Early Parenthood and Educational Trajectories: A Comparison of Men and Women

Frank W. Heiland[*], Heinrich Hock[†], and William John Thrasher[‡]

September 21, 2009

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Abstract

While the negative consequences of teenage motherhood are well-documented, only a handful of studies have investigated the costs of early fatherhood. Using data from the NLSY79, we provide new estimates of the relationship between early parenthood and educational outcomes, considering high school and college completion, in addition to a continuous measure of completed schooling. Our study is the first to present estimates for both men and women obtained from a comparable statistical model, enabling us to investigate potential gender differences in the average education penalty associated with early parenthood. Our results suggest that, controlling for individuals' scholastic endowments and detailed family background characteristics, men face lower consequences of early fertility across the adolescent educational spectrum. Gender differences are also most pronounced during the early teenage years. Ongoing work that explicitly accounts for additional unobserved individual characteristics will examine the heterogeneous educational effects of early-lifecycle fertility in greater detail.

Keywords: early parenthood, teenage pregnancy, fertility, education, human capital formation

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[*]CUNY Institute for Demographic Research, School of Public Affairs, City University of New York, Baruch College, New York, NY 10010. Phone: 646-660-6868. Fax: 646-660-6871. Email: frank.heiland@baruch.cuny.edu. Center for Demography and Population Health and Department of Economics, Florida State University, Tallahassee, FL 32306-2240.
[†] Mathematica Policy Research, 600 Maryland Ave SW, Suite 550, Washington, DC 20024-2512. Phone: 202-250-3557. Fax: 202-863-1763. Email: hhock@mathematica-mpr.com
[‡] Center for Demography and Population Health, Florida State University, Tallahassee, FL 32306-2240. Email: wjt1321@fsu.edu

Introduction

The literature devoted to analyzing the causes and consequences of female fertility is vast. Perhaps motivated by the ultimate implications for child well being, the potentially negative effects of early, unintended childbearing on subsequent socioeconomic outcomes of females is a topic that has received substantial attention. Much of this research has found evidence of sizeable reductions in educational attainment attributable to early motherhood (Fletcher and Wolfe, 2009; Geronimus and Korenman 1992; Hofferth, Reid, and Mott 2001; Hoffman, Foster, and Furstenberg, 1993; Klepinger, Lundberg, and Plotnick 1995 and 1999).[1] Research on the consequences of early fatherhood has been, by contrast, scant. We are aware of only three studies that consider the relationship between early fatherhood and educational outcomes: Brien and Willis (1997), Marsiglio (1987), and Pirog-Good (1996). No research to date has produced estimates of the parenthood penalty that may be compared across genders.

In this paper, we present new estimates of the relationship between early fatherhood and male educational attainment. Like the existing research, we use data from the 1979 National Longitudinal Survey of Youth (NLSY79). Our analysis builds on prior work by examining a broader array of educational outcomes and by using statistical methods that better control for confounding individual-level attributes. We also estimate the empirical models for both men and women, yielding educational penalties that are explicitly comparable. This allows us to generate estimates of the total reduction in schooling associated with early childbearing, as well as to investigate the potentially different schooling trajectories that men and women follow after an early first birth.

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[1] Given the extent of the literature we focus our discussion on the effects of early motherhood in the United States.

Our preliminary results are based on regression models that control for individuals' scholastic endowments and detailed family background characteristics and suggest a sizeable and significant negative effect of early childbearing on educational outcomes for both men and women. Specifically, we find that a teenage birth is associated with 0.6 ($p<0.001$) years fewer schooling for men. For women, this figure is 1.08 ($p<0.001$) years, which suggests a significantly larger penalty of teenage parenthood for women. Although the reductions in schooling associated with early fatherhood are generally smaller in magnitude than the reductions associated with early motherhood, the gender differential appears to vary substantially by education level. For example, the estimated reduction in the likelihood of completing high school associated with fatherhood before age 18 is roughly one fourth the dropout rate associated with motherhood before age 18. By comparison, the reduction in the likelihood of college completion associated with early fatherhood appears to be only half as large as the college completion penalty facing young mothers.

Although the rich set of control variables that we include in the empirical models should reduce omitted variables bias arising from unmeasured attitudes and abilities, the research design does not truly allow us to identify a causal relationship. Consequently, we consider additional specifications that limit the analysis sample to individuals experiencing an early childbirth, relying on the differential timing of childbirth among young parents for identification. Preliminary results from this subsample analysis indicate that smaller, but still substantial, educational penalties associated with early parenthood and that effects for women are generally larger than those found for men.

In the next section, we provide a brief overview of related literature, largely focusing on the small body of existing work that considers the relationship between educational attainment

and male fertility. In the following section, we describe the data and methods used in our analysis, after which we present our results. Finally, in the concluding section, we discuss our main findings in the context of previous estimates and describe the additional analyses that we plan to undertake.

Background

A large body of empirical work documents negative impacts of adolescent female childbearing on subsequent life-course trajectories. Although a wide variety later-life outcomes have been studied in this context, educational attainment is likely the most-intensely scrutinized. This research has often found a negative and sizeable impact of teenage fertility on years of schooling completed and the likelihood of high school completion (see the references listed above).[2] For example, Klepinger et al. (1999) found that a teenage pregnancy resulted in approximately 2.5 fewer years of schooling per mother, while Fletcher and Wolfe's (2009) analysis indicates that teenage motherhood reduced the likelihood of having a high school diploma by 5-10 percentage points. There is also tentative evidence of a negative and significant effect of teenage childbearing on college enrollment and completion (Hock 2008; Hoffman, Foster, and Furstenberg, 1993; McElroy, 1996).

Fatherhood has been an actively-growing area of demographic inquiry. However, research that draws males into the study of fertility is often rather narrow in scope, often following a "problem-oriented" approach (Goldscheider and Kaufman 1996; Greene and Biddlecom 2000). Male fertility research is also narrow in scale, owing to the limited number of

[2] Although there is some debate regarding the extent to which this association is (spuriously) driven by unobserved differences in underlying attitudes and abilities (Hotz, McElroy, and Sanders 2005; Ribar 1994), recent evidence confirms a negative causal effect of early fertility on educational attainment (Fletcher and Wolfe 2009).

data sets that collect data on male fertility. Most of the research on the trends in, and determinants of, male fertility in the United States rely on the NLSY79 (Gryn and Mott 2002; Hynes et al. 2008; Marsiglio 1987; Pirog-Good 1995) simply because it was (until recently) the only sizeable dataset that explicitly included fertility histories for men. For similar reasons, the body of research on early fatherhood and later life outcomes is very small.

In fact, we are only aware of three studies that explicitly consider the relationship between early fertility and subsequent male outcomes. All three use the NLSY79 data, and all consider educational outcomes in some form. Marsiglio (1987) is primarily concerned with the family arrangements of young fathers, but presents a simple bivariate analysis indicating that teenage fathers were substantially more less likely to have completed high school by age 20. Pirog-Good (1996) provides regression results based on specifications that control for a handful of characteristics of young men, finding that teenage fathers completed, on average, 1.25 fewer years of school than non-teenage-fathers.[3] However, given that the overwhelming evidence in the literature on female fertility indicates that teenage mothers are a highly selected group of individuals (Geronimus and Korenman 1993; Ribar 1994), interpreting these numbers as causal estimates of early fertility is somewhat problematic.

Attempting to account for factors determining selection into fatherhood, Brien and Willis (1997) follow a "control variable" strategy similar to that in McElroy's (1996) analysis of early motherhood. Their analysis concentrated on the association between completed years of schooling completed and delayed fatherhood, controlling for family background characteristics and individual aptitude. Our current results are based on a similar control variable approach, but presents estimates of the relationship between educational attainment and the *event* of

[3] Pirog-Good also indicates a significantly negative relationship between teenage fatherhood and the likelihood of high school completion, although she does not quantify the effect size.

childbearing, rather than imposing the more specifications that Brien and Willis rely on to estimate the relationship between attainment and the timing of childbearing. Our approach yields numbers that are more readily comparable to the existing literature on early motherhood. The analysis in this paper also builds on Brien and Willis in that we consider the relationship between early fertility and degree attainment, in addition to examining a simple continuous measure of completed schooling. This is particularly important from a policy perspective, given that the labor market returns to education are "lumpy".[4] Finally, we present estimates of educational penalties associated with early parenthood for both mothers and fathers generated using the same statistical approach, and, as a result, are explicitly comparable. To our knowledge, ours is the first study to do so.

Recent research that uses more sophisticated forms of matching and/or plausibly-exogenous variation in fertility to isolate the causal effects has yielded more conservative estimates of the impact of early motherhood on educational outcomes than what had been obtained using simple regression analysis (e.g., Hotz et al. 2005). Consequently, our control function estimates should still be interpreted cautiously, as they are likely to still be biased by unobserved factors that affect education and fertility decisions. In the current paper, we re-estimate our empirical models using subsamples of individuals who had given birth by various age thresholds, relying on the timing of first birth within this more homogenous population for identification. In the concluding remarks we extensions to this approach, as well as additional strategies that have been used in motherhood research, that we will implement in subsequent versions of our analysis to better account for selection into fatherhood.

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[4] I.e., four times the return to one year of college is smaller than the return to a completed degree.

Data, Sample, and Methods

The data set used to carry out this analysis is the National Longitudinal Survey of Youth 1979 (NLSY79). The NLSY is a nationally representative sample of 12,686 young men and women of all races who were ages 14-21 as of January 1st 1979.[5] Follow-up interviews were conducted annually until 1994, and biennially thereafter. This data set contains information on a wide variety of topics, allowing us to study the relationship between early parenthood and educational attainment among a large number of individuals using high quality measures of schooling and fertility.

As our interest is in early parenthood, we employed information on education and fertility at age 25. This required the use of data from up to nine survey waves, based on a given respondent's year of birth. We eliminated cases in which, because of missing data, it could not be determined if the respondent had a child before age 25. We also eliminated cases with missing data on educational attainment. This led to a final sample size of 5,187 men and 5,246 women. Since we do not reweight the data in the present analysis our gender-stratified samples are approximately 16% black and 25% Hispanic, as shown in Table 1, and over-represent poor whites as noted above.

Table 1 also provides gender-stratified sample means and standard deviations for the education and fertility measures employed in our analysis. The average years of schooling completed at age 25 is 12.6 for men and 12.7 for women. About 81% of men had completed high school at age 25, the comparable figure for women is 84%. At age 25, 16% of women had obtained a college education, for men this figure was about 15%. The statistics related to the age

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[5] The data set actually consists of three distinct samples: A core sample that is representative of all young men and women in the relevant cohorts, a supplemental sample that includes an oversample of black and Hispanic youths, and economically disadvantaged whites, and a sample of individuals serving in the military as of September 30, 1978. We use all three samples in our analysis.

at first birth in Table 1 show that men are less likely than women to experience parenthood before age 25. Among the men in our data, 11% experienced teenage parenthood (defined as first birth below age 20) compared to 26% of the women. While 13% of women in our sample became a parent before their 18th birthday, the comparable figure for men is only 3%. A first birth between age 18 and before age 21 is also more likely for women than for men; the percentages are 20% for women versus 13% for men. However, the likelihood of transitioning into (first) parenthood is similar for men and women between age 21 and before age 25: 22% for men and 20% for women.

We estimate the years of schooling completed and the probability of having completed high school and college using multivariate regression models (linear probability models for high school and college completion). We test for associations between first birth events and education using models that include dummies for "Teenage birth" and models that include dummies for "Age at birth < 18", "18 ≤ age at birth < 21", "21 ≤ age at birth < 25". The latter specification allows us to assess more specific hypotheses regarding the timing of first birth, which is desirable if, as we suspect, the parenthood penalty is greater the younger the father is when the child is born.

To test for gender differences in the magnitude of the estimated effects, we estimate all models separately for men and women. We provide estimates of the correlation from baseline models ("Model 1") that only control for race/ethnicity and respondents' birth year in addition to the early parenthood variables. We then estimate specifications that control for an extensive list of individual and family background characteristics. The associations found in simple models are expected to be sensitive to the inclusion of controls for individual and family background characteristics. On theoretical grounds it is easy to see that the choices of when to have a (first)

child and how much education to obtain are likely to be jointly determined. This raises the concern of spurious correlation. For example, suppose that early parenthood had no effect on educational attainment and that individuals with lower scholastic aptitude are less able to manage the dual burden of childrearing and studying. Consequently, they are less likely to achieve their educational goals when they become young parents. If individuals with lower scholastic aptitude are also more likely to have a birth when young (perhaps because of worse contraceptive knowledge, lack of access to abortion, etc.), then early parenthood will appear to have a negative effect on educational attainment.

While the research design in this paper does not permit identification of the causal relationship between fertility and educational attainment (which is why we use the term association), we attempt to minimize spurious correlation between the birth and education variables by controlling for a large set of individual and family background characteristics meant to proxy for individual endowments and preferences. Specifically, we estimate models that include the following variables ("Model 2"): Armed Forces Qualification Test (AFQT) score (and its square, divided by 1000), educational attainment of the respondent's parents, detailed living arrangement at age 14, mother worked in 1978, household subscribes to newspapers, magazines, or library, number of siblings, older siblings, foreign born, foreign language spoken at home during childhood, religion raised in, and attendance of religious service. We also control for missing data on AFQT, parental education, mother's work history, number of siblings, foreignborn, residence at age 14, and attendance of religious services.[6] The corresponding sample means and standard deviations by sex are shown in Table 2.

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[6] We created dummies to flag missing cases in these variables and assigned a value of 0 to any missing observation in the corresponding variable.

Most of our results are based on the "control variable" approach of Model 2. However, we also provide preliminary estimates from samples that restrict individuals by the timing of birth and the completion of basic education. Looking at more homogenous groups of individuals at the early stages of the life course attempts to create a comparison group that differs less according to the unmeasured attributes that may determine fertility and schooling outcomes, resulting in estimates of the parenthood penalty that is closer to the causal impact. We discuss extensions to this approach at the end of the paper, as well as additional methods that might account for unobserved heterogeneity.

Results

Full Sample Analysis

Table 3 presents estimates from regressions of highest grade completed at age 25 on teenage (first) birth and covariates. As discussed above we estimate the models for men and women separately. Model 1 only controls for respondents' birth year and race/ethnicity while Model 2 controls for detailed individual and family background characteristics. The parsimonious models explain approximately 7% of the variation in total years of schooling for men and 18% for women. When the detailed set of covariates is included in Model 2, the fit is substantially improved. The coefficient of determination of Model 2 is 48.5% for men and 49.1% for women, suggesting that the covariates explain about half the variation in educational attainment.

As shown in Table 3, a teenage birth is associated with a reduction in the total years of schooling completed. For men, the simple specification suggests a 1.32 year reduction (see Model 1). The comparable estimate for women is -2.04, suggesting a 2 year reduction, on average, in schooling at age 25 for teenage mothers. The male-female difference in the estimates is statistically significant. Looking at Model 2, we notice that the education penalty is estimated

to be significantly smaller for men and women when controlling for detailed individual and family background. The estimated penalties in Model 2 are approximately half the size of those from the more parsimonious models. For men the estimate falls (in absolute terms) from -1.32 to -0.6 while it decreased from -2.04 to -1.08 for women. Although smaller in magnitude, the schooling penalty associated with a teenage birth remains statistically significant in Model 2. Furthermore, the estimates from the model with detailed controls also suggest that the reductions in years of schooling completed associated with teenage birth is greater for women than men.

Table 4 shows the results from years of schooling models that include dummies for "Age at birth < 18", "18 ≤ age at birth < 21", and for "21 ≤ age at birth < 25". The omitted group is "no child by age 25". We notice that these more flexible specifications result in better overall fit, especially in the case of Model 1. The setup allows us to test more elaborate hypotheses regarding the effect as a function of the timing of the first birth. The estimates suggest that there is no statistical difference between fatherhood before age 18 and fatherhood between the ages of 18 and 21 for men. However, a transition to fatherhood between the ages of 21 and 25 is associated with a significantly smaller decline in years of schooling than an earlier first birth experience.

Based on the estimates from Model 2, parenthood between 21 and 25 is associated with a 0.56 year decline in schooling compared to 0.82 and 0.81 year declines when parenthood began before age 18 and between 18 to 21, respectively. As before, the estimates are larger for women, ranging from a penalty of 1.75 years when motherhood begins before reaching age 18 to a penalty of 0.71 for a first birth at or after age 21 and before reaching age 25. The results for women also differ from men with respect to the consequences of parenthood before age 21. For men there was no difference between fatherhood before age 18 and between 18 to (just under)

21, but for women the estimates suggest that motherhood before age 18 is significantly more detrimental than between 18 to 21. The associated penalties based on Model 2 are 1.75 and 1.16 years, respectively.

Table 5 provides estimates from linear probability models of the effect of parenthood before age 18 on the likelihood of high school completion at age 25. A first birth before age 18 is associated with a 8 percentage point reduction in the probability of graduating from high school for men according to the estimates from the detailed model (see Model 2). For women, the association is a 25 percentage point reduction in the probability of graduating from high school, four times the male effect size. The estimates confirm that the risks associated with very early parenthood, namely that of not completing high school, are particularly skewed towards women.

Table 6 shows the results from linear probability models of graduating from college by age 25. The models include dummies for "Age at birth < 18", "18 ≤ age at birth < 21", and for "21 ≤ age at birth < 25". The omitted group is no child by age 25. As for similar models of total years of schooling in Table 4, the estimates suggest that there is no statistical difference between fatherhood before age 18 and between ages 18 and 21 for men. However, the transition to fatherhood between ages 21 and 25 is associated with a similar increase in risk of not completing college. Based on the estimates from Model 2, the likelihood of graduating from college by age 25 is 8-9 percentage points lower among early fathers. Similarly, among women there are no significantly differences in the risk of graduating from college by age at firth birth. However, as before, the estimated penalty is significantly greater among women, as compared to men, and ranges between 14 and 16 percentage points based on the estimates from Model 2.

Subsample Analysis

Table 7 presents estimates of the effect of early parenthood on education obtained from subsamples using the same set of individual and family background controls as in Models 1 and 2.[7] The top quarter of the table shows the effect of having a birth before age 18 on the likelihood of completing high school among samples of individuals who became parents by age 20. Conditioning on birth by age 20 reduces the sample sizes to 816 men and 1748 women. As shown in Table 7, when examining differences in the timing of the first birth among men who all transitioned into parenthood before age 21, there is no evidence that fatherhood before age 18 affects the likelihood of completing high school. This suggests that the unobserved factors that explain early fatherhood might be strongly co-determined with the factors that explain high school completion. For women, however, parenthood before age 18 reduces the probability of completing high school by 17 percentage points (based on the more conservative estimates from Model 2). This

The remaining results in Table 7 refer to estimates from models of college completion based on samples of men and women who completed high school. The first set of results uses the same age at firth birth classification as in Table 6, that is dummies for "Age at birth < 18", "18 ≤ age at birth < 21", and for "21 ≤ age at birth < 25". As above the omitted group is "no child by age 25". Compared to the sample of all men and women (which was used to generate the results shown in Table 6) requiring the same level of basic schooling yields more homogenous samples. Interestingly, the estimates suggest the same pattern as in Table 6, the consequences of parenthood differ little by age of birth for both men and women. The results shown in the bottom half of Table 7 are based on linear probability regressions that further narrow the sample of

[7] We only report estimates for the age at first birth variables. The full set of estimates is available upon request.

individuals to men and women who had a birth before age 25. In these samples of indviduals who transitioned into parents before age 25, having a birth before age 21 is associated with a significantly smaller likelihood of completing college. There is no evidence that the estimated penalty differs between individuals who became parents before age 18 and those who became parents between age 18 and 21. Also, our preferred models (Model 2) suggest that the estimated effects of parenthood are similar between men and women. For women the penalty of parenthood before 21 is a reduction in the likelihood of completing college of 4-5 percentage points, while the range is 3-4 percentage points for men (Model 2). The last set of results also conditions on "no birth by age 18", resulting in a female sample of 1533 individuals and a male sample of 1209 individuals. By restricting the samples to the case of parenthood at age 18 (an age when high school will typically be completed) and thereafter, we ensure inference based on the relevant comparison group. We estimate the impact of a birth between ages 19-20 and ages 21-22 relative to the reference group (omitted) of "birth at ages 23-24". The results confirm our previous findings of penalties associated with a birth before age 21. Interestingly, the estimated effect sizes for women are about double those for men and larger than in the sample of women with a first birth anytime before age 25.

Conclusion

This study considers the relationship between early parenthood and educational attainment for both men and women. While a substantial body of work documents the negative impact of teenage motherhood on completed education, much less attention has been paid to the potentially deleterious impact of early fatherhood. Our analysis of NLSY data seeks to fill the existing gaps in knowledge by examining the association between early parenthood and a variety

of measures of educational attainment. Unlike previous studies we provide estimates for both men and women using the same statistical framework, which allows us to explicitly analyze gender differences in the average education penalty associated with early parenthood.

Our findings on early motherhood are consistent with those in the existing literature. Early motherhood is associated with lower educational attainment, but the association is weaker when background characteristics are accounted for. The patterns are generally similar when looking at educational attainment of men and early fatherhood. We find that the magnitudes of the estimated effects tend to be much smaller for men than for women, consistent with the idea that fathers shoulder less of the (immediate) burden of childrearing than mothers. The fact that for men, but not for women, early parenthood is associated with small and in some models statistically insignificant effects on the likelihood of completing high school while it has consistently strong negative effects on the likelihood of completing college is consistent with men being able to take on greater responsibilities when the transition to parenthood occurs after they have completed high school. While much of our evidence is based on the "control variable" approach, our preliminary estimates from samples that restrict individuals by the timing of birth and the completion of basic education to create comparison groups that differ less according to the unmeasured attributes that may determine fertility and schooling outcomes mostly confirm the patterns and effect sizes.

Our findings for men complement estimates provided in Brien and Willis (1997), who find a reduction in the average number years of schooling completed among early fathers when analyzing the "core" NLSY sample. Although their results are not directly comparable to ours, we speculate that the apparently stronger associations that we find reflects the greater struggle to cope with the demands of early childbearing among the oversampled black, Hispanic, and poor

white men included in our sample. In a revised version of this working paper we will analyze the potentially disparate effects of early fatherhood in these subpopulations of men who may find it particularly difficult to remain in school when faced with the pressure to provide more time and material resources to their young families.

The research design of the present study cannot establish whether the relationship between early parenthood and educational attainment is causal. We are not aware of any studies on the consequences of early male fertility that utilize such a design, but the literature on early motherhood provides several potential avenues that we might follow to account for unobserved heterogeneity. First, in a manner similar to the approach underlying Table 7, we can form tighter comparison groups that rely more precisely on the timing of childbearing in relation to schooling exit. This will allow us to further investigate the differential effects of parenthood over the part of the life cycle that is particularly relevant for the formation of human capital through the acquisition of formal education. A second, related approach is to form comparison groups using propensity score matching (Chevalier and Viitanen 2003). Third, we may control for family-level heterogeneity using fixed effects, relying instead on the variation in the timing of first birth between siblings (e.g., Geronimus and Korenman 1992; Hoffman et al. 1992). Finally, we may be able to follow an instrumental variables strategy that uses variation in fertility timing attributable to community-level, rather than individual-level factors to identify a causal effect (e.g., Klepinger et al. 1999).

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Table 1. Sample Mean and Standard Deviation	**Men**			**Women**		
Education, Fertility, Race/Ethnicity Variables	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**
Education Measures						
Highest Grade Completed at age 25	12.56	2.30	5187	12.68	2.24	5246
High School Completed at age 25	0.81	0.39	5187	0.84	0.37	5246
College Completed at age 25	0.15	0.36	5187	0.16	0.37	5246
First Birth Measures						
Teenage Birth	0.11	0.31	5187	0.26	0.44	5246
Age at birth < 18	0.03	0.17	5187	0.13	0.34	5246
18 $\leq$ age at birth < 21	0.13	0.33	5187	0.20	0.40	5246
21 $\leq$ age at birth < 25	0.22	0.41	5187	0.20	0.40	5246
Race/Ethnicity						
Black	0.16	0.37	5187	0.16	0.36	5246
Hispanic	0.25	0.44	5187	0.26	0.44	5246

Notes: Calculations based on valid observations.

Table 2. Sample Mean and Standard Deviation	Men			Women		
Individual and Family Background Variables	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**
Scholastic Endowment						
AFQT	41.35	29.96	4907	40.80	28.06	5032
AFQT squared	2.61	2.90	4907	2.45	2.72	5032
AFQT missing	0.05	0.23	5187	0.04	0.20	5246
Family Background Characteristics						
Mother no high school	0.41	0.49	4816	0.45	0.50	4963
Mother some college	0.10	0.30	4816	0.09	0.29	4963
Mother college graduate	0.08	0.27	4816	0.71	0.26	4963
Mother schooling data missing	0.07	0.26	5187	0.05	0.23	5246
Father no high school	0.43	0.49	4459	0.43	0.50	4496
Father some college	0.10	0.30	4459	0.09	0.29	4496
Father college graduate	0.15	0.35	4459	0.14	0.34	4496
Father schooling data missing	0.14	0.35	5187	0.14	0.35	5246
Lived w/ single mother at 14	0.16	0.37	5187	0.17	0.37	5246
Lived w/ father wo/ mother at 14	0.03	0.18	5187	0.03	0.16	5246
Lived wo/ mother and father at 14	0.04	0.20	5187	0.04	0.20	5246
Lived in other arrangement at 14	0.08	0.27	5187	0.09	0.29	5246
Mother worked in 1978	0.61	0.49	4919	0.61	0.49	4992
Mother worked in 1978 data missing	0.05	0.22	5187	0.05	0.21	5246
Household received newspaper at 14	0.76	0.43	5187	0.75	0.43	5246
Household received magazines at 14	0.57	0.50	5187	0.55	0.50	5246
Household had library card at 14	0.69	0.46	5187	0.72	0.45	5246
Has no siblings	0.03	0.17	5179	0.03	0.17	5238
Has one sibling	0.13	0.34	5179	0.12	0.33	5238
Has two siblings	0.21	0.41	5179	0.19	0.39	5238
Has older sibling(s)	0.73	0.44	5179	0.74	0.44	5238
Sibling data missing	0.00	0.04	5187	0.00	0.04	5246
Born outside U.S.	0.07	0.26	5186	0.07	0.25	5246
Foreignborn missing	0.00	0.01	5187	0.00	0.00	5246
Foreign language at home during childhood	0.21	0.41	5129	0.21	0.41	5197
Foreign language data missing	0.01	0.11	5187	0.01	0.10	5246
Lived outside U.S. at 14	0.03	0.16	5179	0.02	0.15	5237
Foreign residence at 14 data missing	0.00	0.04	5187	0.02	0.04	5246
Lived in the South at 14	0.35	0.48	5187	0.36	0.48	5246
Lived on farm/ranch at 14	0.06	0.23	5172	0.05	0.21	5229
Lived in countryside at 14	0.16	0.37	5172	0.16	0.37	5229
Residence at 14 data missing	0.00	0.05	5187	0.00	0.06	5246
Raised wo/ religion	0.05	0.22	5187	0.04	0.19	5246
Raised catholic	0.33	0.47	5187	0.34	0.47	5246
Raised jewish	0.01	0.09	5187	0.01	0.09	5246
Raised w/ other religion	0.10	0.30	5187	0.11	0.31	5246
Attends religious service regularly	0.49	0.50	5179	0.57	0.50	5240
Attendance data missing	0.00	0.04	5187	0.00	0.03	5246

*Notes: Calculations based on valid observations. AFQT squared is AFQT*AFQT/1000.*

Table 3. Highest Grade Completed at Age 25	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Teenage (First) Birth	-1.32***	-0.60***	-2.04***	-1.08***
	(0.08)	(0.07)	(0.06)	(0.05)
Black	-0.93***	0.07	-0.69*	0.26**
	(0.09)	(0.10)	(0.09)	(0.11)
Hispanic	-0.49***	0.96***	0.10***	1.27***
	(0.07)	(0.07)	(0.06)	(0.06)
AFQT		0.04***		0.05***
		(0.00)		(0.00)
AFQT squared		-0.05		-0.18***
		(0.03)		(0.03)
Parental education (Ref.: high school graduate)				
Mother no high school		-0.14**		-0.25***
		(0.06)		(0.06)
Mother some college		0.31***		0.35***
		(0.09)		(0.09)
Mother college graduate		0.66***		0.62***
		(0.11)		(0.10)
Father no high school		-0.19***		-0.20***
		(0.06)		(0.06)
Father some college		0.31***		0.20**
		(0.09)		(0.09)
Father college graduate		0.78***		0.53***
		(0.09)		(0.09)
Family Arrangement (Ref.: w/ mother and father)				
Lived w/ single mother at 14		-0.16**		-0.04
		(0.07)		(0.07)
Lived w/ father wo/ mother at 14		-0.22*		-0.55***
		(0.13)		(0.15)
Lived wo/ mother and father at 14		-0.05		-0.01
		(0.14)		(0.14)
Lived in other arrangement at 14		-0.36***		-0.23***
		(0.09)		(0.08)
Mother worked in 1978		-0.03		0.02
		(0.05)		(0.05)
Household received newspaper at 14		0.07		0.13**
		(0.06)		(0.06)
Household received magazines at 14		0.24***		0.13**
		(0.05)		(0.05)
Household had library card at 14		0.19***		0.20***
		(0.05)		(0.06)

Table 3. Highest Grade Completed (cont.)	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Siblings (Ref.: three or more siblings)				
Has no siblings		0.39***		0.21
		(0.15)		(0.15)
Has one sibling		0.40***		0.23***
		(0.08)		(0.07)
Has two siblings		0.36***		0.18***
		(0.06)		(0.06)
Has older sibling(s)		0.04		0.02
		(0.06)		(0.05)
Born outside U.S.		0.08		-0.05
		(0.13)		(0.12)
Foreign language at home during childhood		0.35***		0.32***
		(0.09)		(0.10)
Lived outside U.S. at 14		-1.20***		-0.77***
		(0.28)		(0.27)
Lived in the South at 14		0.00		0.11**
		(0.05)		(0.05)
Residence (Ref.: urban)				
Lived on farm/ranch at 14		-0.30**		0.20*
		(0.12)		(0.11)
Lived in rural area (not farm) at 14		-0.07		-0.02
		(0.06)		(0.06)
Religious upbringing (Ref.: protestant)				
No religion		-0.37***		-0.35***
		(0.11)		(0.12)
Catholic		-0.07		-0.05
		(0.06)		(0.06)
Jewish		0.44*		0.32
		(0.26)		(0.32)
Other religion		0.08		-0.05
		(0.08)		(0.07)
Attends religious service regularly		0.42***		0.36***
		(0.05)		(0.05)
Constant	11.93	9.85***	12.33	9.79***
	(0.19)	(0.21)	(0.23)	(0.26)
N	5187	5187	5246	5246
R2	0.071	0.485	0.183	0.491

Notes: Robust standard errors in parentheses, * p<0.05, ** p<.01, *** p<0.001. All models also control for respondents' birth year using a set of dummy variables.

Table 4. Highest Grade Completed at Age 25	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Age at first birth (Ref.: no birth before age 25)				
Age at birth < 18	-1.74***	-0.82***	-3.02***	-1.75***
	(0.15)	(0.13)	(0.09)	(0.08)
18 ≤ age at birth < 21	-1.66***	-0.81***	-2.11***	-1.16***
	(0.08)	(0.07)	(0.07)	(0.06)
21 ≤ age at birth < 25	-1.18***	-0.56***	-1.26***	-0.71***
	(0.07)	(0.06)	(0.07)	(0.06)
Black	-0.83***	0.08	-0.58***	0.26**
	(0.09)	(0.10)	(0.08)	(0.10)
Hispanic	-0.36***	0.96***	0.28***	1.28***
	(0.07)	(0.07)	(0.06)	(0.06)
AFQT		0.04***		0.05***
		(0.00)		(0.00)
AFQT squared		-0.07**		-0.17***
		(0.03)		(0.03)
Parental education (Ref.: high school graduate)				
Mother no high school		-0.11*		-0.24***
		(0.06)		(0.05)
Mother some college		0.31***		0.30***
		(0.09)		(0.09)
Mother college graduate		0.63***		0.56***
		(0.11)		(0.10)
Father no high school		-0.19***		-0.18***
		(0.06)		(0.06)
Father some college		0.28***		0.16*
		(0.09)		(0.09)
Father college graduate		0.73***		0.47***
		(0.09)		(0.09)
Family Arrangement (Ref.: w/ mother and father)				
Lived w/ single mother at 14		-0.17**		0.01
		(0.07)		(0.06)
Lived w/ father wo/ mother at 14		-0.22*		-0.54***
		(0.13)		(0.15)
Lived wo/ mother and father at 14		-0.05		0.03
		(0.14)		(0.14)
Lived in other arrangement at 14		-0.34***		-0.15**
		(0.09)		(0.08)
Mother worked in 1978		-0.03		0.03
		(0.05)		(0.05)
Household received newspaper at 14		0.07		0.12**
		(0.06)		(0.06)
Household received magazines at 14		0.22***		0.12**
		(0.05)		(0.05)
Household had library card at 14		0.19***		0.19***
		(0.05)		(0.05)

Table 4. Highest Grade Completed (cont.)	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Siblings (Ref.: three or more siblings)				
Has no siblings		0.33**		0.10
		(0.15)		(0.14)
Has one sibling		0.36***		0.19***
		(0.08)		(0.07)
Has two siblings		0.34***		0.13**
		(0.06)		(0.06)
Has older sibling(s)		0.02		-0.01
		(0.06)		(0.05)
Born outside U.S.		0.08		-0.07
		(0.13)		(0.12)
Foreign language at home during childhood		0.34***		0.31***
		(0.09)		(0.10)
Lived outside U.S. at 14		-1.21***		-0.71***
		(0.28)		(0.26)
Lived in the South at 14		0.01		0.09*
		(0.05)		(0.05)
Residence (Ref.: urban)				
Lived on farm/ranch at 14		-0.28**		0.20*
		(0.12)		(0.11)
Lived in countryside at 14		-0.08		-0.02
		(0.06)		(0.06)
Religious upbringing (Ref.: protestant)				
No religion		-0.38***		-0.28**
		(0.11)		(0.11)
Catholic		-0.08		-0.07
		(0.06)		(0.06)
Jewish		0.42		0.24
		(0.27)		(0.32)
Other religion		0.10		-0.05
		(0.08)		(0.07)
Attends religious service regularly		0.42***		0.35***
		(0.05)		(0.05)
Constant	12.35***	10.10	12.82***	10.23
	(0.19)	(0.21)	(0.22)	(0.25)
N	5187	5187	5246	5246
R2	0.128	0.497	0.267	0.491

Notes: Robust standard errors in parentheses, * p<0.05, ** p<.01, *** p<0.001. All models also control for respondents' birth year using a set of dummy variables.

Table 5. High School Completed at Age 25	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Age at birth < 18	-0.17***	-0.08**	-0.38***	-0.25***
	(0.04)	(0.04)	(0.02)	(0.02)
Black	-0.14***	-0.02	-0.10***	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Hispanic	-0.05***	0.16***	0.02**	0.19***
	(0.01)	(0.01)	(0.01)	(0.01)
AFQT		0.02***		0.02***
		(0.00)		(0.00)
AFQT squared		-0.11***		-0.11***
		(0.01)		(0.01)
Parental education (Ref.: high school graduate)				
Mother no high school		-0.03**		-0.05***
		(0.01)		(0.01)
Mother some college		-0.02		-0.01
		(0.01)		(0.01)
Mother college graduate		-0.01		-0.02**
		(0.01)		(0.01)
Father no high school		-0.06***		-0.04***
		(0.01)		(0.01)
Father some college		0.01		-0.01
		(0.01)		(0.01)
Father college graduate		0.01		-0.01
		(0.01)		(0.01)
Family Arrangement (Ref.: w/ mother and father)				
Lived w/ single mother at 14		-0.04***		-0.03**
		(0.02)		(0.01)
Lived w/ father wo/ mother at 14		-0.06*		-0.13***
		(0.03)		(0.03)
Lived wo/ mother and father at 14		-0.02		-0.06**
		(0.03)		(0.03)
Lived in other arrangement at 14		-0.08***		-0.04**
		(0.02)		(0.02)
Mother worked in 1978		-0.01		0.02*
		(0.01)		(0.01)
Household received newspaper at 14		0.03*		0.01
		(0.01)		(0.01)
Household received magazines at 14		0.02**		0.03**
		(0.01)		(0.01)
Household had library card at 14		0.03***		0.02**
		(0.01)		(0.01)

Table 5. High School Completed at Age 25 (cont.)	**Men**		**Women**	
	Model 1	**Model 2**	**Model 1**	**Model 2**
Siblings (Ref.: three or more siblings)				
Has no siblings		0.03		0.05**
		(0.03)		(0.02)
Has one sibling		0.03**		0.02*
		(0.01)		(0.01)
Has two siblings		0.04***		0.03***
		(0.01)		(0.01)
Has older sibling(s)		-0.02**		0.00
		(0.01)		(0.01)
Born outside U.S.		0.00		-0.03
		(0.02)		(0.02)
Foreign language at home during childhood		0.05***		0.04**
		(0.02)		(0.02)
Lived outside U.S. at 14		-0.12***		-0.07**
		(0.04)		(0.04)
Lived in the South at 14		0.00		0.01
		(0.01)		(0.01)
Residence (Ref.: urban)				
Lived on farm/ranch at 14		0.00		0.03
		(0.02)		(0.02)
Lived in countryside at 14		0.00		0.02
		(0.01)		(0.01)
Religious upbringing (Ref.: protestant)				
No religion		-0.07***		-0.03
		(0.03)		(0.03)
Catholic		0.02		0.01
		(0.01)		(0.01)
Jewish		-0.02		-0.01
		(0.03)		(0.03)
Other religion		0.04**		0.00
		(0.01)		(0.01)
Attends religious service regularly		0.05***		0.03***
		(0.01)		(0.01)
Constant	0.76***	0.38***	0.81***	0.41***
	(0.04)	(0.04)	(0.04)	(0.05)
N	5187	5187	5246	5246
R2	0.033	0.293	0.134	0.329

Notes: Robust standard errors in parentheses, * p<0.05, ** p<.01, *** p<0.001. All models also control for respondents' birth year using a set of dummy variables.

Table 6. College Completed at Age 25	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Age at first birth (Ref.: no birth before age 25)				
Age at birth < 18	-0.19***	-0.08***	-0.29***	-0.14***
	(0.01)	(0.01)	(0.01)	(0.01)
18 ≤ age at birth < 21	-0.19***	-0.09***	-0.29***	-0.17***
	(0.01)	(0.01)	(0.01)	(0.01)
21 ≤ age at birth < 25	-0.16***	-0.08***	-0.24***	-0.16***
	(0.01)	(0.01)	(0.01)	(0.01)
Black	-0.10***	0.02	-0.08***	0.00
	(0.01)	(0.02)	(0.01)	(0.02)
Hispanic	-0.09***	0.05***	-0.04***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)
AFQT		0.00***		0.00**
		(0.00)		(0.00)
AFQT squared		0.07***		0.07***
		(0.01)		(0.01)
Parental education (Ref.: high school graduate)				
Mother no high school		0.00		-0.01
		(0.01)		(0.01)
Mother some college		0.07***		0.03
		(0.02)		(0.02)
Mother college graduate		0.14***		0.12***
		(0.03)		(0.03)
Father no high school		0.00		-0.02*
		(0.01)		(0.01)
Father some college		0.03		0.02
		(0.02)		(0.02)
Father college graduate		0.13***		0.12***
		(0.02)		(0.02)
Family Arrangement (Ref.: w/ mother and father)				
Lived w/ single mother at 14		-0.03**		0.00
		(0.01)		(0.01)
Lived w/ father wo/ mother at 14		-0.02		-0.03
		(0.02)		(0.02)
Lived wo/ mother and father at 14		-0.01		0.01
		(0.02)		(0.02)
Lived in other arrangement at 14		-0.03**		-0.03**
		(0.01)		(0.01)
Mother worked in 1978		0.00		-0.01
		(0.01)		(0.01)
Household received newspaper at 14		0.00		0.00
		(0.01)		(0.01)
Household received magazines at 14		0.02**		0.01
		(0.01)		(0.01)
Household had library card at 14		0.02*		-0.01
		(0.01)		(0.01)

Table 6. College Completed at Age 25 (cont.)	Men		Women	
	Model 1	Model 2	Model 1	Model 2
Siblings (Ref.: three or more siblings)				
Has no siblings		0.06*		0.02
		(0.03)		(0.03)
Has one sibling		0.08***		0.02
		(0.02)		(0.02)
Has two siblings		0.04***		0.01
		(0.01)		(0.01)
Has older sibling(s)		0.03**		0.01
		(0.01)		(0.01)
Born outside U.S.		0.03		0.01
		(0.02)		(0.02)
Foreign language at home during childhood		0.00		0.03*
		(0.02)		(0.02)
Lived outside U.S. at 14		0.03		0.04
		(0.03)		(0.03)
Lived in the South at 14		0.01		0.02**
		(0.01)		(0.01)
Residence (Ref.: urban)				
Lived on farm/ranch at 14		0.00		0.05**
		(0.02)		(0.02)
Lived in countryside at 14		-0.01		-0.01
		(0.01)		(0.01)
Religious upbringing (Ref.: protestant)				
No religion		-0.03*		-0.03
		(0.01)		(0.02)
Catholic		-0.02		-0.02
		(0.01)		(0.01)
Jewish		0.07		0.18***
		(0.06)		(0.06)
Other religion		-0.01		-0.01
		(0.01)		(0.01)
Attends religious service regularly		0.06***		0.06***
		(0.01)		(0.01)
Constant	0.16***	-0.06	0.24***	0.03
	(0.02)	(0.03)	(0.02)	(0.03)
N	5187	5187	5246	5246
R2	0.084	0.340	0.154	0.340

Notes: Robust standard errors in parentheses, * p<0.05, ** p<.01, *** p<0.001. All models also control for respondents' birth year using a set of dummy variables.

Table 7. Additional Results	Men		Women	
	Model 1	Model 2	Model 1	Model 2
	High School Completion (birth by age 20)			
Age at first birth (Ref.: birth at age 18, 19 or 20)				
Age at birth < 18	-0.05	-0.02	-0.24***	-0.17***
	(0.04)	(0.04)	(0.02)	(0.02)
N	816	816	1748	1748
R2	0.042	0.327	0.091	0.326
	College Completion (high school completion)			
Age at first birth (Ref.: no birth before age 25)				
Age at birth < 18	-0.22***	-0.12***	-0.29***	-0.17***
	(0.01)	(0.01)	(0.01)	(0.01)
18 ≤ age at birth < 21	-0.21***	-0.12***	-0.30***	-0.20***
	(0.01)	(0.01)	(0.01)	(0.01)
21 ≤ age at birth < 25	-0.18***	-0.10***	-0.24***	-0.17***
	(0.01)	(0.01)	(0.01)	(0.01)
N	4219	4219	4399	4399
R2	0.081	0.324	0.141	0.326
	College (HS, birth by age 24)			
Age at first birth (Ref.: 21 ≤ age at birth < 25)				
Age at birth < 18	-0.06***	-0.04***	-0.06***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
18 ≤ age at birth < 21	-0.04***	-0.03**	-0.06***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)
N	1405	1405	2078	2078
R2	0.021	0.168	0.026	0.129
	College (HS, birth by 24, no birth by 18)			
Age at first birth (Ref.: 23 ≤ age at birth < 25)				
19 ≤ age at birth < 21	-0.06**	-0.04**	-0.10***	-0.08***
	(0.02)	(0.01)	(0.02)	(0.02)
21 ≤ age at birth < 23	-0.04*	-0.03	-0.08***	-0.06***
	(0.02)	(0.02)	(0.02)	(0.02)
N	1209	1209	1533	1533
R2	0.022	0.173	0.041	0.138

Notes: Robust standard errors in parentheses, * p<0.05, ** p<.01, *** p<0.001. All models also control for respondents' birth year using a set of dummy variables.