

The Significance of Higher Education on the Racial Gap in Marriage Rates

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*Honors Thesis submitted in partial fulfillment of the requirements for Graduation with*

*Distinction in Economics in Trinity College of Duke University.*

Duke University

Durham, North Carolina

2009

## **Acknowledgements**

I would like to thank Professor Marjorie McElroy (Duke University) for providing extensive guidance and insights into my research topic from the perspective of an accomplished researcher. Her encouragement allowed me to pursue my research interests for which I am extremely grateful. I would also like to thank Dr. Joel Herndon and Gary Thompson for their generosity and for helping me to understand how to analyze data using STATA. I am also grateful to all of my classmates, friends, and family who took an interest in my topic, helped me with this project, listened to my concerns, and provided me with inspiration every step of the way.

## **Abstract**

In this paper, I examine the effect higher education has on the age of marriage and how this differs between black and white women. Becker's theory of positive assortative mating in marriage markets lead me to predict higher levels of education would decrease the probability of being married by 30 and 40 for black women more than white women. My probit regressions showed that, despite an initial delay in marriage, increased education had a positive effect on the probability of marriage for black women confirming that lesser educated black women are more at risk of falling into the racial marriage gap.

## I. Introduction

While the overall marriage rate in the United States declined by 17% in the period of 1970 to 2001, the marriage rate in the African-American community has reached significantly low levels (US Census, 2001) causing the Administration for Children and Families (ACF) to conclude that African Americans have lower rates of marriage and marital stability than all other ethnic groups (2009). This decline hits black women the hardest and in 1993, 43.3 percent of black women aged 30-34 were never married as compared to only 15.5 percent of white women in the same age group (Brien, 1997, p. 742). This statistic is leading many black women to wonder if marriage is a dream from which they are excluded.

Moreover, in 1960, 80 percent of black women 20 to 34 years had married at least once; in 2004 the corresponding figure was 32.43 percent (U.S. Census Bureau, 2007). This decrease in marriage has resulted in an increase in the proportion of births to unmarried black women and an increase in black female headship causing social scientists and policy makers to grow concerned. According to the 2000 Census, single female-headed families are far more likely in black homes than in all other groups' homes (45.4% versus 13.7%). (ACF, 2009). These changes in family structure link the decline in black marriage rates to rising black poverty rates, particularly among black children (Wood, 1993, p. 164). Reasons behind the rising poverty rates are that single mothers seldom have high wages and also find it difficult to work long hours since they carry the sole responsibility of caring for their children. Because white women are more likely to marry than to have children while the reverse is true for black women, the lack of marriage opportunities for black women proposes a serious economic threat to the black community (Ellwood & Jencks, 2004, p. 2).

Speculation of the causes for the racial gap in the marriage rate places blame on a variety of issues.

One explanation attributes the gap to the disruptive effects of slavery but this theory is contradicted by the fact that marriage rates of blacks and whites were relatively similar until the 1950s. Figure 2 shows that for a census sample of women 15 years old and over, the percentage of women married in the 1950s was similar for both races of women but started to diverge as time passed with black women reporting a significantly lower percentage than their white counterparts. Similarly, figure 1 shows the percentage of females aged 15 years old and above never married over time. The percentages were almost equal in the 1950s but began to diverge with higher percentages of black women reporting never married over time.

It seems that the divergence of marriage rates highlights a recent shift in the African American culture that has made marriage seem unattainable or unnecessary. One change that may hint at the racial divide is the extreme increase in the number of African American women going to college. Figure 6 shows that as of 2001, in the African American student population, 36 % were males and the remaining 64 % were females. In contrast, in the white student population, a more equal male-female ration prevailed with 44 % being male and the remaining 56 % female. According to the 21<sup>st</sup> Annual Status Report on Minorities in Higher Education (2005), African American women had the most significant numerical increases in US universities and colleges from the fall of 2000 to the fall of 2001. Considering this recent change in the black marriage market, my research question is: what effect does education have on the age of first marriage and how does this differ between black and white women?

Becker's theory of positive assortative mating in marriage markets predicts that the decision to attain higher levels of education among African American women will decrease their chances of marriage. Using the National Longitudinal Survey of Youth, I plan to analyze the role of race, and education on first marriage by age 30 and 40 and observe the racial disparity. The primary purpose of this paper is to find evidence that validates economic theory predicting that the marriage rate divergence is a result of an increase in the number of African American women attaining higher levels of education which leads to a limited marriage market due to a lack of men at these same education levels. Meanwhile, the increase in the number of Caucasian women attaining higher levels of education might lead to a slight increase in the age of first marriage but the decline in marriage rates should not be as devastating due to a thicker marriage market.

In the remainder of my paper, I will first explain Becker's theory of assortative mating within marriage markets in section II. In section III, I will describe some of the previous research on the relationship between education, race, and marriage rates. In sections IV and V I will discuss my dataset with descriptive and quantitative statistics and then my economic models. In section VI, I will present and analyze the results of my regressions. I then will conclude with a summary, and furthermore, the significance of my findings to the topic of the racial gap in marriage rates in section VII. I will also discuss some possible sources of inaccuracy within my study and then ideas for future research.

## II. Becker's Economic Theory on Marriage

In Becker's marriage model, a person enters the marriage market if she or he expects the marital income to exceed their single income (1991). An efficient marriage market assigns imputed incomes or "prices" to all participants to attract suitable husbands. In a model with complete information, participants in the marriage markets are matched optimally as the market maximizes the total output of all marriages. An optimal pairing has the property that persons not married to each other would make at least one of them worse off if they were to marry. Because of this, these imputed incomes also determine who remains single because they cannot do as well by marrying. Applying the theory to the overall decline in marriage rates indicates that women are not marrying because their individual gains are more than the share of joint production they would receive with the men available to them, therefore, making marriage undesirable.

Becker's theory of positive assortative mating indicates that higher-quality men and women marry each other rather than selecting lower-quality mates because these qualities are complements: a superior woman raises the productivity of a superior man and vice versa. One main contributor to an increase in a woman's individual quality is her education level. The higher the degree she has, the more attractive she is in the labor market, which could lead to a higher income. Also a higher degree signals that she may be more efficient in home production and be a better mother. Becker cites correlations between married couples that show positive assortative mating at work. "Even when other traits, like age and wage rates are held constant, the correlation between years of schooling is high: +.53 for white families and virtually the same (+.56) for black families." Moreover, "persons who marry out of their race... or education class have relatively high probabilities of divorce (1991, p.118)." This

evidence cited by Becker suggests that positive assortative mating is the optimal sorting in a marriage market. There are strong correlations consistent with this theory but when this sorting does not occur, the probability of divorce is high signaling the optimality of positive assortative mating.

### **III. Previous Research on Economic Independence and Education on Marriage Rates**

Even though rates of interracial marriage have increased, according to statistics, black women are the least likely racial group to marry outside of their race (Fryer, 2007).

Furthermore, African American men are much more likely to marry white women than African American women are to marry white men. Racially endogamous marriages changed very little for African American women of different educational attainments. In a study by Zhenchao Qian, black women aged 20-29 in 1990 married within their race approximately 97% of the time for all education levels (1997). For this reason, I'm limiting the analysis of the marriage market for black females to black men.

A considerable amount of research has been done to understand the widening gap between black and white marriage rates. One notable conclusion is that the disproportionate ratio of men to women in the black community reduces the marriage rate. The prevailing explanation for the imbalanced sex ratio is William Julius Wilson's hypothesis that the decline in marriage rates among blacks, especially among poor inner-city blacks, can be attributed to declining male employment levels and, therefore, a declining number of young black men able to support a family. This results in a shrinking pool of acceptable mates for black women (Wood, 1993, p. 164). As Fossett and Kiecolt found, a limited pool of African American men causes marriage rates to be low not only because of a scarcity of possible husbands but also, because they are outnumbered, men face a multitude of alternatives and



can avert or delay marriage (South & Lloyd, 1992, p. 441). Additionally, some researchers pinpoint the less educated cohort as the main source of the marriage gap between races. In a recent study, Western and Pettit cite a dramatic rise in incarceration rates among black males, particularly among those less educated during the 1980s (2000, p.4), which can be one possible explanation for the unequal sex-ratios in marriage markets between the black and white community. The high rates of unemployment, incarceration and low education attainment levels among African American men, constrain marriage opportunities for black women, especially those with higher education levels (South & Lloyd, 1992, p. 441). Economic theory agrees with these findings through the idea that women only consider marriage with men who will not make them worse off and, therefore, the utility of a union would exceed her single utility

Another explanation for this gap is a recent decline in the attractiveness of marriage due to increases in economic status. The improvement of economic circumstances for many blacks as individuals, due to declines in racial discrimination in pay rates and increases in public aid, endowed blacks with the ability to act as independent economic units, decreasing the need for marriage (Schoen & Kluegel, 1988, p.904). However, in a study that looked at marriage rates in a military sample, Jennifer Hickey Lundquist found that while the likelihood of marriage is less likely for black civilians than white civilians, black and white military enlistees exhibit similar propensities to marry. She argues that this is because the military provides stable employment and offers opportunities for educational and career mobility that can be absent in civilian society (Lundquist, 2004, p.752). This study shows that in a marriage market with equal opportunities, a racial gap in marriage rates is less likely to occur. Lundquist's study illustrates that in a society with equal opportunities for both men

and women independent of race, positive assortative mating surpasses the ability to be economically independent highlighting that mate suitability drives the decision behind marriage. The conclusions in this study argue against female economic independence as the cause of the marriage gap, rather, it proposes that an inability to mate with someone of a similar status as the source.

In another study, Goldstein and Kenney (2001) used data from the 1995 Current Population Survey in an attempt to determine if an increase in economic independence due to a higher level of female education leads to a decline in the number of individuals who ever marry or simply a delay in the age of first marriage. They found that that for both black and white women, higher educational attainment was associated with a higher likelihood of ever marrying when compared to those with less education. The difference between blacks and whites is not the direction of the effect, but rather the magnitude, meaning a college diploma delays marriage even further for blacks than whites. This result can be seen in recent statistics: the likelihood of marriage by age 30 is considerably lower for non-Hispanic black women, with virtually no differences among the other groups (Hispanic, non-Hispanic Asian, and non-Hispanic White). On the other hand, early marriage (i.e., before the 18th birthday) is more likely among women with less than a high school education and among women whose mothers had less than a high school education (U.S National Center for Health Statistics 2002).

While the majority of previous research on the cause of the racial gap in marriage rates has focused mainly on the less educated cohort, I find that the recent rise in African American women obtaining higher levels of education could be another potential source. Goldstein and Kenney concluded that the likelihood of ever marrying increases with a

women's education level but college education delays marriage even further for black women. Building on their conclusions, the purpose of my paper is to investigate the extent that education, particularly higher education, accounts for the racial gap in marriage rates by examining its role in the delay in the age of first marriage through analyses on two different age cutoffs.

#### **IV. NLSY79 Dataset and Descriptive Statistics**

In this paper, I use data from the National Longitudinal Survey of Youth 1979. The NLSY79 is a nationally representative sample of 12,686 young men and women who were 14-22 years old when the survey began in 1979. These individuals were interviewed annually through 1994 and thereafter on a biennial basis until 2006 when they were 41-49 years old. This survey over samples civilian Hispanic, black, and economically disadvantaged non-black/non-Hispanic youths living in the United States during 1979. Since I am focusing on the female perspective of the marriage dilemma, I excluded a total of 6,403 males from my regression sample. Additionally, since this study focuses on black and white differences, I chose to leave the study of Hispanic women to future research. For this reason, I also excluded the Hispanic population from my regression which was a total of 2,002 respondents. This leaves a sample of 1,561 black females and 3,720 white females.

Table 1 shows the average age of first marriage for white and black women separated by education level. For all education levels, the average age for white women is younger than that of their black counterparts, with the biggest difference being three years apart for high school dropouts (23.89 for black – 19.94 for white). On average, white female high school dropouts had the youngest age of first marriage among both races of women, while black female high school dropouts have the youngest average age of first marriage only

among the black women. The gap narrows as education increases as seen with the similarity in average ages of first marriage for women with post graduate education (27.21 for black-26.35 for white). However, black women who have post graduate education had the highest mean age of first marriage among both races. For white females, the highest mean age of first marriage was among those with a post graduate education level as well. This table shows that a delay in first marriage exists as the average age of marriage increases for both races of women as they obtain more education.

An important fact found in this dataset is that 26.46% of black females reported having at least one child before their first marriages as opposed to only 4.46% of white females. When examining the average age of first marriage of women without non-marital child, table 2 indicates that for all levels of educational attainment, black women and white women have approximately the same average age. For example, while table 1 shows the largest racial difference between the mean ages for high school dropouts, table 2 shows the average ages as approximately identical (18.6 for black women without non-marital child and 18.5 with white women without non-marital child). This suggests that the average age of first marriage could be higher for black women than white women due to a higher number of non-marital births. Similar to table 1, table 2 reveals that for both races, the average age of first marriage increases as the level of educational attainment increases further illustrating the delay in first marriage.

Figure 3 shows the frequency of age of first marriage for white and black women who reported being married at least once by 2006. For white females the most frequent age of marriage is 19 while it is 20 for black women, and the frequency declines with age. The youngest age of first marriage was 13 for women in this sample and the oldest age was 48.

The overall frequency of first marriage is relatively similar for both races for women who reported having ever married by 2006. Since those who do marry have similarities, the intriguing statistic is that of those who never married by 2006.

Figure 4 shows the percentage of black (22.81%) and white (3.52%) women in the NLSY79 dataset who reported that they had never been married by 2006. This graph shows that there is a larger percentage of females never married within the age group of 41 and 49 in the black community than the white community.

Furthermore, table 3 shows the percentage of women who reported never being married by 2006 separated by education level. The percentages of females never married by 2006 tell contrasting stories between the races. For black women, the smallest percentages are among college graduates (7.59% of the black women never married population) and those with post graduate education (5.34% of the black women never married population) while the smallest percentage for white females are those who are high school dropouts (6.83% of the white women never married population). The largest percentage belongs to high school graduates for both races (42.15% of the black women never married population and 34.12% of the white women never married population). Table 3 also shows that high percentages of white females who never had been married among college graduates (20.22%) and also those who had post graduate education (20.16%). These percentages contrast the smaller percentages reported by black women among these same education groups.

Figure 5 shows that the dataset reflects census data by showing that, typically, women born in later years (1963 and 1964) aged 41 and 42 in 2006, have higher percentages of never marrying than those born in 1957 and 1958 who were aged 48 and 49 in 2006. Figure 5 reveals that women who graduated from high school have higher percentages of never being

married and the percentages appear to decrease as education increases. This graph is consistent with Goldstein and Kenney's study which showed that for both black and white women, higher educational attainment was associated with a higher likelihood of ever marrying when compared to those with less education.

As previously mentioned, and as figure 6 illustrates, the percentage of undergraduates, according to the U.S Department of Education, showed a more equal sex ratio for the white population than the black population. Information from the NLSY79 data set was consistent with their findings. Figure 7 shows that the sex ratio for respondents with at least some college education in the white population was more balanced with 52.23% women and 47.77% men, than in the black population, with 58.82% women and 41.18% men. The gender difference is 4.46% in the white community while it is 17.64% in the black community.

Lastly, table 5 demonstrates Becker's positive assortative mating theory at work in the marriage market as it shows women are more likely to marry men who are equivalent with their own quality or education level. As the education level increases for both races of women, the highest grade completed by their husband is more likely to increase as well. For example, high school dropouts, on average, marry men with a similar education level (10.9 for black females' husbands and 11.6 for white females' husbands, meaning they also are high school dropouts). One noteworthy exception is the decrease in husbands' education level seen among black women who have post graduate education (the average highest grade completed by their husbands is 13.3 whereas the average highest grade completed by husbands of black women who are college graduates is 14.2). Table 5 suggests that the education level of their husband will increase as black females' education increases until they

have a post graduate education when their husband's education level decreases. Unlike in the black community, the husbands' highest grade completed continues to increase as white females' education level increases.

### **V. Probit Regression of First Married by Age 30 and 40**

In order to analyze the likelihood of marriage by age 30 and age 40, I chose to run a probit regression since my dependent variables are categorical. In my first model, I exclude the non-marital child variables because the decision to have a non-marital child might be endogenous. Because women make decisions about fertility and marriage simultaneously, there might be a correlation between the decision to have a child and the decision to not get married (Upchurch, Lillard, & Panis, 2002, p.327). Hence, there is a possibility that unobservable traits that make a woman have a non-marital child also make her less likely to marry. My regression equation is:

$$\begin{aligned}
 Pr(\text{Married by Age 30 and 40}) = F(\beta_1 \text{ Race} + \beta_2 \text{ High School Graduate} + \beta_3 \text{ Some} \\
 \text{College} + \beta_4 \text{ College Graduate} + \beta_5 \text{ More than 4 Years of College} + \beta_6 \text{ Born in 1957} \\
 + \beta_7 \text{ Born in 1958} + \beta_8 \text{ Born in 1959} + \beta_9 \text{ Born in 1960} + \beta_{10} \text{ Born in 1961} + \beta_{11} \text{ Born} \\
 \text{in 1962} + \beta_{12} \text{ Born in 1963} + \beta_{13} \text{ Mother's Education} + \beta_{14} \text{ Parents' Income} + \beta_{15} \\
 \text{Parents Together in 1979} + \beta_{16} \text{ North Central Region} + \beta_{17} \text{ South Region} + \beta_{18} \text{ West} \\
 \text{Region} )
 \end{aligned}$$

My second model includes non-marital child variables with the objective to see how the estimated coefficients change with the inclusion of these variables. The equation for this model is:

$$\begin{aligned}
Pr(\text{Married by Age 30 and 40}) = & F(\beta_1 \text{ Race} + \beta_2 \text{ High School Graduate} + \beta_3 \text{ Some} \\
& \text{College} + \beta_4 \text{ College Graduate} + \beta_5 \text{ More than 4 Years of College} + \beta_6 \text{ Non-Marital} \\
& \text{Child} + \beta_7 \text{ Male Child} + \beta_8 \text{ High School Graduate with Non-Marital Child} + \beta_9 \text{ Some} \\
& \text{College Education with Non-Marital Child} + \beta_{10} \text{ College Graduate with Non-Marital} \\
& \text{Child} + \beta_{11} \text{ More than 4 Years of College with Non-Marital Child} + \beta_{12} \text{ Born in 1957} \\
& + \beta_{13} \text{ Born in 1958} + \beta_{14} \text{ Born in 1959} + \beta_{15} \text{ Born in 1960} + \beta_{16} \text{ Born in 1961} + \beta_{17} \\
& \text{Born in 1962} + \beta_{18} \text{ Born in 1963} + \beta_{19} \text{ Mother's Education} + \beta_{20} \text{ Parents' Income} + \\
& \beta_{21} \text{ Parents Together in 1979} + \beta_{22} \text{ North Central Region} + \beta_{23} \text{ South Region} + \beta_{24} \\
& \text{West Region} )
\end{aligned}$$

My first dependent variable is first marriage by age 30 which is a dummy variable that equals 1 if the female's first marriage occurred before or at age 30, while it equals zero if the female was married after age 30 or never married by the year 2006. I chose age 30 because, as table one shows, the highest average age of first marriage was 27 so I rounded up the age to 30. Also, as table four shows, of those who reported to be married at least once by 2006, 84.23% of black women and 93.30% of white women were married by age 30 which is a 9% difference.

The second dependent variable is first marriage by age 40 which is a dummy variable that equals 1 if the female's first marriage occurred before or at age 40, while it equals zero if the female was married after age 40 or never married by the year 2006. I chose age 40 because all of the females in my dataset reached this age by the year 2005. Table 4 indicates



that the racial gap is smaller in percentage married by 40 as the percentage was 98.17% for black females and 99.5% for white females which is only a 1.3% difference.

I performed the two probit regressions for both dependent variables on three different samples consisting of only black females, only white females, and then black and white females pooled together.

#### Explanation of Independent Variables:

- (i) Race is a dummy variable that is omitted in the race specific regressions. Race equals 1 for a black female and 0 for a white female. I expect that this variable will have a negative coefficient since black females have a lower probability of marrying by age 30 than white females.
- (ii) Education is a split into five different categories: high school dropout (which includes grade 11 and lower), high school graduate (the highest grade completed was 12<sup>th</sup> grade), some college (in-between and including grades 13 and 15), college graduate (highest grade completed was 16<sup>th</sup> grade), and post graduate education (higher than and including grade 17). I separated the education levels into 5 categorical variables in order to determine the effect each has on the probability of first marriage. For a high school graduate, the variable “high school graduate” would equal 1 and the other education variables would equal 0. For a female with some college, the variable “some college” would equal 1 and so on. I predict that the coefficients on these variables will be positive for women in lower levels of education but negative for women with college graduate and more education attainment levels.
- (iii) “Mother’s Education” is a measure of the highest grade completed by the females’ mother. The grades range from 0 (no education) to 20 (eighth year college or more). I expect the coefficient on this variable to be negative because it is more likely that the female respondent will have higher levels of education if they have highly educated mothers thereby reducing their chances of marriage.
- (iv) Net family income is a NLSY79 created variable measured in 10 thousands by the variable “Parents’ Income in 1979” and I expect the coefficient on this to be positive in the pooled regression and in the white regression but negative in the black female sample.
- (v) The respondent’s region is measured by the dummy variables “North Central Region”, “South Region”, and “West Region”. “North Central Region” equals 1 if the female lives in North Central US; “South Region” equals 1 if the female lives in the South; “West Region” equals 1 if the female lives in the West. All three equal zero if the residence is in Northeast US. I expect that the coefficient of “South Region” will be positive in the pooled and white samples.
- (vi) The dummy variable “Non-Marital Child” measures if the female had a child before her first marriage or not. The variable equals 1 if the first marriage

happened after the first birth meaning there was child present before her first marriage. This variable also equals one for women who reported never being married by 2006 but also reported having a child. I expect the coefficient on this variable to be negative for all three samples because potential husbands may view the child as a financial responsibility they would have to incur if they married the mother.

- (vii) High School Graduate with Non-Marital Child, Some College with Non-Marital Child, College Graduate with Non-Marital Child, and Post Graduate Education with Non-Marital Child are interactions between the variables Non-Marital Child and Education to show the relationship between the female's level of education and a child's presence. I expect that the coefficients on these variables will be positive and the magnitude will increase as the variable increases, meaning Post Graduate Education with Non-Marital Child will have the greatest effect. I think this because as a woman's education level increases, so does the perception of her ability to support a child, in terms of money and being a good mother. Therefore men will be less concerned with the responsibility of having to support the child.
- (viii) Male Non-Marital Child is a variable that equals 1 if the respondent reported that she had a male child before her first marriage. I expect this coefficient to be positive for all three samples because male children might be valued more highly in society than female children, therefore counteracting any negative effect having a child has on age of first marriage.
- (ix) "Born in 1957 through 1964" are fixed time effects that indicate which year each respondent was born. These variables equal 1 in each individual's particular birth year and then 0 in the other years. I expected, for all three samples, that the coefficients on the variables for individuals born in earlier years will have a larger effect on age of first marriage than variables for those born in later years. This is because as years progress, there is less emphasis on women fulfilling traditional roles therefore allowing women to not worry about marrying at a young age.
- (x) "Parents Together" is a variable that indicates if the female respondent's parents were together in 1979 (when the respondent was 14-22 years old). I expect that this will have a positive effect because this will increase the likelihood that the respondent places a higher value on being married.

Table 6 shows the means which indicate the fraction of the sample involved, standard deviations, minimums and maximums of the independent variables used in the regressions. The means for the samples used in the age 40 probit are similar to those seen in table 6 and therefore were unnecessary to report. For both races, the majority of women in the sample were high school graduates (43% of black women and a similar percentage of 44% for white women). There were larger percentages of white women than black women in higher levels

of education. For example, 10% of black women were college graduates compared to 17% of white women who reached the same education level. Furthermore, 4% of black women have post graduate education in my sample while 9% of white women were at the same level. Conversely, there was a higher percentage of high school dropouts among black women (14%) than white women (8%). Overall, there is a higher percentage of black women in lower levels of education but a higher percentage of white females in higher education levels.

As table 6 also shows, the frequency of having a non-marital child is strikingly different between black and white women. The single moms are predominately in the low end of the educational distribution, but much more so for white women than for black women. Almost all (93%) white single moms are high school dropouts as compared to only 56% of black single moms. As table 6 shows single motherhood is found more in higher education levels for black women suggesting that white women are more likely to wait for marriage to have children. The idea that black women are less likely to wait to have children hints that there is a big difference in the marriage markets that black women face when compared to those white women face.

Table 6 reveals another interesting statistic: 80% of the white female sample reported their parents being together in 1979 whereas only 51% of black females reported the same. This difference could result in different ideas about marriage between the white and black community and therefore could supplement the gap in the racial gap in marriage rates.

## **VI. Probit Results Analysis of Marriage Frequency**

My analysis includes all women in the NLSY79 who reported ever being married and those who were never married by 2006 and who didn't have missing information on the other background variables I used as controls. The coefficients of my background variables were

generally weak and didn't always match my expectations. The coefficients on the year fixed effects did not match my expectations and generally were not very significant. I expected that being born in later years would result in decreased probability than being born in earlier years. Table 7 and 8 show that the partial effects of the time variables don't follow any significant pattern. After testing the joint significance of the birth year effects, I concluded that I couldn't reject the null hypothesis that these coefficients all equal zero for all three samples (the probability that all coefficients equal 0 is 0.62 for the pooled sample, 0.24 for the black sample, and 0.57 for the white sample). I drew the same conclusion for all three samples for the regression on marriage by age 40 (the probability that all coefficients equal 0 is 0.78 for the pooled sample, 0.77 for the black sample, and 0.42 for the white sample).

The coefficients on Mother's education and parents' income play a very minimal role on probability of first marriage for both regressions. The coefficients of the parents together indicator variable matched my expectations for the regressions on marriage by age 40, since all the coefficients were positive although minimal. The coefficients on the region variables didn't meet my expectations since I thought being in the South region would increase the probability of marriage more than living in the other regions. In both regressions, there was no significant pattern for the region coefficients. Since the focus of my paper is the effect of education, I will focus my analysis of the probability of first marriage by age 30 and 40 on the education and non-marital child variables.

#### **A. By Age 30 Excluding Child Variables**

Table 7 shows the partial effects and z-statistics for predicting the probability of marriage by age 30 excluding all child variables. This regression is done under the assumption that the decision to have non-marital child is jointly determined with the decision

to marry. The samples in these regressions include respondents who reported either having been married or never having been married by 2006 and also didn't have missing information for the other variables, therefore the pooled sample is a total of 2,827 women, the black sample is 1,033 women, and the white sample is made up of 1,794 women. As seen in the chi-squared statistics located in the bottom of the table, I can reject the null hypothesis that the coefficients all equal 0 for the pooled and white female sample. However, I am unable to reject the null hypotheses in the black female sample. In spite of this, the difference between the actual and average predicted fraction married is minimal for all three samples indicating that the regressions accurately explain the data. The largest difference is in the pooled sample in which the actual fraction married is 0.739 and the predicted fraction is 0.757 (a difference of 0.018).

In the pooled sample, the effect of race is significantly strong with a decrease in probability of 28 percentage points for being a black female. The education variables reveal that as a woman continues to attain higher levels of education, her probability of marriage by age 30 continually decreases. High school graduates have the greatest probability of getting married with a statistically strong 5.6 percentage point increase while women with post graduate education are the least likely to marry by age 30 as they experience a statistically significant 11.2 percentage point decrease in probability.

Partial effects in the black female only sample suggest that high school dropouts might be the least likely to marry as the effects are all positive. They also are statistically strong for high school graduates (an increase of 12.8 percentage points as compared to the probability of marriage for high school dropouts) and women with some college education (an increase of 10.8 percentage points in comparison to high school dropouts). Additionally,

the absolute value of the effects decreases as the education level climbs so that black women with post graduate education have the smallest increase in chances of marriage by age 30.

In contrast, all the partial effects on education for the white female sample suggest that high school dropouts are the most likely to marry by age 30 as the effects are negative and statistically significant for college graduates (a decrease of 11.1 percentage points) and women with post graduate education (the biggest decrease of the education variables with 20.5 percentage points). The absolute value of these partial effects increases as the education level climbs estimating that white women with post graduate education have the worst chances of marriage by age 30 in the white female sample.

### **B. By Age 30 with Child Variables**

Table 7 also reveals the estimated partial effects and z-statistics for predicting the probability of marriage by age 30 including child variables. The motivation behind this regression is to analyze, separately, the effects a non-marital child has on the probability of marriage by age 30. My samples included all female respondents who reported either having been married or never having been married by 2006 and also didn't have missing information on the child variables. This resulted in a total of 2,786 females in the pooled sample, 1014 in the black female sample, and 1769 in the white female sample. As seen by the chi-squared statistics located at the bottom of the table, I was able to reject the null hypothesis that all the coefficients of the independent variables are 0 for all three samples. Further indicating that the regression is an accurate fit, the differences between the actual fraction of females married by age 30 in each sample and the predicted fraction, using the predicted coefficients of the probit estimate and the averages of each independent variable, were small; the biggest

case being that of the pooled sample with 0.743 as the actual fraction and 0.769 as the predicted fraction (a difference of 0.26).

Overall, the coefficients for the education variables were what I expected as they all decreased the probability of marriage and also the effect increased in magnitude as the education level increased. The coefficients on the child before marriage variable were also consistent with my expectations as having a child decreases the chances of marriage by age 30 for both races. I expected that the coefficient for the male non-marital child variable would be positive but a male child only increased the likelihood of marriage for the white female sample. The interaction variables between non-marital child before marriage and education levels all had positive coefficients which was consistent with what I predicted.

Table 7 shows the partial effects from my probit regression on the pooled and stratified samples. In the pooled sample, race has a significant effect on being married by age 30 with an 18 percentage point decrease in probability if the respondent is black. This result from my dataset parallels the empirical evidence that being a black female reduces the probability of marriage resulting in the racial gap in marriage rates. A female's education level also had significant effects on being married by age 30. The partial effects are comparisons in probability to female high school dropouts. Being a high school graduate decreased the likelihood of marriage by 9.5 percentage points, some college education decreased the chances by 14 percentage points, being a college graduate decreased the probability by 25 percentage points and having post graduate education decreased the chances by 35 percentage points. As the education level increases, the magnitude of the decrease in probability grew larger as well, resulting in women with more than 4 years of college as having the worst likelihood of marrying by age 30.

In addition, having a child before marriage decreases a woman's probability of first marriage by age 30 by 42 percentage points and this was significant at a 0.001 level. However, the partial effects show that having a non-marital child while being at a high school graduate and above education level increases the probability of marriage by approximately 15 percentage points, as compared to high school dropouts with a non-marital child. This suggests that the large decrease in probability of marriage for those with a non-marital child might be attributed to high school dropouts with a non-marital child.

The pooled sample regression is presented for completeness, but I am going to focus mainly on the partial effects for the black only and white only samples. Table 7 shows a similar pattern for both races: as education increases, the chances of marriage by age 30 decreases. Interestingly, the partial effects of the education level variables for the white cohort are larger than those for the black females with the exception of that for females with some college education for which are similar (-12.4 percentage points for black females and -12.6 percentage points for white females).

The partial effect for the non-marital child variable was statistically significant for both races but again, larger for white females than black (-38 percentage points for black females and -47 percentage points for white females). Simultaneously, having a male child appears to increase the probability of marriage for white females by 6.9 percentage points while the same decreases the probability of marriage for black females by 6.3 percentage points.

For a black woman who had a non-marital child, the probability of marriage by age 30 increases as her education level increases. For example, compared to a high school dropout, a woman's chances of marriage increase by 16 percentage points for a black female



with a high school education but increase by a statistically significant 27 percentage points for a black female with post graduate education. The same is true for white women who had a non-marital child: the probability of marriage increases as her education level rises from high school graduate (a statistically significant increase of 9.2 percentage points) to some college (a statistically significant increase of 11.2 percentage points). Due to a relatively small number of white women with higher levels of education who also have a child, the regression predicted a perfect failure for these groups and therefore Stata was unable to report a coefficient for these interaction variables.

### **C. By Age 40 Excluding Child Variables**

Table 8 presents the partial effects predicting the probability of marriage by age 40 excluding child variables, due to the argument that women make a joint decision between having a child and marrying. Because of the higher age, this sample includes women who didn't have time marry by the age 30 cutoff but married by age 40 and also gave time for most women to complete their education. These samples of women are different because I used a different education variable to determine the highest grade completed by age 40 which may have included more individuals who had missing information on other variables used in the regression. The pooled sample consists of 2,064 women, the black sample is 828 women, and the white sample is 1,236 women. As seen in the Chi-squared statistics located at the bottom of the table, the null hypotheses that all the estimated coefficients equal 0 can be rejected for the pooled and black female only samples at a significance level of 0.05 and for the white female only sample at a significance level of 0.1. Furthermore, the differences between the actual and predicted fraction married are very close indicating that the regression

is a good fit. The largest discrepancy is in the pooled sample as the actual fraction married is 0.821 but the average predicted fraction is 0.854 (a difference of 0.033).

In the pooled sample, race has a larger effect on probability of marriage when child variables aren't controlled for as being black reduces the likelihood by a statistically significant 23 percentage points. The education variables are all statistically strong and positive suggesting that high school dropouts are the least likely to marry. Women with post graduate education follow behind high school dropouts with the smallest increase in probability (an increase of 6.9 percentage points) indicating that women at the high school dropout and post graduate education levels are the most in danger of not being married by age 40. College graduates and women with some college education have similar increases in probabilities of marriage (10.4 percentage point increase for some college and 10.6 percentage point increase for college graduates) and are the most likely to marry in this sample.

Consistent with the result in the pooled sample, high school dropouts are the least likely to marry in both the black and white samples. Since the coefficients are positive for all levels of education, the probabilities of marriage are all greater than that for high school dropouts. College graduates have the biggest increase in probability of marriage for black women with a statistically significant 21.6 percentage points. Education has less of an effect for white women rather than black women at all levels. The largest increase in this sample was among women with some college who experience a statistically significant increase of 7.1 percentage points.

As the pooled sample predicted, women with post graduate education is another group with a low likelihood of marriage and this appears to be particularly true in the white

female sample. Although this result was weak, white women with post graduate education have the smallest increase in probability of marriage (an increase of only 2.4 percentage points) in this sample. Conversely, black females who attained the same education level experienced the second largest increase in probability of marriage (a statistically significant increase of 19.7 percentage points).

These findings suggest that the decision to increase education has a mildly adverse effect on the likelihood of marriage within the white sample but a positive effect for black women.

#### **D. By Age 40 with Child Variables**

Table 8 also presents the partial effects and z-statistics for predicting the probability of marriage by age 40. A total of 3,163 females were used in the pooled sample, 1,117 in the black female sample, and 2,046 in the white female sample. The number of observations in each sample differs from the numbers used in the regressions without child variables because respondents who had missing information for the child variables in the NLSY79 dataset were excluded. Table 8 shows by the Chi-squared statistics located towards the bottom that the null hypothesis that all the independent variables equal 0 is rejected therefore my probit regressions predicting probability of marriage by age 40 for all three samples are significant at a 0.05 level. Additionally, the average predicted fraction is close to the actual fraction of women married for each sample, further indicating that the regression is a good fit. The biggest difference between the fraction of females married by age 40 and the predicted fraction, using the coefficients of the probit estimate and the averages of each independent variable, was in the probit on the pooled sample with 0.829 as the actual fraction married and 0.864 as the predicted fraction (a difference of 0.035).

The pooled sample shows that a black female faces a statistically significant decrease of 17 percentage points in the like likelihood of marriage, which has less of an effect than race exerted on the probability of marriage by age 30. My education variables for both races pooled together were generally weak and failed to follow a distinct pattern but the group with the worst likelihood of marriage is for women with post graduate education (this group experiences a probability of marriage that is 1.8 percentage points less than that of high school dropouts).

On the other hand, the partial effect on the non-marital child variable is statistically strong showing a decrease of 20 percentage points in the probability of marriage. This partial effect is markedly different from that in the married by 30 regression on the pooled sample (a decrease of 42 percentage points). This suggests that for all women, a non-marital birth has less of an effect on chances of marriage by age 40 than by age 30. Compared to high school dropouts with a non-marital child, women who have a non-marital child and also attain higher levels of education have a greater chance of marriage, but these effects were generally small and statistically weak, with the exception of college graduates who also had a non-marital child (these women experience a statistically greater probability of marriage by 8.9 percentage points than high school dropouts). While these effects have the same sign, they are different from those shown for the same interaction variables in the pooled regression for marriage by age 30 which all had statistically strong increases in probability.

Table 8 presents interesting partial effects of the education variables when focusing on the stratified samples. In the white female sample, there is no clear pattern for the partial effects of the education variables. Consistent with the results on the regressions excluding child variables, high school dropouts and women with post graduate education have the worst

probability of marriage by age 40 while white women with some college education have the highest probability of marriage (a statistically significant 6.3 percentage point increase in probability in comparison to high school dropouts). Education appears to have a larger effect on the probability of marriage by age 40 for the black sample. Although there is no distinct pattern, all of the partial effects are negative signaling that high school dropouts have the worst chance of marriage. The smallest effect is for post graduate educated women (a decrease in probability of 15.8 percentage points) while the largest effect is for women with some college (a decrease in probability of 22.2 percentage points). This finding suggests that among black women, being a high school graduate or having a post graduate education increases the likelihood of marriage by age 40 which is different from the finding that having a post graduate education significantly decreases your chances of marriage by age 30. .

Another notable difference from the regression on marriage by age 30 is that black females with a non-marital child have a larger decrease in probability than the females in the white sample (a statistically strong decrease of 41.9 percentage points for black women and a decrease of 16.2 percentage points for white women). However, white women with a male child increase their probability by a statistically significant 4.9 percentage points while a male child seems to decrease the probability for black women by 5.4 percentage points, which is consistent with the results of the regression on age 30.

Furthermore, table 8 shows that the partial effects of the interaction variables for the black female sample tell a similar story as that told in the married by 30 regression. For a black woman who had a non-marital child, the probability of marriage by age 40 increases as she attains more than a high school dropout education level. While these partial effects illustrate a statistically significant increase in probability of marriage for higher levels of

education if a non-marital child is present, the partial effects on these same variables were weak for white females. In general, white women with a non-marital child and higher levels of education have higher decreases in the probability of marriage in comparison to women with lower levels. For example, white women with post graduate education experience a decrease of 48.8 percentage points in probability of marriage while high school graduates experience an increase of 2.4 percentage points. An interesting fact found upon further investigation reveals disproportionate numbers of women who had a child before marriage and had higher levels of education between the races. For example, there were 29 women in the black sample who were college graduates with a non-marital child whereas there were only 2 white women who reported the same characteristics. Additionally, while there were only 8 black women who reported having a post graduate education level and a non-marital child, there were only 2 white women who reported the same. These statistics might be a possible clue as to why the estimated partial effects on the interaction variables are insignificant for white females: there are too few respondents in the white community who fulfill these interaction variables at higher levels of education for a significant effect to be estimated.

## **VII. Conclusions for Marriage on Age 30 and Age 40**

The purpose of my paper was to find evidence among women with higher education attainment levels that is consistent with Becker's economic theory on marriage. I predicted that due to a disproportionate number of women to men at higher education levels, marriage would be less likely for these groups of women because their individual gains would exceed the joint production they would receive with men of lesser quality. I used two different models (one excluding child variables and the other including these variables) to analyze the

effect of education on the probability of marriage by age 30 and then by age 40 on a pooled sample and then samples stratified by race.

My results for the regression excluding the child variables more accurately reflect the probability of marriage since the decision to have a non-marital child is intermixed with the decision to get married. These decisions are intimately related because they are generally driven by the same unobservable characteristics such as family background and what life opportunities are available with to these women. According to this view, non-marital child shouldn't be an explanatory variable. As my results for these regressions illustrate for both races, the probability of marriage by 30 decreases as education increases resulting in post graduate educated women of both races having lower probabilities of being married by this age. The results for my regressions controlling for non-marital child variables also indicate that higher levels of education result in lower likelihoods of marriage. This is consistent with my prediction and a likely explanation for this finding is that women may not have yet completed the level of education desired and therefore delay marriage.

When looking at the probability of marriage by age 40 in the regressions excluding non-marital child variables, high school dropouts are the least likely to marry for both races. Interestingly, in both regression models, white women with post graduate education have one of the lowest probabilities of marriage within their community but black women of the same education level have one of the highest probabilities of marriage by age 40.

In summary, black women who chose to increase their education level generally delay marriage until after age 30 but increase their overall chances of marriage by age 40. Conversely, white women who chose to increase their education level also experience a delay in marriage but ultimately experience an overall decrease in their likelihood of marriage by

age 40 in comparison to those less educated in their community. My prediction was incorrect and the adverse effect of higher education on marriage that I thought I would find in the black community, I actually found in the white community in the NLSY dataset. These findings are significant as they confirm that less educated black females are usually the most affected by the marriage gap. Although there is a general scarcity in black males, black women at higher levels of education seem to have access to other marriage opportunities from which the less educated are excluded.

Some caveats should be included in this discussion section. For the purposes of this study, I limited my definition of Becker's concept of "quality" as corresponding to a person's education level. I assumed that people of the same quality generally had equivalent education levels, but my results appear to contradict my prediction. Thus, this might have been an incorrect assumption. In addition to this defect, I had to exclude respondents who skipped questions which could lead to an inaccurate representation of the effects certain variables actually have on the probability of marriage. Also, because there wasn't a variable that matched education level at age of first marriage, I had to pick the highest grade completed for specific years to capture the females' education levels when they were in the relevant age group. This also could have led to some inaccurate results. Another source of inaccuracy was my inability to obtain geographic information which hindered my capability of determining the sex ratios in the marriage market.

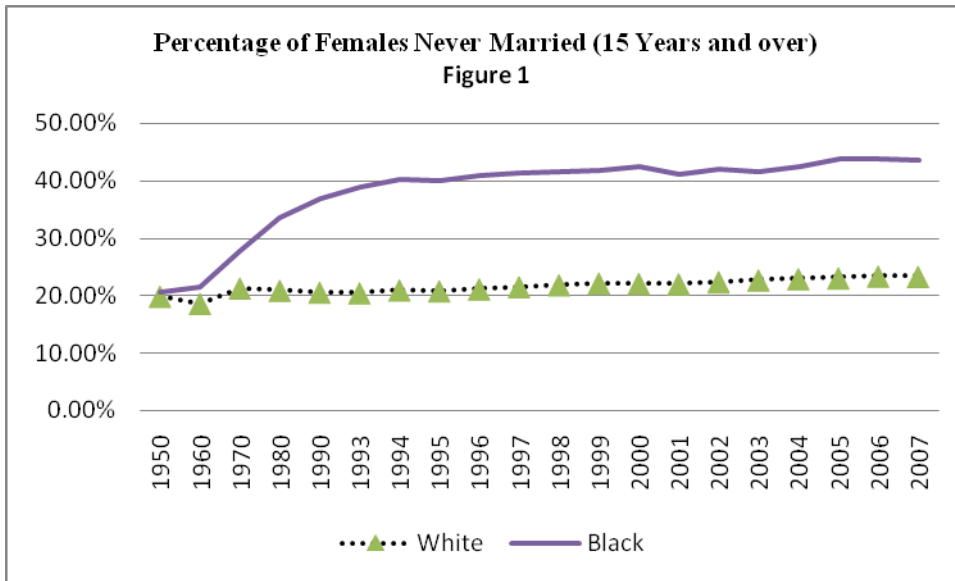
In future research, I would like to further examine how Becker's economic theory applies to women with higher education levels. I would like to open my definition of who constitutes a "high quality" mate in order to have a more accurate representation of the sex ratios in the different marriage markets. By examining what high quality women consider a



“high quality” husband could allow me to construct a marriage market that includes all of the possible men considered in a “high quality” marriage market.

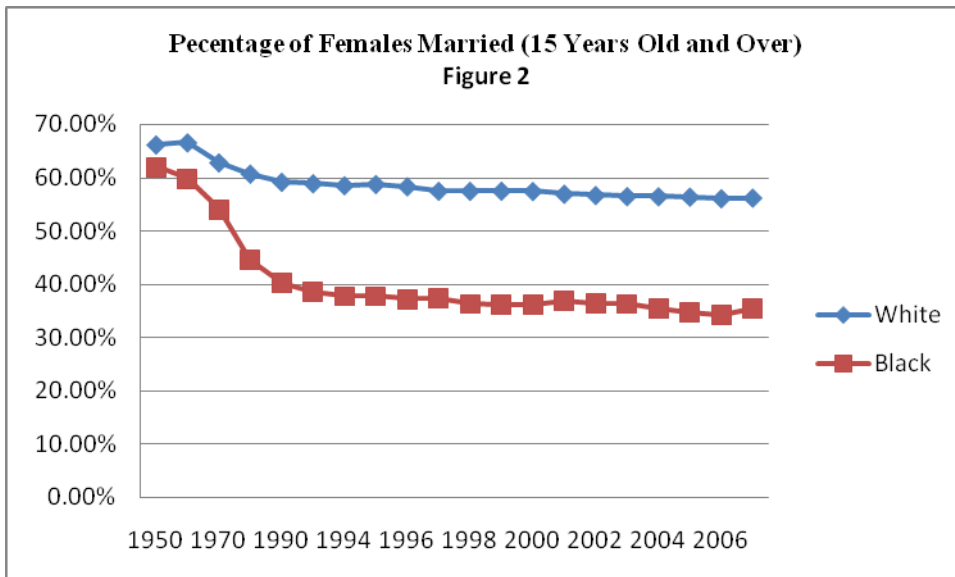
An interesting finding in my regression including non-marital child variables that I think merits future research was the statistically significant decrease in probability in marriage by age 30 and 40 for women with a non-marital child that was mitigated by higher education attainment levels. Examining possible reasons behind this discovery could reveal the connection between non-marital children and the probability of marriage, as well as how these effects differ between the black and white communities. Additionally, the development of a specific model that accurately tests the simultaneity of decisions regarding fertility and marriage would be a necessary piece in the pursuit of reasons behind the racial marriage gap. While I think this would be extremely important, this initiative was beyond the scope of this paper and requires future research.

## Tables and Figures



Source: U.S Census Bureau, Current Population Survey, 2007, Author's Calculation

<http://www.census.gov/population/socdemo/hh-fam/ms1.pdf>

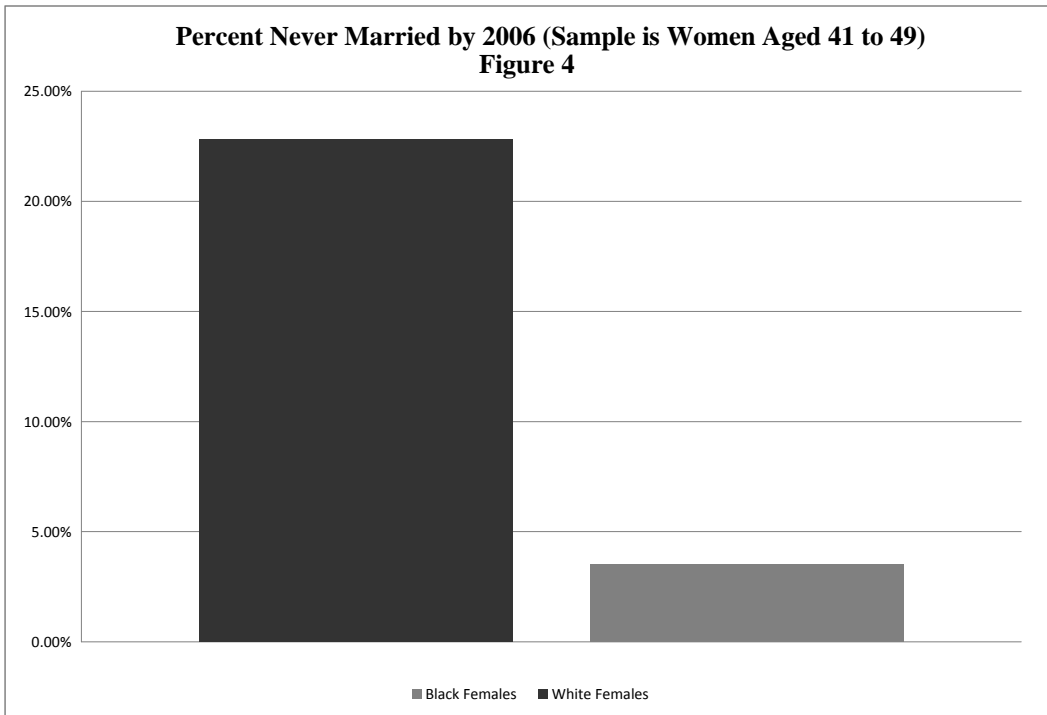


Source: U.S Census Bureau, Current Population Survey, 2007, Author's Calculation

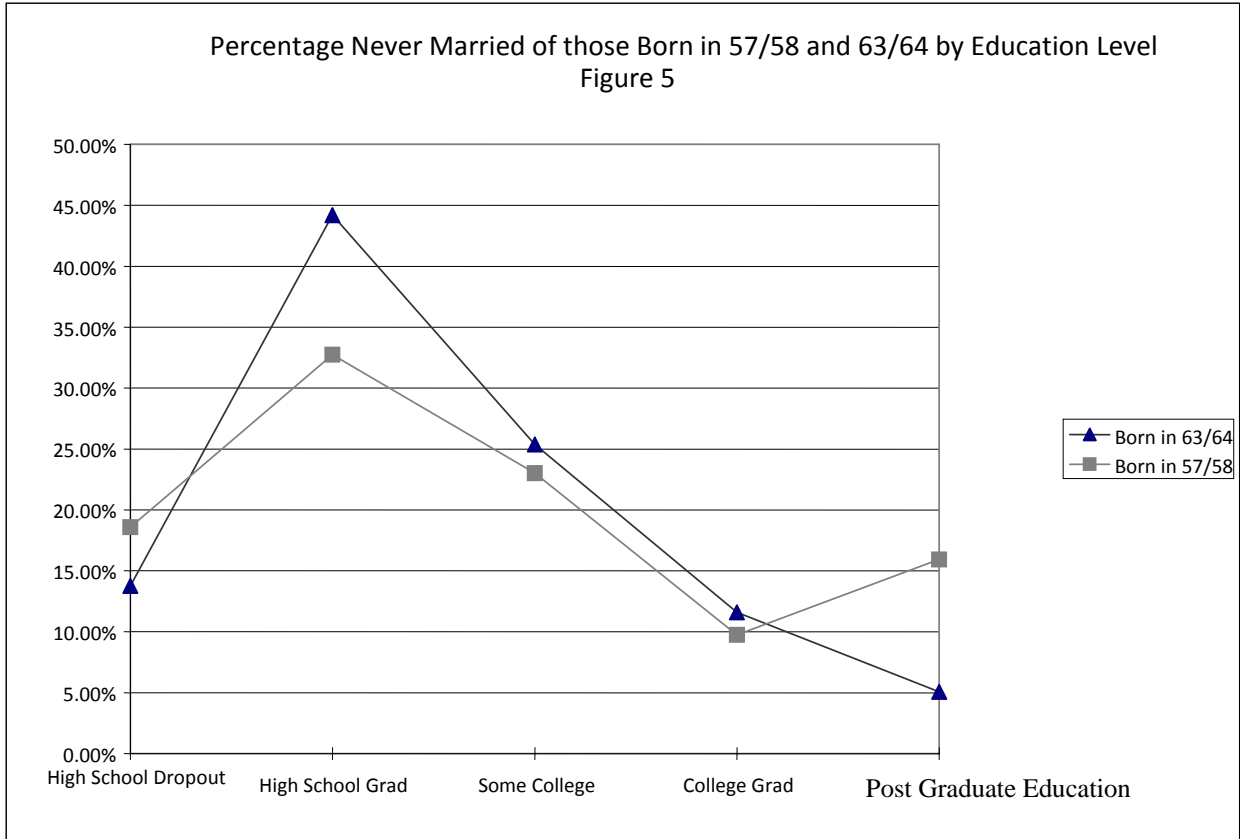
<http://www.census.gov/population/socdemo/hh-fam/ms1.pdf>



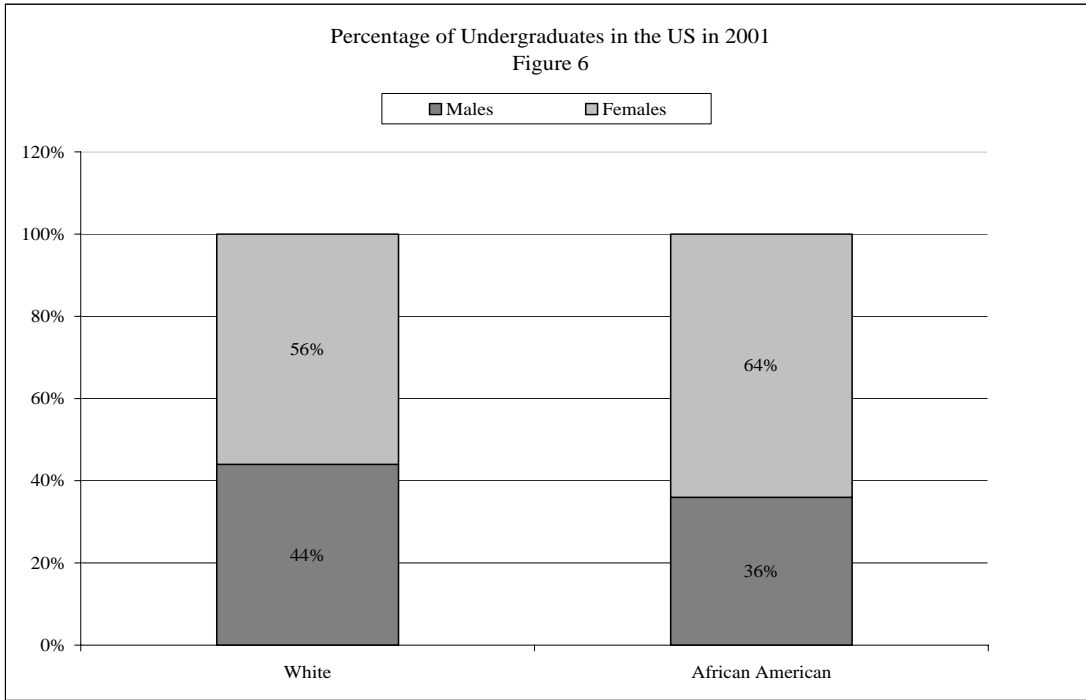
Source: NLSY 79 Data, Author's Calculation



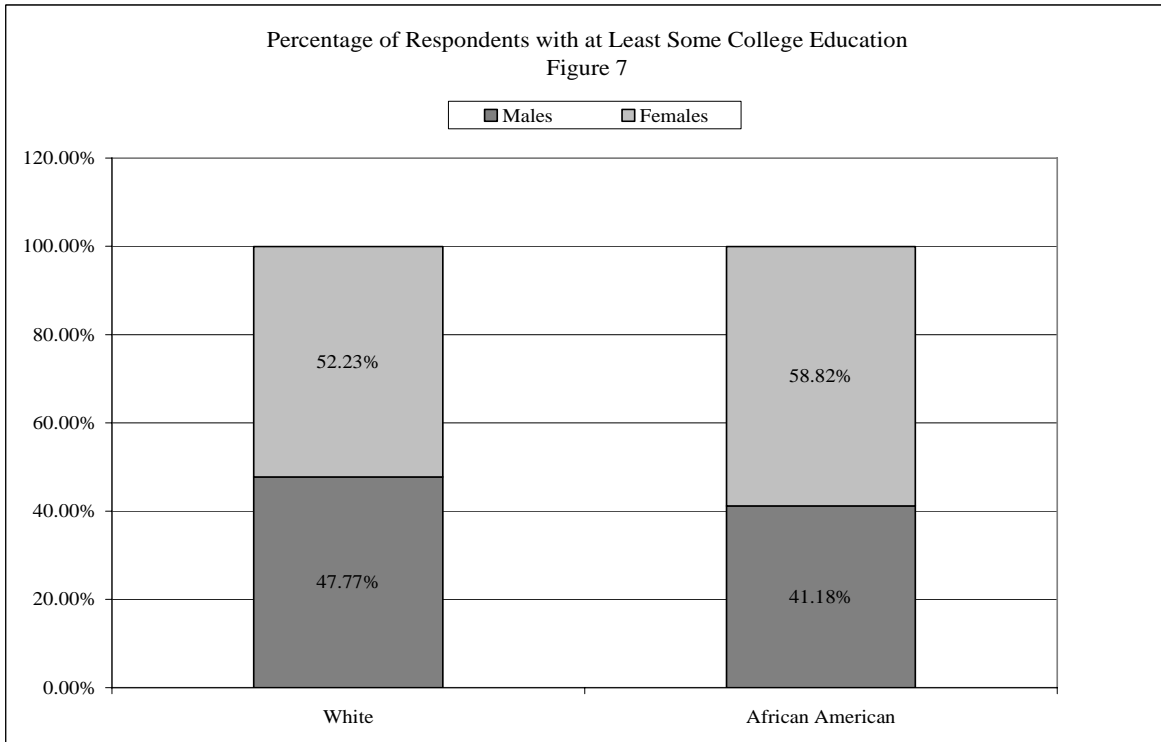
Source: NLSY79 Data, Author's Calculation



Source: NSLY79 Data, Author's Calculation



Source: U.S. Department of Education, National Center for Education Statistics



Source: NSLY79 Data, Author's Calculation

Table 1: Of those married by 2006, Average Age of First Marriage by Education Level\*

	Black Females				White Females			
	Mean	SD	Min	Max	Mean	SD	Min	Max
High School Dropout	23.89	7.43	13	43	19.94	4.97	14	42
High School Graduate	24.01	6.25	13	45	21.74	5.33	13	48
Some College	25.21	5.92	15	44	23.26	4.82	15	42
College Graduate	26.60	6.17	19	45	25.64	4.76	16	40
Post Graduate Education	27.21	5.33	18	43	26.35	5.38	18	44

\* Using NLSY79 Data

Table 2: Average Age of First Marriage of Women Without Non-Marital Child by Education Level \*

	Black Females				White Females			
	Mean	SD	Min	Max	Mean	SD	Min	Max
High School Dropout	18.6	4.18	13	27	18.5	3.47	14	30
High School Graduate	21.3	4.45	13	38	21.3	4.73	13	44
Some College	23.7	5.06	16	44	22.7	4.65	15	42
College Graduate	25.7	5.27	16	45	25.6	4.76	16	40
Post Graduate Education	27.2	4.45	18	35	26.2	5.23	18	44

\* Using NLSY79 Data

Table 3: Percent Never Married by Education of those Never Married by 2006\*

	Black Females	White Females
	High School Dropout	17.95%
High School Graduate	42.15%	34.12%
Some College	26.97%	18.68%
College Graduate	7.59%	20.22%
Post Graduate Education	5.34%	20.16%
Total	100.00%	100.00%

\* Using NLSY79 Data

Table 4: Facts on First Marriage of those Married by 2006 Using NLSY79 Data

	Black Females	White Females
% Married by 30	84.23%	93.30%
% Married by 40	98.17%	99.50%
Median Age of First Marriage	23	21
Mean Age of First Marriage	24.19	22.14
% With Non-Marital Child	26.46%	4.46%

Table 5: Average Husband's Level of Education by Female's Education Level\*

	Black Females'	White Females'
	Husbands	Husbands
High School Dropout	10.9	11.6
High School Graduate	11.5	12.0
Some College	12.6	13.3
College Graduate	14.2	15.3
Post Graduate Education	13.3	15.5

\* Using NLSY79 Data

Table 6: Means and Standard Deviations Using NLSY 79 Data

Variables	Pooled		Black Females		White Females		Min	Max
	Mean	SD	Mean	SD	Mean	SD		
High School Dropouts (Reference Group)	0.10	0.30	0.14	0.34	0.08	0.27	0	1
High School Graduate	0.44	0.50	0.43	0.49	0.44	0.50	0	1
Less than 4 years of College	0.25	0.43	0.30	0.46	0.22	0.42	0	1
College Graduates	0.14	0.35	0.10	0.30	0.17	0.37	0	1
Post Graduate Education	0.07	0.26	0.04	0.19	0.09	0.28	0	1
Non-Marital Child	0.26	0.44	0.55	0.50	0.09	0.29	0	1
Male Child Present	0.13	0.34	0.28	0.45	0.05	0.21	0	1
Less than HS Grad and Child (Reference Group)	0.79	0.40	0.56	0.50	0.93	0.25	0	1
High School Grad and Child	0.13	0.34	0.27	0.44	0.05	0.22	0	1
Some College and Child	0.06	0.24	0.14	0.35	0.02	0.13	0	1
College Grad and Child	0.01	0.10	0.02	0.16	0.00	0.00	0	1
Post Graduate Education and Child	0.00	0.06	0.01	0.08	0.00	0.00	0	1
Mother's Education	11.41	2.59	10.60	2.63	11.87	2.45	0	20
Parents' Income in 1979*	1.28	14.72	0.848	10.35	1.53	16.13	0	7.5001
Parents Together in 1979	0.69	0.46	0.51	0.50	0.80	0.40	0	1
Born in 1957	0.11	0.31	0.09	0.29	0.11	0.32	0	1
Born in 1958	0.11	0.31	0.10	0.29	0.11	0.32	0	1
Born in 1959	0.12	0.32	0.14	0.34	0.11	0.31	0	1
Born in 1960	0.14	0.35	0.13	0.34	0.14	0.35	0	1
Born in 1961	0.14	0.35	0.14	0.35	0.15	0.36	0	1
Born in 1962	0.14	0.35	0.15	0.36	0.14	0.34	0	1
Born in 1963	0.13	0.33	0.13	0.34	0.13	0.33	0	1
Born in 1964 (Reference)	0.11	0.31	0.12	0.32	0.11	0.31	0	1
Northeast Region (Reference)	0.19	0.39	0.18	0.38	0.19	0.39	0	1
North Central Region	0.29	0.45	0.31	0.46	0.28	0.45	0	1
South Region	0.39	0.49	0.38	0.49	0.40	0.49	0	1
West Region	0.13	0.34	0.14	0.34	0.13	0.33	0	1
N	2786		1014		1769			

\* (in ten thousands)

Table 7: Partial Effects Predicting the Probability of Marriage by Age 30<sup>1</sup>

	Pooled		Black Females		White Females	
	Child Variables	No Child Variables	Child Variables	No Child Variables	Child Variables	No Child Variables
Fraction Married	0.743	0.739	0.573	0.567	0.842	0.837
Average Predicted Fraction	0.769	0.757	0.579	0.568	0.855	0.844
<i>Difference</i>	0.026	0.018	0.006	0.001	0.013	0.007
Constant						
Race	-0.184** (-8.49)	-0.280** (-14.31)				
<b><i>Education Variables</i></b>						
High School Dropout			(Reference Group)			
High School Graduate	-0.095* (-1.77)	0.056* (1.91)	-0.035 (-0.31)	0.128** (2.58)	-0.094* (-1.76)	-0.013 (-0.34)
Some College	-0.141** (-2.27)	0.048 (1.56)	-0.124 (-1.07)	0.108** (2.01)	-0.126* (-1.84)	-0.014 (-0.34)
College Graduate	-0.250** (-3.57)	-0.020 (-0.53)	-0.174 (-1.43)	0.104 (1.62)	-0.254** (-3.08)	-0.111** (-2.08)
Post Graduate Education	-0.354** (-4.69)	-0.112** (-2.27)	-0.238* (-1.81)	0.068 (0.76)	-0.355** (-3.77)	-0.205** (-3.05)
<b><i>Child Variables</i></b>						
Non-Marital Child	-0.421** (-6.00)		-0.380** (-3.78)		-0.470** (-4.00)	
Male Non-marital Child	-0.021 (-0.70)		-0.063 (-1.48)		0.069** (2.12)	
<b><i>Education and Child Interaction Variables</i></b>						
High School Dropout and Non-marital Child			(Reference Group)			
High School Graduate and Non-marital Child	0.152** (3.62)		0.161 (1.38)		0.092** (2.20)	
Some College and Non-Marital Child	0.157** (4.13)		0.188* (1.71)		0.112** (3.39)	
College Graduate and Non-Marital Child	0.152** (3.11)		0.186 (1.43)			
Post Graduate Education and Non-Marital	0.161** (2.49)		0.269* (1.87)			
<b><i>Background Variables</i></b>						
Mother's Education	0.001 (0.35)	0.002 (0.42)	0.000 (0.01)	0.001 (0.14)	0.001 (0.29)	0.002 (0.54)
Parents' Income in 1979	-0.004 (-0.65)	-0.004 (-0.70)	-0.002 (-0.11)	-0.001 (-0.07)	-0.001 (-0.26)	-0.002 (-0.44)
Parents Together in 1979	-0.003 (-0.14)	0.014 (0.70)	0.029 (0.88)	0.053 (1.63)	-0.029 (-1.36)	-0.023 (-1.05)



(Table 7 Continued)

<b>Time Effects</b>						
Born in 1957	0.050 (1.54)	0.050 (1.52)	0.117* (1.80)	0.110* (1.69)	0.010 (0.28)	0.011 (0.29)
Born in 1958	0.028 (0.82)	0.015 (0.44)	0.097 (1.46)	0.056 (0.84)	-0.014 (-0.36)	-0.008 (-0.21)
Born in 1959	0.048 (1.53)	0.031 (0.95)	0.144** (2.46)	0.125** (2.14)	-0.014 (-0.35)	-0.028 (-0.70)
Born in 1960	-0.003 (-0.10)	-0.010 (-0.30)	0.058 (0.94)	0.040 (0.65)	-0.042 (-1.08)	-0.043 (-1.09)
Born in 1961	0.012 (0.38)	0.004 (0.12)	0.065 (1.07)	0.036 (0.59)	-0.024 (-0.67)	-0.022 (-0.58)
Born in 1962	0.032 (1.03)	0.031 (0.98)	0.066 (1.10)	0.066 (1.11)	0.003 (0.08)	0.005 (0.14)
Born in 1963	0.020 (0.61)	0.019 (0.58)	0.147** (2.56)	0.135** (2.33)	-0.056 (-1.37)	-0.048 (-1.19)
Born in 1964	(Reference Group)					
<b>Region Effects</b>						
Northeast Region	(Reference Group)					
North Central Region	-0.054** (-2.03)	-0.043* (-1.66)	-0.051 (-1.03)	-0.052 (-1.11)	-0.057* (-1.94)	-0.036 (-1.27)
South Region	-0.044* (-1.74)	-0.029 (-1.17)	-0.067 (-1.38)	-0.048 (-1.03)	-0.030 (-1.15)	-0.014 (-0.56)
West Region	-0.043 (-1.28)	-0.040 (-1.21)	0.025 (0.41)	0.008 (0.14)	-0.085** (-2.11)	-0.074* (-1.89)
N	2786	2827	1014	1033	1769	1794
Chi <sup>2</sup>	386.62	280.00	87.76	23.17	85.85	46.02
p	0.00	0.00	0.00	0.14	0.00	0.00

\* p&lt;0.10, \*\*p&lt;0.05

¹Z-statistics are shown in parentheses

Table 8: Partial Effects Predicting the Probability of Marriage by Age 40<sup>1</sup>

	Pooled		Black Females		White Females	
	Child Variables	No Child Variables	Child Variables	No Child Variables	Child Variables	No Child Variables
Fraction Married	0.829	0.821	0.675	0.664	0.928	0.926
Average Predicted Fraction	0.864	0.854	0.685	0.671	0.939	0.933
<i>Difference</i>	0.035	0.033	0.01	0.007	0.011	0.007
Constant	(There are no partial effects on constants)					
Race1 (d)	-0.171** (-7.55)	-0.230** (-10.95)				
<b>Education Variables</b>						
High School Dropout	(Reference Group)					
High School Graduate	0.003 (0.04)	0.073** (2.29)	-0.188 (-0.88)	0.104 (1.60)	0.036 (0.97)	0.049 (1.63)
Some College	0.024 (0.38)	0.104** (3.63)	-0.222 (-1.00)	0.155** (2.36)	0.063** (2.34)	0.071** (3.06)
College Graduate	0.021 (0.33)	0.106** (4.25)	-0.166 (-0.70)	0.216** (3.84)	0.036 (1.12)	0.046* (1.82)
Post Graduate Education	-0.018 (-0.25)	0.069** (2.24)	-0.158 (-0.64)	0.197** (3.13)	0.018 (0.50)	0.024 (0.77)
<b>Child Variables</b>						
Non-Marital Child	-0.200** (-2.04)		-0.419** (-2.39)		-0.162 (-1.15)	
Male Non-marital Child	-0.018 (-0.66)		-0.054 (-1.17)		0.049** (3.24)	
<b>Education and Child Interaction Variables</b>						
High School Dropout and Non-marital Child	(Reference Group)					
High School Graduate and Non-Marital Child	0.065 (1.18)		0.264 (1.58)		0.024 (0.51)	
Some College and Non-Marital Child	0.070 (1.37)		0.299** (2.41)		-0.009 (-0.11)	
College Graduate and Non-Marital Child	0.089** (2.00)		0.275** (3.46)		-0.089 (-0.46)	
Post Graduate Education and Non-Marital Child	0.050 (0.69)		0.243** (2.21)		-0.488 (-1.30)	
<b>Background Variables</b>						
Mother's Education	-0.006* (-1.80)	-0.007** (-2.07)	-0.007 (-0.98)	-0.010 (-1.43)	-0.007** (-1.99)	-0.006 (-1.60)
Parents' Income in 1979	0.019** (2.43)	0.020** (2.57)	0.039* (1.91)	0.046** (2.29)	0.010* (1.79)	0.009 (1.48)
Parents Together in 1979	0.012 (0.65)	0.021 (1.09)	0.008 (0.23)	0.015 (0.43)	0.012 (0.63)	0.020 (0.96)
<b>Time Effects</b>						
Born in 1957	-0.071	-0.084	-0.114	-0.120	-0.052	-0.056

Born in 1958	(-1.36)	(-1.55)	(-1.14)	(-1.22)	(-0.94)	(-0.99)
	-0.033	-0.045	-0.066	-0.074	-0.019	-0.020
	(-0.79)	(-1.05)	(-0.79)	(-0.91)	(-0.46)	(-0.48)
Born in 1959	-0.057	-0.066*	-0.000	-0.018	-0.123**	-0.108**
	(-1.46)	(-1.66)	(-0.01)	(-0.26)	(-2.15)	(-2.01)
Born in 1960	-0.027	-0.036	-0.022	-0.017	-0.043	-0.052
	(-0.81)	(-1.07)	(-0.32)	(-0.26)	(-1.16)	(-1.35)
Born in 1961	-0.009	-0.014	-0.021	-0.023	-0.015	-0.010
	(-0.30)	(-0.47)	(-0.34)	(-0.39)	(-0.51)	(-0.33)
Born in 1962	0.001	-0.008	0.031	0.026	-0.035	-0.036
	(0.02)	(-0.26)	(0.52)	(0.44)	(-1.03)	(-1.04)
Born in 1963	0.010	0.013	0.089	0.095*	-0.044	-0.040
	(0.36)	(0.47)	(1.58)	(1.72)	(-1.26)	(-1.15)
Born in 1964			(Reference Group)			
<b>Region Effects</b>						
Northeast Region			(Reference Group)			
North Central Region	-0.033	-0.026	-0.014	-0.014	-0.055*	-0.039
	(-1.22)	(-0.96)	(-0.26)	(-0.26)	(-1.82)	(-1.39)
South Region	-0.025	-0.024	-0.001	-0.004	-0.034	-0.030
	(-1.01)	(-0.96)	(-0.02)	(-0.07)	(-1.42)	(-1.24)
West Region	-0.007	-0.010	0.107*	0.080	-0.091*	-0.082*
	(-0.21)	(-0.33)	(1.81)	(1.34)	(-1.94)	(-1.86)
N	1992	2064	778	828	1214	1236
chi2	274.80	265.59	55.60	36.16	44.49	25.10
p	0.00	0.00	0.00	0.00	0.01	0.09

\* p<0.10, \*\* p<0.05

<sup>1</sup>Z-statistics are shown in parentheses

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