know? Where do we look for Answers? In K. M. Neckerman (Ed.), *Social Inequality* (pp. 3–77). New York, NY: Russell Sage Foundation.

Frank, R., & Heuveline, P. (2005). A crossover in Mexican and Mexican-American fertility rates: Evidence and explanations for an emerging paradox. *Demographic Research*, *12*, 77–104. http://doi.org/10.4054/DemRes.2005.12.4

Gibson-Davis, C. M., Edin, K., & McLanahan, S. (2005). High hopes but even higher expectations: The retreat from marriage among low-income couples. *Journal of Marriage and Family*, *67*(5), 1301–1312. http://doi.org/10.1111/j.1741-3737.2005.00218.x

Guzzo, K. B., & Hayford, S. (2011). Fertility following an unintended first birth. *Demography*, *48*(4), 1493–516. http://doi.org/10.1007/s13524-011-0059-7

Hayford, S. R., Guzzo, K. B., & Smock, P. J. (2014). The Decoupling of Marriage and Parenthood? Trends in the Timing of Marital First Births, 1945-2002. *Journal of Marriage and Family*, *76*(3), 520–538. http://doi.org/10.1111/jomf.12114

Landale, N. S., & Oropesa, R. S. (2007). Hispanic Families: Stability and Change. *Annual Review of Sociology*, *33*, 381–405. http://doi.org/10.1146/annurev.soc.33.040406.131655

Landale, N. S., Schoen, R., & Daniels, K. (2010). Early Family Formation among White, Black and Mexican American Women. *Journal of Family Issues*, *31*(4), 445–474. http://doi.org/10.1177/0192513X09342847

Long, J. S., & Freese, J. (2006). *Regression Models for Categorical Dependent Variables Using Stata, Second Edition*. College Station, TX: Stata Press.

McLanahan, S. (2009). Fragile Families and the Reproduction of Poverty. *The ANNALS of the American Academy of Political and Social Science*, *621*, 111–131. http://doi.org/10.1177/0002716208324862

McLanahan, S., & Percheski, C. (2008). Family structure and the reproduction of inequalities. *Annual Review of Sociology*.

Morgan, S. P., & Rindfuss, R. R. (1999). Reexamining the link of early childbearing to Marriage and to subsequent fertillty. *Demography*, *36*(1), 59–75.

Musick, K. (2007). Cohabitation, nonmarital childbearing, and the marriage process. *Demographic Research*, *16*, 249–286. http://doi.org/10.4054/DemRes.2007.16.9

Musick, K., England, P., Edgington, S., & Kangas, N. (2009). Education differences in intended and unintended fertility. *Social Forces*, *88*, 543–572.

Parrado, E. A. (2011). How high is Hispanic/Mexican fertility in the united states? Immigration and tempo considerations. *Demography*, *48*(3), 1059–80. http://doi.org/10.1007/s13524-011-0045-0

Parrado, E. A., & Morgan, S. P. (2008). Intergenerational fertility among Hispanic women: new evidence of immigrant assimilation. *Demography*, *45*(3), 651–671. http://doi.org/10.1353/dem.0.0023

Rindfuss, R. R., Morgan, S. P., & Offutt, K. (1996). Education and the changing age pattern of American fertility: 1963–1989. *Demography*, *33*(3), 277–290.

Schoen, R., Landale, N. S., Daniels, K., & Cheng, Y.-H. A. (2009). Social Background Differences in Early Family Behavior. *Journal of Marriage and Family*, *71*(2), 384–395. http://doi.org/10.1111/j.1741-3737.2009.00606.x

Western, B., Bloome, D., & Percheski, C. (2008). Inequality among American families with children, 1975 to 2005. *American Sociological Review*, *73*(6), 903–920.

Wu, L. L., & Martinson, B. C. (1993). Family Structure and the Risk of a Premarital Birth. *American Sociological Review*, *58*(2), 210. http://doi.org/10.2307/2095967

Yang, Y., & Morgan, S. P. (2003). How big are educational and racial fertility differentials in the U.S.?*. *Biodemography and Social Biology*, *50*(3-4), 167–187. http://doi.org/10.1080/19485565.2003.9989070

**Table 1. Descriptive Weighted Statistics by Education: Women aged 32 to 44. National Survey of Family Growth (NSFG) 2006-2010 and 2011-2013.**

| | All Women | Less than HS | High School | Some College | College |
|---|---|---|---|---|---|
| Unweighted *N* | 6,332 | 1,042 | 1,626 | 1,831 | 1,833 |
| Weighted % | 100% | 13.97 | 25.89 | 28.05 | 32.09 |
| **% Mothers** | 83.2 | 93.0 | 88.4 | 84.9 | 72.9 |
| **Mean age at first birth** | | | | | |
| All women | 24.7 | 21.1 | 22.7 | 24.4 | 28.8 |
| White | 25.7 | 20.9 | 23.4 | 25.1 | 29.0 |
| Black | 22.4 | 20.0 | 21.2 | 22.4 | 27.6 |
| Native-born Hispanic | 22.5 | 19.9 | 21.2 | 23.6 | 27.7 |
| Foreign-born Hispanic | 22.9 | 21.9 | 22.8 | 23.6 | 27.6 |
| | 3.3 | 1.0 | 2.2 | 2.7 | 1.5 |
| **No. children ever born (Mean)** | | | | | |
| All women | 2.0 | 2.9 | 2.2 | 2.0 | 1.6 |
| White | 1.8 | 2.4 | 2.0 | 1.9 | 1.6 |
| Black | 2.2 | 3.0 | 2.6 | 2.1 | 1.3 |
| Native-born Hispanic | 2.4 | 3.4 | 2.5 | 2.2 | 1.3 |
| Foreign-born Hispanic | 2.8 | 3.2 | 2.7 | 2.1 | 2.0 |
| ***Marital and partnership status (%)*** | | | | | |
| Married or previously | 83.3 | 78.3 | 84.3 | 82.7 | 85.6 |
| Ever cohabited, never married | 11.2 | 16.9 | 11.0 | 12.9 | 7.0 |
| Single, never married nor cohab. | 5.5 | 4.9 | 4.8 | 4.4 | 7.4 |

**Table 2. Poisson and Zero Truncated Poisson (ZTP) Models on Number of Children ever Born for Women with High School Education or Less Incidence Rate Ratios (IRR) and Standard Errors (in parenthesis). NSFG 2006-2010 and 2011-1013: Women aged 32-44.**

| | Less than high school | | | | High school | | | |
|---|---|---|---|---|---|---|---|---|
| | **Poisson Model 1** IRR y≥0 | **ZTP Model 2** IRR y>0 | **ZTP Model 3** IRR y>0 | **ZTP Model 4** IRR y>0 | **Poisson Model 1** IRR y≥0 | **ZTP Model 2** IRR y>0 | **ZTP Model 3** IRR y>0 | **ZTP Model 4** IRR y>0 |
| **Race/Ethnicity** | | | | | | | | |
| White (ref.) | --- | --- | --- | --- | --- | --- | --- | --- |
| Black | 1.34 *** | 1.30 ** | 1.27 ** | 1.20 * | 1.42 *** | 1.44 *** | 1.33 *** | 1.24 ** |
| | (0.12) | (0.11) | (0.11) | (0.10) | (0.09) | (0.10) | (0.10) | (0.10) |
| Native-born Hispanic | 1.48 *** | 1.41 *** | 1.40 ** | 1.31 ** | 1.24 *** | 1.20 * | 1.15 | 1.09 |
| | (0.13) | (0.14) | (0.15) | (0.13) | (0.08) | (0.10) | (0.10) | (0.09) |
| Foreign-born Hispanic | 1.40 *** | 1.31 *** | 1.35 *** | 1.34 *** | 1.38 *** | 1.37 *** | 1.35 *** | 1.33 *** |
| | (0.09) | (0.09) | (0.11) | (0.11) | (0.09) | (0.11) | (0.12) | (0.11) |
| **Marital status** | | | | | | | | |
| Ever Married (Ref.) | --- | --- | --- | --- | --- | --- | --- | --- |
| Ever Cohabited | 1.01 | 1.05 | 1.06 | 1.10 | 0.85 * | 0.85 | 0.80 ** | 0.86 |
| | (0.07) | (0.08) | (0.08) | (0.07) | (0.06) | (0.07) | (0.06) | (0.07) |
| Never Married | 0.61 ** | 0.79 | 0.79 | 0.94 | 0.47 *** | 0.64 * | 0.63 * | 0.67 |
| | (0.12) | (0.14) | (0.14) | (0.15) | (0.08) | (0.13) | (0.13) | (0.14) |
| First birth unintended | | | 1.20 ** | 1.02 | | | 1.24 *** | 1.00 |
| | | | (0.08) | (0.08) | | | (0.07) | (0.08) |
| **Respondant mother's education** | | | | | | | | |
| Less than H. S. (Ref.) | | | --- | --- | | | --- | --- |
| High school | | | 1.04 | 1.04 | | | 0.90 | 0.94 |
| | | | (0.08) | (0.08) | | | (0.06) | (0.06) |
| Some college | | | 1.00 | 0.99 | | | 1.07 | 1.10 |
| | | | (0.11) | (0.10) | | | (0.09) | (0.09) |
| College | | | 0.92 | 0.98 | | | 1.15 | 1.16 |
| **Family of origin characteristics** | | | (0.13) | (0.13) | | | (0.14) | (0.12) |
| R's mother worked | | | 1.03 | 0.98 | | | 0.99 | 1.00 |
| | | | (0.06) | (0.05) | | | (0.06) | (0.05) |
| R's father absent at age 14 | | | 0.93 | 0.90 | | | 1.18 * | 1.11 |
| | | | (0.07) | (0.07) | | | (0.08) | (0.07) |
| Never attends relig. serv. | | | 0.96 | 0.93 | | | 0.97 | 0.95 |
| | | | (0.07) | (0.06) | | | (0.07) | (0.06) |
| Rural residency | | | 0.94 | 0.97 | | | 1.00 | 0.97 |
| | | | (0.07) | (0.07) | | | (0.07) | (0.06) |
| Survey year 2011-2013 | 0.96 | 0.92 | 0.94 | 0.91 | 1.09 | 1.07 | 1.03 | 0.95 |
| | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.06) | (0.06) | (0.05) |
| Age | 1.08 | 1.16 | 1.16 | 1.01 | 0.92 | 0.97 | 0.99 | 0.87 |
| | (0.15) | (0.18) | (0.18) | (0.16) | (0.14) | (0.18) | (0.18) | (0.14) |
| Age squared | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Age at first birth | | | | 1.01 | | | | 1.01 |
| | | | | (0.01) | | | | (0.01) |
| Constant | 0.04 | 0.01 | 0.01 | 0.18 | 0.77 | 0.28 | 0.17 | 4.17 |
| | (0.09) | (0.02) | (0.02) | (0.52) | (2.22) | (0.96) | (0.58) | (12.81) |
| *N* | 1042 | 955 | 955 | 955 | 1626 | 1378 | 1378 | 1378 |
| Log likelihood | -1863.4 | -1621.4 | -1610.9 | -1576.4 | -3121.9 | -2487.7 | -2456.9 | -2400.5 |

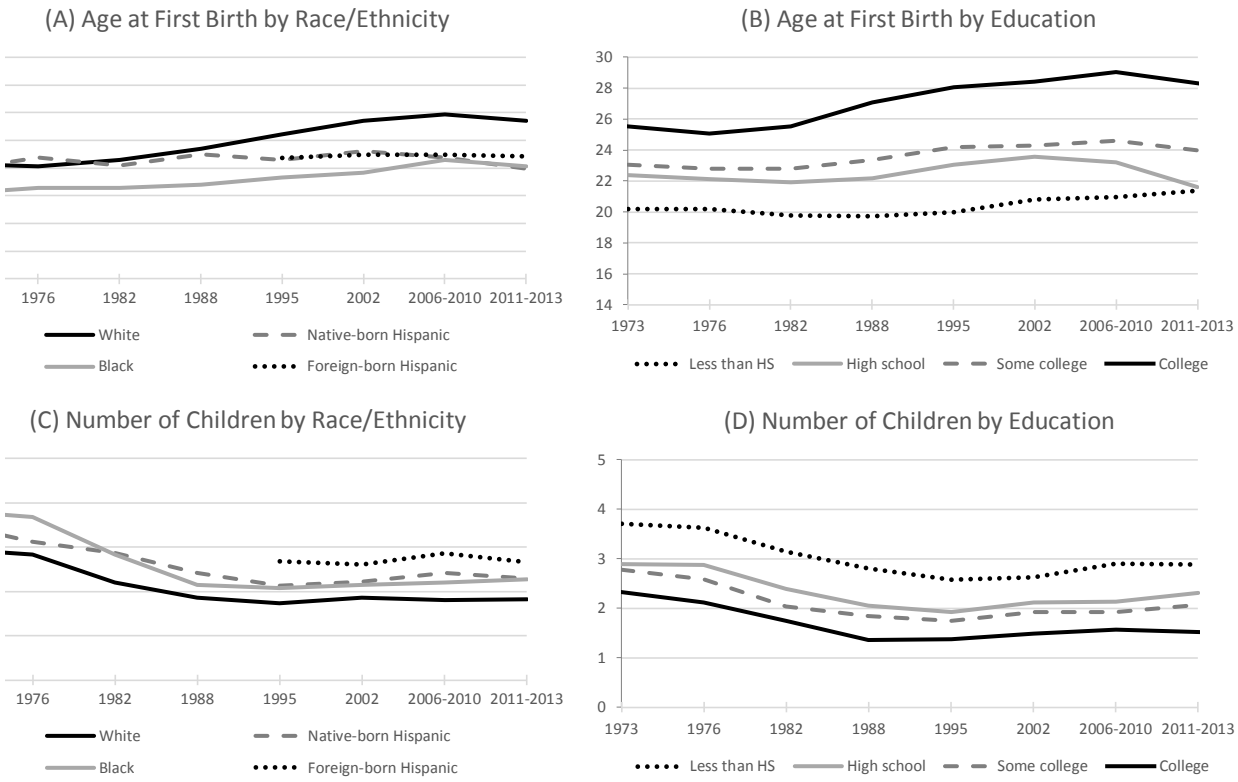
* p<0.05, ** p<0.01, *** p<0.001

**Table 3. Poisson and Zero Truncated Poisson (ZTP) Models on Number of Children ever Born for Women with Higher Education Incidence Rate Ratios (IRR) and Standard Errors (in parenthesis). NSFG 2006-2010 and 2011-1013: Women aged 32-44.**

| | Some college | | | | College | | | |
|---|---|---|---|---|---|---|---|---|
| | **Poisson Model 1** IRR y≥0 | **ZTP Model 2** IRR y>0 | **ZTP Model 3** IRR y>0 | **ZTP Model 4** IRR y>0 | **Poisson Model 1** IRR y≥0 | **ZTP Model 2** IRR y>0 | **ZTP Model 3** IRR y>0 | **ZTP Model 4** IRR y>0 |
| **Race/Ethnicity** | | | | | | | | |
| White (ref.) | --- | --- | --- | --- | --- | --- | --- | --- |
| Black | 1.27 *** | 1.31 *** | 1.26 *** | 1.16 * | 1.01 | 0.93 | 0.89 | 0.92 |
| | (0.07) | (0.08) | (0.08) | (0.07) | (0.08) | (0.09) | (0.09) | (0.08) |
| Native-born Hispanic | 1.23 ** | 1.21 * | 1.18 | 1.10 | 0.94 | 1.05 | 1.03 | 1.06 |
| | (0.09) | (0.11) | (0.11) | (0.10) | (0.12) | (0.13) | (0.12) | (0.09) |
| Foreign-born Hispanic | 1.14 | 1.12 | 1.13 | 0.99 | 1.29 * | 1.27 * | 1.24 | 1.16 |
| | (0.08) | (0.10) | (0.11) | (0.09) | (0.15) | (0.15) | (0.15) | (0.12) |
| **Marital status** | | | | | | | | |
| Ever Married (Ref.) | --- | --- | --- | --- | --- | --- | --- | --- |
| Ever Cohabited | 0.60 *** | 0.67 *** | 0.64 *** | 0.64 *** | 0.36 *** | 0.51 * | 0.51 * | 0.49 ** |
| | (0.05) | (0.07) | (0.06) | (0.06) | (0.06) | (0.15) | (0.15) | (0.13) |
| Never Married | 0.25 *** | 0.63 * | 0.58 ** | 0.64 ** | 0.06 *** | 0.79 | 0.75 | 0.71 |
| | (0.06) | (0.13) | (0.11) | (0.11) | (0.02) | (0.21) | (0.18) | (0.17) |
| First birth unintended | | | 1.25 *** | 0.89 * | | | 1.19 * | 0.86 |
| | | | (0.07) | (0.05) | | | (0.09) | (0.07) |
| **Respondant mother's education** | | | | | | | | |
| Less than H. S. (Ref.) | | | --- | --- | | | --- | --- |
| High school | | | 0.96 | 1.02 | | | 0.92 | 0.93 |
| | | | (0.07) | (0.06) | | | (0.08) | (0.07) |
| Some college | | | 0.99 | 1.01 | | | 0.93 | 0.91 |
| | | | (0.06) | (0.06) | | | (0.08) | (0.07) |
| College | | | 0.88 | 0.97 | | | 1.02 | 1.02 |
| **Family of origin characteristics** | | | (0.07) | (0.07) | | | (0.09) | (0.08) |
| R's mother worked | | | 0.88 * | 0.88 ** | | | 0.93 | 0.93 |
| | | | (0.05) | (0.04) | | | (0.05) | (0.04) |
| R's father absent at age 14 | | | 1.11 | 1.02 | | | 1.05 | 1.03 |
| | | | (0.07) | (0.06) | | | (0.07) | (0.06) |
| Never attends relig. serv. | | | 0.94 | 0.92 | | | 0.82 * | 0.89 |
| | | | (0.07) | (0.06) | | | (0.07) | (0.08) |
| Rural residency | | | 1.06 | 0.96 | | | 0.95 | 0.92 |
| | | | (0.07) | (0.06) | | | (0.09) | (0.08) |
| Survey year 2011-2013 | 1.08 | 1.08 | 1.07 | 1.01 | 0.95 | 1.00 | 1.01 | 0.94 |
| | (0.05) | (0.06) | (0.05) | (0.04) | (0.05) | (0.05) | (0.05) | (0.04) |
| Age | 1.33 * | 1.28 | 1.26 | 1.08 | 0.94 | 0.91 | 0.92 | 0.82 |
| | (0.16) | (0.19) | (0.18) | (0.14) | (0.15) | (0.15) | (0.15) | (0.11) |
| Age squared | 1.00 ** | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Age at first birth | | | | 1.01 | | | | 1.04 *** |
| | | | | (0.01) | | | | (0.01) |
| Constant | 0.00 ** | 0.00 * | 0.00 * | 0.10 | 0.32 | 0.59 | 0.50 | 13.69 |
| | (0.00) | (0.00) | (0.00) | (0.25) | (0.98) | (1.87) | (1.55) | (35.25) |
| N | 1831 | 1456 | 1456 | 1456 | 1833 | 1229 | 1229 | 1229 |
| ll | -3220.0 | -2456.5 | -2430.4 | -2292.5 | -3323.4 | -2203.9 | -2191.8 | -2083.9 |

* p<0.05, ** p<0.01, *** p<0.001

**Figure 1. Trends in Age at First Birth and Number of Children, U.S.: 1973-2013**




Source: National Survey of Family Growth (NSFG), 1973 through 2011-2013, women aged 32 to 44.