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Father Absence and the Educational Gender Gap

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Abstract: The educational attainment of young women now exceeds that of young men in most of the developed world, and women account for about 60% of new four-year college graduates in the United States. Several studies have suggested that the increase in single-parent households may be contributing to the growing gender gap in education, as boys are more vulnerable to the negative effects of father absence and economic disadvantage than girls. Using data on recent cohorts of young men and women from the National Longitudinal Study of Adolescent to Adult Health (Add Health), I find evidence consistent with other studies that boys are relatively more likely to experience problems in school, including school suspensions, when their father is absent, but also that girls are relatively more likely to experience depression in adolescence, particularly in step-father families. By the time Add Health subjects are young adults, there is no evidence that father absence early in life is more strongly associated with lower rates of college graduation for men, compared to women, in either cross-sectional or family fixed-effect models.

JEL Classification: I20, J12, J16

Keywords: Education, college graduation, gender, family structure, father absence, school quality

In 1990, the proportion of young women (aged 25 to 29) who had completed four-year college degrees reached near equality with young men in the United States, after steadily increasing for several decades. By 2014, the long-standing gender gap in educational attainment had not just disappeared but reversed—favoring women by a substantial margin. More than 37 percent of young women now have four-year college degrees or higher educational attainment, compared to less than 31 percent of young men (U. S. Census, 2016b). Similar gender gaps in education are opening up around the world, with women completing tertiary degrees at higher rates than men in almost all OECD countries (OECD, 2015).

Rising female educational attainment has been an unsurprising consequence of the removal of barriers to women's schooling and labor force participation that had limited investments in women's human capital. However, the emergence of a female advantage in higher education, even though women continue to have lower employment rates and shorter work hours than men, has been treated as a puzzle in the social sciences. Some studies find a gender gap in benefits to education, such as a higher college wage premium for women than for men (Dougherty, 2005) but a consensus seems to be emerging that the principal source of the college gap lies in gender differences in the nonpecuniary costs of educational persistence. These cost differences are reflected in a persistent female advantage in school performance at all levels and are due, some argue, to lower levels of non-cognitive skills among boys.

An extensive literature in education and the social sciences has documented gender differences in the academic and behavioral outcomes of boys and girls in elementary and secondary school (Buchmann, DiPrete, and McDaniel, 2008). These gender gaps are not new phenomena: girls have consistently outperformed boys in grades and have been less likely to get in trouble at school (Duckworth and Seligman, 2006). Recent studies interpret the observed gender differences in academic performance, grade repetition, special education placement, homework hours and school reports of disruptive behavior as indicative of gaps between the non-cognitive skills of boys and girls (Becker, Hubbard, and Murphy, 2010; Goldin, Katz, and Kuziemko, 2006). Gender gaps in social and behavioral skills appear to develop early–girls begin school with more advanced learning skills than boys, and this advantage grows over time. These early skill gaps, in turn, explain much of

the gender differential in early elementary academic outcomes (DiPrete and Jennings, 2012).

Recent research has focused on possible causes of this gender gap in skills, including the possibility that the development of capabilities that enhance academic achievement, such as self-control, is more sensitive to family disadvantage among boys than it is for the skill development of girls. Autor and Wasserman (2013) suggest that the increased prevalence of single-parent families and decreased contact with a stable male parent may have a particularly negative impact on boys and contribute to the growing gender gap in education, either because boys are more vulnerable to the loss of parental time and financial resources, or due to a role model effect of the same-sex parent.[1] Two recent studies report empirical evidence consistent with this hypothesis. Bertrand and Pan (2013) find that the gender gap in early behavior problems and school suspensions is much larger for the sons and daughters of single mothers than for children in two-parent households. They interpret this as evidence that the non-cognitive skills of boys are adversely impacted by non-traditional family arrangements, and suggest that "boys' higher tendency to act out and develop conduct problems might be particularly relevant to their relative absence in colleges." Autor, Figlio, Karbownik, Roth, and Wasserman (2016) examine the effects of several dimensions of family disadvantage, including mother's education and marital status, father presence, an SES index, neighborhood income and school quality on school performance and high school graduation for a large sample of children in Florida. They find that family structure, including father presence, has significantly greater effects on school absences and suspensions in Grades 3 through 8 for boys, compared to girls.

So far, these studies have focused on the effects of father absence on school achievement and disciplinary measures rather than adult outcomes, including educational attainment. Assessing the role of excess male vulnerability to father absence in explaining the emerging gender gap in college graduation requires longitudinal data that permits us to link family structure in childhood with longer-term outcomes, including final educational

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[1] A few studies find that boys may do worse, emotionally and academically, following a divorce (Hetherington and Kelly, 2002), but meta-analysis of (correlational) studies of father absence and child wellbeing by Amato and Gilbreth (1999) finds no support for the hypothesis that boys benefit more than girls from paternal involvement. The vulnerable male story is also difficult to square with the findings of Bailey and Dynarski (2011) that the growing gender gap in college attendance rates is driven primarily by increases in the education of daughters of high-income parents.

attainment.[2] Brenøe and Lundberg (2018) are able to do this with Danish administrative data. Linking entire population cohorts from birth into adulthood, they find that family disadvantage, particularly low maternal education, has more negative effects on school-age outcomes of boys relative to girls, as expected. Administrative data provides few adolescent measures; the key outcome is a marker for completing primary school on time. Long-term effects are quite different; early disadvantage tends to have stronger impacts on the educational attainment, employment, and earnings of adult women, compared to adult men. Family structure and parents' marital status at birth tend to have weak and inconsistent effects on later outcomes, but there is less variation in these indicators than in U.S. data and the comprehensive Danish social welfare system may mitigate the impacts of family disruption on children.

In this study, I use rich longitudinal data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) that lets me examine a much broader set of adolescent outcomes, and also extend analysis of the impacts of early father absence to long-run outcomes, including college graduation, in an American context. In particular, I examine the association between family structure in adolescence and outcomes that include behavior in school, mental health, relationships with parents, educational aspirations, and educational attainment for a recent cohort of young adults. In both cross-sectional and fixed-effects estimates using a sample of full siblings, I find, as do prior studies, that boys are more sensitive to father absence in terms of reports of problems in school. What is new is that girls are more likely than boys to respond to father absence with increased indicators of depression, and are particularly negatively affected by residence with a stepfather. When we turn to final educational attainment in later waves of Add Health, however, family structure in adolescence does not have differential effects on the college graduation rates of men and women.

These results suggest that it may be premature to interpret the greater elasticity of boys' behavioral and school disciplinary problems to father absence and other dimensions of family disadvantage as evidence of a gender gap in non-cognitive skills that could, in turn,

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[2] The only measure of educational attainment examined in any of the studies discussed above is high school graduation in Autor et al. (2016). For this outcome, they can use only their oldest cohorts of Florida students and are not able to link siblings, so the models are cross-sectional. Father presence is not included, but mother's marital status and mother's college graduation do have significantly larger associations with the high school graduation of sons compared to daughters.

help to explain the college gender gap. School-age boys and girls appear to respond to father absence and step-father families with distinct, gender-typical behaviors that haven't been previously noted, and that appear to have similar implications for long-term outcomes. Though non-traditional family structures in adolescence are associated with lower educational attainment for both men and women, there appears to be no significant gender difference in the effects of family structure on college graduation rates, and no evidence of greater male vulnerability to father absence in the long run.

I. Data

The National Longitudinal Study of Adolescent to Adult Health (Add Health) has collected a rich array of longitudinal data on the social, economic, psychological and physical well-being of young men and women from adolescence through young adulthood.[3] The Add Health study began in 1994-95 with a nationally-representative school-based survey of more than 90,000 students in grades 7 through 12. The students were born between 1976 and 1984 and attended one of 132 schools in the sampling frame. In addition to oversamples of several ethnic groups and disabled students, the Add Health genetic sample includes sibling pairs living in the same household, including twins, half-siblings, and biologically unrelated siblings. About 20,000 respondents were followed in subsequent surveys, the last of which (Wave IV) was conducted in 2007-08 when the respondents were between 24 and 32 years of age.

A. Father Absence in Add Health

During the Wave I survey, nearly 90 percent of the Add Health respondents, most of whom were between 12 and 18 years of age, were living with their biological mother. Of this group, however, almost 10 percent were also living with a step-father or other father figure rather than their biological father, and nearly 28 percent were living with no father

figure at all (see Table 1). Race and ethnic differences in family circumstances were substantial, with black and Hispanic teenagers less likely to live with both biological parents than white, non-Hispanic teenagers—in fact, more than half of the black subsample were living with no father figure. There are smaller, but notable differences in family structure by gender. Girls were 11 percent more likely to be living with no father than were Add Health boys. To focus on gender differences in responses to father absence, most of the analysis in this paper uses subsamples of 3,868 non-Hispanic white women and 3,459 non-Hispanic white men who lived with their biological or adoptive mother in Wave I, and for whom all key variables are non-missing.[4]

B. Outcomes

The focus of this study is the association between father absence in adolescence and two sets of outcomes: contemporaneous measures from the Wave I survey, when the respondents are in school, and educational attainment, including college graduation, from the most recent available survey, Wave IV, when the respondents are young adults.

1. Early Outcomes

The Wave I survey collected an array of child-reported variables, including health, personality, experiences in school, and relationships with parents, siblings, friends and others. I use self-reports of Math and English grades and of school problems, including school suspensions, to generate academic and behavioral outcomes that are similar to those in previous studies and augment this with a standard depression scale and reports of educational aspiration.

School Problems: Students were asked about problems they experience in school, including trouble getting along with teachers and other students, trouble getting homework done and trouble paying attention in class (coded 0-4 from "never" to "every day"), how many times they have been absent without an excuse, and whether they have ever received an out-of-

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[4] The discrepancy in the male-female sample sizes is the result of consistently lower rates of both contact and response for male Add Health sample members. By Wave IV, the overall male/female response ratio had fallen to .88 from .98 in Wave I, very close to the .89 in my sample. Brownstein et al. (2011) conclude that Wave IV non-response results in very little bias in measures of health and risk-taking. The unweighted rates of college graduation in this sample (.33 for men, .41 for women) are somewhat lower than the rates for equivalent cohorts in the Current Population Survey (.35 for men, .43 for women) but the gender ratio is the same (U.S. Census, 2016a).

school suspension. Factor analysis was used to aggregate these measures into a standardized school problems index.

Depression: Wave I respondents were asked how often during the past week they felt sad, lonely, depressed, blue, happy, or hopeful. These six items (plus 13 more) are the components of CES-D, a standard depression scale (Radloff, 1977). Factor analysis indicated that a single factor is appropriate for these 19 items and was used to form a standardized depression index.

Grades and Aspirations: Students reported their math and English grades in the most recent grading period. Educational aspirations in Wave I are based on student responses (on a 5-point scale) regarding how much they want to attend college, and how likely they think it is that they will attend college.

Table A1 presents summary statistics by gender for these variables for the white, non-Hispanic sample. Gender differences in means are as expected: adolescent boys have higher rates of school problems, lower grades, and lower educational aspirations.

2. Educational Attainment

Highest educational attainment is measured in the Wave IV survey of Add Health, collected when most respondents are between 25 and 31 years of age. Most, though not all, will have completed their final level of formal schooling at this point. I focus on the attainment of a 4-year college degree, since the rising returns to education in recent decades have largely been restricted to college graduates. Though there is a gender gap in high school graduation and college attendance as well, the college graduation gap has received the most attention given its substantial implications for lifetime income. I also examine high school graduation, however, as well as imputed years of schooling and a categorical education variable that ranges from 0=less than high school to 5=post-graduate degree. Table A1 confirms that the women in the Add Health sample have higher rates of high school graduation and college graduation than adult men.

Educational attainment is strongly correlated with father absence in adolescence for both men and women: 42 percent of women who lived in adolescence with their biological fathers graduated from college compared to 24 percent of women with no father in the

household (for men, the comparable numbers are 34 and 18 percent). Figure 1 plots the college graduation rates for men and women in the white, non-Hispanic Add Health sample who were in each of the three family structure groups in adolescence. Though women are more likely to be college graduates in each group, the ratios of male to female graduates are not significantly different. In the raw data, therefore, there is no clear evidence that father absence has a more negative influence on the educational prospects of boys than girls.

II. Empirical Strategy

A causal estimate of the difference in impacts of father absence on outcomes for boys and girls requires that the distribution of male and female children across households with and without fathers is identical in terms of their potential outcomes with a father present. For any outcome Y for boys *(b)* and girls *(g)*, we can define possible outcomes in alternative family structures as:

$$Y_b \in \{Y_b^0, Y_b^1\}, \quad Y_g \epsilon \{Y_g^0, Y_g^1\},$$

Where Y_i^0 is the outcome for child i if his or her father is present in the household *(A=0)*, and Y_i^1 is the outcome if their father is absent *(A=1)*.

The average difference in outcomes between boys in father-absent and father-present households is:

$$E[Y_b|A = 1] - E[Y_b|A = 0] =$$

$$(E[Y_b^1|A = 1] - E[Y_b^0|A = 1]) + (E[Y_b^0|A = 1] - E[Y_b^0|A = 0])$$

The first term is the average causal impact of father absence for boys raised in father-absent households; the second term is selection bias—the difference between potential outcomes in the father-present state between boys who were raised in that state and boys who were not. This will generally be non-zero, and any estimate of the effect of father absence will be biased if there are unobserved differences in child capabilities and mother characteristics in father-present and father-absent households. An estimate of the gender difference in the effects of father absence, however, will be unbiased if the selection terms are identical for boys and girls.

Estimates may not be unbiased, however, if father absence and child gender are not independent, and the fact that girls are more likely to live in father-absent households than boys raises the possibility of selection on child or maternal characteristics. One mechanism may be parental decisions about marriage and custody that are child gender-specific: fathers are more likely to co-reside with, seek custody of, and marry the mothers of their sons rather than their daughters (Lundberg and Rose, 2003; Lundberg, 2005; Raley and Bianchi, 2006; Dahl and Moretti, 2008). Another may be through the effects of parental circumstances on the gender mix of offspring: evidence is mounting that prenatal stress (which may be related to partnership status) has differential impacts on the mortality of male and female fetuses, though the effects are small (Almond and Edlund, 2007; Hamoudi and Nobles, 2014, Norberg, 2004).

Table 2 presents tests for differences in observable household characteristics between boys and girls in the same family structure. This exercise shows little evidence of differential selection of boys and girls in Add Health into the three family structure types (biological father, other father, no father), since the means of maternal characteristics, family income, and birth weight are significantly different in only two of 21 cases.[5]

Though substantial bias due to differential selection seems unlikely, an alternative approach to estimating gender differences in the impact of father absence is to use family fixed-effects and compare the outcomes of brothers and sisters across family structure groups. This requires that we assume only that the gender gap in sibling potential outcomes is independent of family disadvantage. A within-family approach eliminates concerns about selection, but has the disadvantage that it restricts estimation to families with gender-discordant siblings. It is not obvious that the causal impact of father absence must be independent of the presence of siblings or sibling gender composition. If there are behavioral spillovers within the family (if boys, for example, engage in more stereotypical male behavior when they have a brother, rather than a sister), or if maternal investments in boys and girls are affected by family size or by child gender mix, then fixed-effect estimates of the effect of father absence may not be representative.

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[5] Autor et al. (2016) and Brenøe and Lundberg (2018) show that there are no gender differences in the effects of family disadvantage on outcomes at birth, which suggests an absence of selection on child capability, but Add Health does not have similar early measures.

Cross-sectional models of both early outcomes and measures of educational attainment are estimated as OLS regressions, linear probability models or, for categorical educational attainment, an ordered logit model of the form:

$$Y_i = \beta_0 + \beta_1 MALE_i + \beta_2 NF_i + \beta_{32} OF_i + \beta_4 NF_i \times MALE_i + \beta_5 OF_i \times MALE_i + X_i\gamma + \varepsilon_i$$

NF_i is a dummy variable equal to one if child i lived in a household with no father figure in Wave I and OF_i is equal to one if a non-biological, non-adoptive father, such as a step-father, lived in the household. X_i includes maternal characteristics and the child's birth cohort. The coefficients of interest are those on the family structure-male dummy interaction terms–β_4 and β_5. Standard errors are clustered by the school attended in Wave I.

Fixed-effects models use a sample of mixed-sex siblings with the same mother and father who lived in the same household in Wave I to estimate within-family determinants of educational attainment. Since siblings experience the same family structure in Wave I, the fixed-effects model is:

$$Y_{ij} = \delta_0 + \delta_1 MALE_{ij} + \delta_2 NF_j \times MALE_{ij} + \delta_3 OF_j \times MALE_{ij} + Z_{ij}\theta + \varphi_j + \upsilon_{ij}$$

where the variables in Z_{ij} (mother's age at birth and birth order) vary across siblings and φ_j is a family fixed effect.

III. Results

A. Early Outcomes: School Problems, Depression, Grades and Educational Aspirations in Wave I

Tables 3-5 report estimates of the effects of family structure in Wave I on the behavior and achievements of school children. Table 3 shows the determinants of the school problem index and its components. Male students report higher incidence of all individual school difficulties except absences, and the male effect on the index itself is greater than one-quarter of a standard deviation. Living in a household without a father or father figure is positively associated with each reported school problem, and a step-father family increases the overall index and is significantly associated with a couple of the

components. In these results we see some evidence of differential male susceptibility to non-traditional family structure. The male/no-father interaction is significantly predictive of school suspensions, reported problems paying attention in school and getting homework done, and the overall school problems index. The results for school suspensions in particular are strongly consistent with the findings of both Bertrand and Pan and Autor et al.[6] It is worth noting that the kinds of school difficulties captured by this index tend to be associated with the self-control and behavioral issues that teachers report are more typical of boys.

A different picture emerges when we look at another set of Wave I self-reports—the components of a depression index (Table 4). Boys are significantly less likely to report experiencing negative emotions frequently, and youth in no-father and step-father families are more likely to make such reports. Significantly, the interaction terms indicate that depression in girls is more strongly associated with non-traditional family structure than is depression in boys. This is particularly true of living with a step-father or other father figure, which has a substantially higher positive effect on the depression index and several index components for girls than for boys. Depression is one example of an "internalizing" response to stress that is more common for girls, as opposed to the "externalizing" or disruptive behavior more typical of boys (Leadbeater, Kuperminc, Blatt, and Hertzog, 1999). The contrasting results in the last two tables show that our conclusions about which gender is more sensitive to father absence may depend on which school outcomes we are measuring.[7]

Family structure does not appear to have any differential effect on self-reported grades in English and Math, though we find the usual pattern that boys' grades are lower than girls, particularly in English (Table 5). When asked in Wave I about their college plans, Add Health boys are less likely than girls to report either that they want to attend college or that they expect to attend college.[8] In this case, being in a household with no

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[6] Bedard and Witman (2015), who find that the gender gap in diagnosis and treatment of ADHD is much larger in non-traditional families, suggest that parents in traditional families may find it easier to cope with male behavioral difficulties in early life.

[7] Using the Add Health data, Slade, Beller, and Powers (2017) find a stronger association between nontraditional family structure in childhood and health outcomes, including depression, self-reported health and smoking, for girls. They also find that many of the effects of father absence on health and mental health outcomes in Wave I, including depression, are no longer significant in Wave IV.

[8] Fortin, Oreopoulos and Phipps (2015) find that much of the gender gap in high school grades can be attributed to differences in the post-school plans of boys and girls.

father appears to have a more severe effect on the college intentions of boys—they are substantially less likely to report a strong desire to attend college than girls in similar families.

The results in this section both reinforce and expand upon the findings of previous studies that show excess vulnerability of school-aged boys in the face of family disadvantage and father absence. The gender gap in school problems is much higher for adolescents who are not living with both biological parents, and this pattern is consistent with earlier studies that find increasing gender gaps in schools suspensions and externalizing behavior. Examining an aspect of problematic internalizing behavior— depression—indicates that girls may have distinctive responses to family disadvantage not reflected in standard measures of school achievement and disciplinary outcomes.

B. Possible Mechanisms.

Earlier discussions of why single parenthood and economic disadvantage may have particularly negative effects on boys may also help to illuminate the distinct gendered responses to father absence documented in the previous section. One possible source of these differences may be sex differences in early developmental trajectories. Preschool girls are more mature than preschool boys in language skills and emotional regulation, and this may increase their resilience in some adverse circumstances. The absence of a stable, same-sex parent may also have distinct behavioral effects on boys, as the presence of a step-father appears to have for girls. Others have argued that school environments, with predominantly female teachers, fail to adapt to the learning needs of boys (Dee, 2007). A cultural explanation is provided by DiPrete and Buchmann (2013), who argue that developing a masculine self-image may involve a rejection of school values, and that this "oppositional culture" may be particularly relevant for boys with absent or low-education fathers. The effects of father absence on boys' desire to attend college provides some support for this mechanism.

Finally, parental investments in low-resource environments may differ by child gender. Though a large literature shows that, on average, fathers spend more time with sons than with daughters, and that this gap grows with age (Lundberg, 2005; Raley and

Bianchi, 2006), Bertrand and Pan find that single mothers spend less time with sons than daughters and report less emotional closeness with sons in early school years. Such a result suggests a parental investment variant of the Trivers-Willard hypothesis from evolutionary biology: parents who are maximizing reproductive success invest more in male offspring in good conditions but more in females in poor conditions (Trivers and Willard, 1973). Explicit attempts to test for evidence of Trivers-Willard patterns in modern families, however, have not found it to be well-supported (Keller, Nesse, and Hofferth, 2001).

Adolescent reports in Wave I about their relationships with parents, and particularly their mothers, do not show any evidence of such distinctive boy-girl responses to father absence (Table 6). Children in father-absent families are less likely to report that their parents care about them, their family generally has fun, their mothers are warm and loving towards them, and they are satisfied with their relationship with their mother, but there are no significant gender differences in these family structure effects.

C. Educational Attainment in Wave IV

Tables 7-9 report the effects of father absence in adolescence on several measures of educational attainment from Wave IV of the Add Health Study, when the respondents are in their late twenties and early thirties. Table 7 shows that being male has a large negative effect on the probability that an Add Health respondent receives a 4-year college degree by Wave IV. In the initial model with no other covariates, the college gender gap is 7 percent and controlling for mother's characteristics (Columns 2-8) has little effect on this gender gap. The coefficients on dummy variables for living in a family with no father figure or with a non-biological (step) father figure in Wave I also large and negative.

Non-traditional family structures do not, however, have differentially negative impacts on the college graduation rates of young men (column 3). The interaction effects, expected to be negative, are positive and insignificant. Column 4 decomposes the "no father" group into young adults who, though they did not live with their biological father at Wave I, did do so after the age of 5 (No Father Recently) and those who never lived with their father after age 5 (No Father Always). The latter status, as expected, has a larger negative association with college graduation but the gender interaction effects are once again positive, small and insignificant. Columns 6-8 report results from the core model for

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subsamples based on mother's education level, and the pattern is similar—negative effects of non-traditional family structures, but no evidence that the college graduation rates of men are more strongly affected by father absence than is college graduation by women.

Columns 1-3 in Table 8 show similar patterns in the determinants of high school graduation. Men are less likely to graduate from high school than women, living with no father or a step-father in Wave I has a strong negative association with graduation, and there is no significant differential effect of family structure for men. There is, however, a significantly larger impact of father absence before age 5 (No Father Always) on men's high school graduation, compared to women's. Columns 6-8 split the sample by mother's education and show that the effects of family structure on high school graduation are largely concentrated in families in which the mother had a high-school education or less. There is also a single, marginally-significant interaction term for the some college subsample—men with a mother who attended college but did not achieve a 4-year degree were more affected by father absence than similar women, in terms of their likelihood of graduating from high school.

Table 9 reports the results of key models for two alternative measures: years of completed education and a categorical measure of educational attainment that ranges from 0=less than high school to 5=post-graduate degree. The pattern of coefficients is very similar to that for college and for high-school graduation: substantial negative effects of being male and living without a father in adolescence, but no differential impacts of family structure by gender.

In general, the evidence from the Add Health cohorts of young adults strongly suggests that, though being male and living in a household without a biological father in adolescence are negatively associated with educational attainment, young men do not appear to be differentially affected by father absence when we focus on long-term outcomes such as college graduation. There is some limited evidence that high school graduation may be a hurdle for which father presence is more important for boys, however.[9]

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[9] In a fully-interacted model not reported here, mother's education does not have a significantly greater effect on the college graduation of boys, compared with girls. However, having a mother with at least a high-school education does have a stronger impact on a boy's probability of graduating from high school.

E. Additional Results

1. Fixed-effects estimates

     Table 10 reports family fixed-effects models of the key Wave I and Wave IV outcomes—the school problems index, depression index, and educational attainment—for a sample of mixed-sex siblings with the same mother and father who lived in the same household in Wave I. The sample consists of only 206 sibling pairs and trios, and there is a substantial loss in precision, though neither the OLS nor the fixed-effects estimates are very different from OLS estimates using the full sample. The excess sensitivity of girls to step-father presence persists in the within-family pattern of depression—girls in step-father households experience a larger increase in depression relative to those living with two biological parents than their brothers—but the interaction effect in the school problems model is not significant. The male-family structure interaction terms do not have significant effects on college graduation, years of education, or the categorical measure of education, but in this sibling sample father absence has a larger impact on high school graduation for boys than for girls.

2. Race

     The African-American sample in Add Health is much smaller than the non-Hispanic white sample, but the higher prevalence of non-traditional families in this population makes a parallel analysis of key outcomes on this subsample potentially informative. On some dimensions, the results reported in Table 11 contrast sharply with those from the majority sub-sample. Young black men are less likely to graduate from high school or college than young black women (and by larger margins than in the white sample) and no-father households are still associated with less education, more school problems, and a higher probability of school suspension. However, in important departures from the white sample results, there are no significant gender or family structure effects on college aspirations, and no family structure effects on the depression index. There is only one significant gender/family structure interaction, and it is a surprising one. The gender gap in school suspensions is smaller for adolescents in no-father families, rather than larger. In general, school discipline rates are much higher for black students, male and female, and the behavioral determinants appear to be very different as well. The differences between

the black and white samples on this dimension may be reflective of racial differences in the institutions of school discipline.

3. School Quality

The "male vulnerability" hypothesis has been studied primarily in terms of adolescent responses to family disadvantage, but Figlio, Karbownik, Roth, and Wasserman (2016) have also found that boys appear to be more sensitive than girls to variations in school quality in terms of test scores, absences, and suspensions. The Add Health Study includes a school administrator questionnaire that can be used to construct an index of school quality for the schools attended in Wave I. The components of the index are average daily attendance, class size, percentages of new and of experienced teachers, the percentage of teachers with a Masters' degree, the grade 12 dropout rates, the percentages of students with standardized achievement tests at, below, or above grade level, and the percentage of 12th graders that enrolled in a 2-year or 4-year college the next year. The models in Table 12 investigate whether the short-run and long-run outcomes of male students are more responsive to variations in school quality than outcome for female students.

The school quality index has a significant positive association with college and high school graduation and college aspirations, and a negative association with school suspensions. As with father absence, gender/school quality interactions effects for educational attainment are insignificant, and this is also the case in the models for school problems and depression. However, the gender gaps in the college attendance desires and expectations and in school suspensions are much smaller in high-quality schools. In terms of short-term attitudes to education and disciplinary problems, male students do appear to be more responsive to their school environment than female students though, as with father absence, these effects do not appear to have implications for eventual educational attainment, including high school and college graduation.

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IV. Conclusions

Using data on young cohorts of men and women from the National Longitudinal Study of Adolescent to Adult Health, I investigate the association between college graduation and father (and step-father) presence earlier in life. I find no evidence that father absence is associated with lower rates of college graduation for boys than for girls in either cross-sectional or family fixed-effect models. Girls appear more resilient to this element of family disadvantage when the outcomes are school problems, suspensions, and educational aspirations, while boys appear more resilient to father absence when we examine depression. Though these school-age outcomes are themselves associated with poor educational outcomes, these gender gaps related to father absence do not result in differential college graduation rates. The pattern of results is similar when boy/girl vulnerability to poor school quality, instead of father absence, is examined.

These mixed results—gender-specific behavioral responses to father absence among school children that do not result in gendered consequences for eventual educational attainment—suggest that previous findings of excess male vulnerability, while provocative, can be over-interpreted. Measures of problem behaviors in school often reflect gendered responses to disadvantage and they do not have clear implications for actual skill development in boys and girls or for eventual educational outcomes. Behavior in school is a consequence, not just of underlying skills and traits, but also of constraints and expectations that operate very differently for boys and girls due to gender norms in behavior on the part of parents, teachers, and the children themselves. Externalizing behavior that leads to problems in school is much more prevalent among boys, while internalizing behavior, which includes anxiety and depression, is a more common response to stress for girls, but is not included in the survey and administrative data used in prior studies. Most of the socio-behavioral outcomes examined in other studies, such as kindergarten readiness and school suspensions, are related to externalizing behavior and so suggest greater male vulnerability to disadvantage. This analysis of Add Health data, though consistent with these earlier studies, finds no evidence supporting the hypothesis that changes in family structure have contributed to the growing gender gap in college graduation.

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Figure 1: College Graduation Rates and Male/Female Graduation Ratio
White Non-Hispanic sample, Add Health

Note: The "No Dad" and "Other Dad" ratios are not significantly different from the "Biological Dad" ratio.
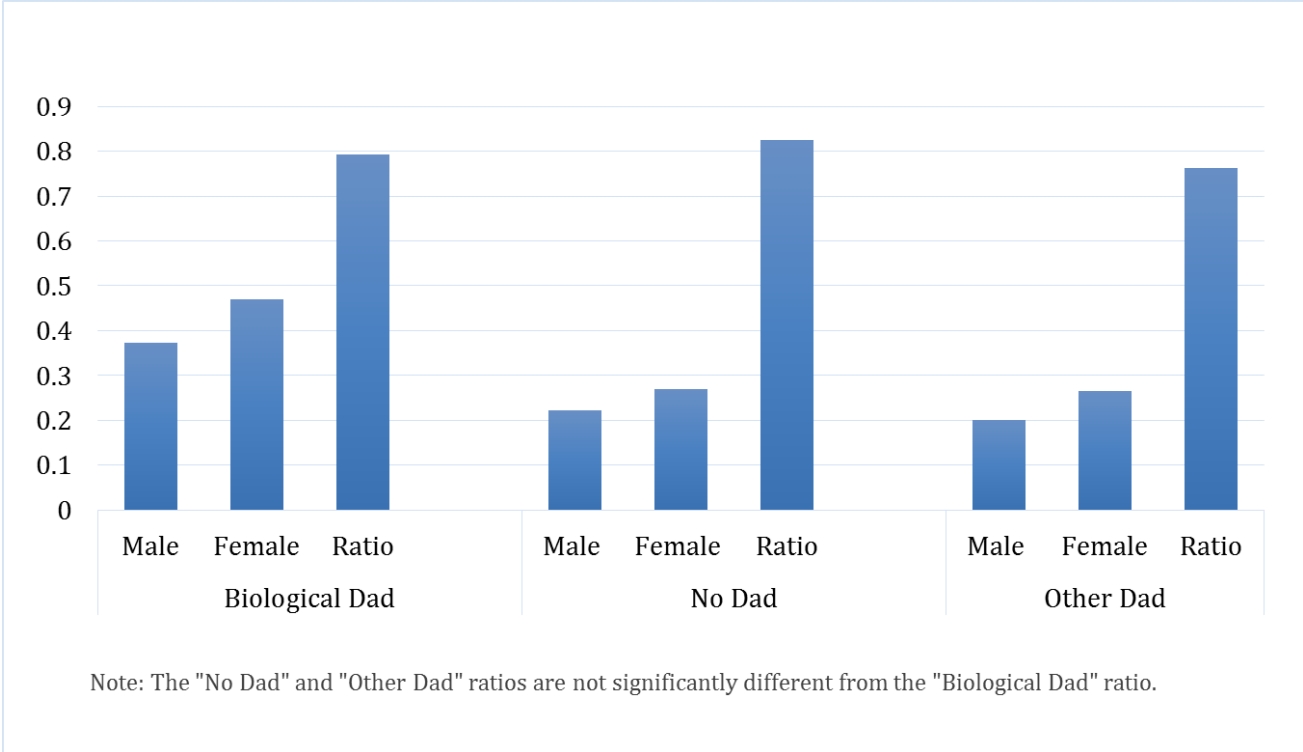
Table 1: Father Absence in Add Health, Wave I

	All	White	Black	Hispanic	Male	Female
Living with Biological or Adoptive Father	.626	.680	.354	.624	.643	.610
No Father	.279	.222	.562	.289	.264	.293
Step- or Other Father	.095	.099	.085	.088	.094	.097
Observations	12,176	7,473	2,783	2,106	5,625	6,551

Sample consists of all respondents living with biological mother in Wave I. Wave I sample weights.

Table 2: Selection of Boys and Girls Across Household Types—Non-Hispanic White Sample Living with Bio-mom in Wave I

	Biological Father			Other Father			No Father		
	Girl Mean	Boy Mean	t-test p-value	Girl Mean	Boy Mean	t-test p-value	Girl Mean	Boy Mean	t-test p-value
Mother's education									
High School	.435	.432	0.81	.454	.510	0.13	.419	.423	0.86
Some College	.178	.200	0.04	.237	.224	0.67	.223	.221	0.96
College Graduate	.294	.290	0.76	.183	.146	0.17	.214	.219	0.82
Mother foreign-born	.035	.039	0.48	.013	.025	0.22	.030	.024	0.41
Young mother (<22)	.107	.110	0.71	.296	.311	0.67	.217	.199	0.37
Family income	51.2	49.2	0.22	44.8	45.2	0.93	25.7	31.1	0.005
Low birth weight	.071	.064	0.32	.077	.059	0.32	.080	.073	0.62
N	2,568	2,396		388	357		912	709	

"Biological Father," "No Father" and "Other Father" refer to living arrangements at Wave I. Family income is annual income from all sources in thousands of 1994 dollars. Low birth weight is less than 88 oz.
p values from t-test for equal means.

Table 3: Wave I Outcomes, School Problems Index and Components

VARIABLES	(1) School Problems Index	(2) Absences	(3) Ever Suspended from School	(4) Trouble Getting Along with Teachers	(5) Trouble Paying Attention in School	(6) Trouble Getting Homework Done	(7) Trouble Getting Along with Students
Male	0.260***	0.179	0.134***	0.246***	0.116***	0.191***	0.154***
	(0.038)	(0.230)	(0.014)	(0.038)	(0.037)	(0.045)	(0.034)
No Father	0.171***	0.850**	0.095***	0.098*	0.107*	0.111**	0.0915
	(0.057)	(0.407)	(0.018)	(0.050)	(0.056)	(0.054)	(0.058)
Other Father	0.143**	0.233	0.0309	0.0392	0.0558	0.189**	0.138**
	(0.070)	(0.356)	(0.019)	(0.066)	(0.067)	(0.093)	(0.064)
Male*No Father	0.183**	1.047	0.0817**	0.074	0.182**	0.148*	-0.0247
	(0.079)	(0.642)	(0.027)	(0.069)	(0.080)	(0.084)	(0.065)
Male*Other Father	0.0556	0.250	0.0790**	-0.0038	0.156	-0.012	-0.144
	(0.089)	(0.444)	(0.037)	(0.094)	(0.097)	(0.120)	(0.099)
Constant	-0.994***	-12.85***	-0.488***	2.094***	-0.371	-0.397	2.404***
	(0.354)	(2.096)	(0.142)	(0.267)	(0.327)	(0.347)	(0.305)
Observations	7,172	7,172	7,172	7,172	7,172	7,172	7,172
R-squared	0.051	0.049	0.115	0.034	0.030	0.029	0.022
Mother's characteristics	YES	YES	YES	YES	YES	YES	YES
Mean of dependent variable	.0004	1.686	.202	.862	1.313	1.220	.884

Standard errors clustered by school in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$
"No Father" and "Other Father" refer to living arrangements at Wave I. "School problems" is a standardized index based on factor analysis of the other variables in this table. "Absences" is student-reported absences without excuse in past year, "trouble" variables from student-reported experiences from 0=never to 4=every day. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 4: Wave I Outcomes, Depression Index and Items

	(1) Depression Index	(2) Hopeful about Future	(3) Can't Shake Blues	(4) Depressed	(5) Happy	(6) Lonely	(7) Sad
Male	-0.237***	0.0439	-0.142***	-0.162***	-0.0258	-0.128***	-0.173***
	(0.030)	(0.030)	(0.020)	(0.023)	(0.033)	(0.023)	(0.022)
No Father	0.179***	-0.0314	0.125***	0.162***	-0.0687*	0.0615**	0.0709**
	(0.049)	(0.045)	(0.031)	(0.035)	(0.039)	(0.030)	(0.034)
Other Father	0.259***	-0.0202	0.209***	0.171**	-0.0639	0.1089*	0.128**
	(0.096)	(0.070)	(0.071)	(0.067)	(0.065)	(0.051)	(0.061)
Male*No Father	-0.0073	-0.0593	-0.0355	-0.102**	-0.0026	0.0100	-0.002
	(0.066)	(0.072)	(0.052)	(0.043)	(0.068)	(0.046)	(0.042)
Male*Other Father	-0.193*	-0.0015	-0.178**	-0.147**	0.0225	0.0098	-0.133*
	(0.115)	(0.099)	(0.077)	(0.071)	(0.091)	(0.068)	(0.079)
Constant	-1.635***	0.908***	-0.603***	-0.585***	3.0540***	-0.805***	-0.179
	(0.263)	(0.264)	(0.153)	(0.191)	(0.269)	(0.154)	(0.170)
Observations	7,172	7,172	7,172	7,172	7,172	7,172	7,172
R-squared	0.058	0.020	0.042	0.051	0.019	0.028	0.036
Mother's characteristics	YES	YES	YES	YES	YES	YES	YES
Mean of dependent variable	-.010	1.873	.359	.483	2.189	.418	.532

Standard errors clustered by school in parentheses. *** p<0.01, ** p<0.05, * p<0.1
"No Father" and "Other Father" refer to living arrangements at Wave I. "Depression Index" is the CES-D depression scale (standardized) based on 19 items, including the other variables in this table. Each item is based on responses to "How often have you felt this way during the past week?" ranging from 0=never or rarely to 3=most/all of the time. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 5: Wave I Outcomes, Grades and Aspirations

VARIABLES	(1) English Grade	(2) Math Grade	(3) Wants to Attend College	(4) Expects to Attend College
Male	-0.366***	-0.096**	-0.141***	-0.214***
	(0.032)	(0.039)	(0.031)	(0.033)
No Father	-0.253***	-0.201***	-0.006	-0.156***
	(0.053)	(0.052)	(0.043)	(0.049)
Other Father	-0.085	-0.146	0.0319	-0.029
	(0.064)	(0.088)	(0.061)	(0.076)
Male*No Father	0.043	-0.0211	-0.140**	-0.0975
	(0.077)	(0.072)	(0.064)	(0.073)
Male*Other Father	0.018	0.092	-0.076	-0.107
	(0.097)	(0.118)	(0.100)	(0.107)
Constant	3.509***	3.986***	1.422***	0.0380
	(0.335)	(0.378)	(0.268)	(0.2881)
Observations	7,037	6,723	7,172	7,172
R-squared	0.091	0.038	0.085	0.128
Mother's characteristics	YES	YES	YES	YES
Mean of dependent variable	2.919	2.791	.013	.012

Standard errors clustered by school in parentheses. *** p<0.01, ** p<0.05, * p<0.1
"No Father" and "Other Father" refer to living arrangements at Wave I. Grades are student-reported
and range from 1=D or lower to 4=A. College desires/expectations are standardized measures based on a
0-4 scale.   Mother's characteristics include education and dummies for foreign-born and young mother
(under 22). All models include birth cohort.

Table 6: Mechanisms, Adolescent Self-Reports about Relationship with Parent/s

VARIABLES	(1) Parents Care About Me	(2) Family Has Fun	(3) Mother Warm and Loving	(4) Satisfied with Relationship with Mother
Male	0.0002	0.061*	0.090***	0.157***
	(0.016)	(0.036)	(0.024)	(0.028)
No Father	-0.060**	-0.149***	-0.138***	-0.134***
	(0.024)	(0.046)	(0.040)	(0.049)
Other Father	-0.0428	-0.226***	-0.107*	-0.027
	(0.038)	(0.074)	(0.061)	(0.066)
Male*No Father	0.002	-0.046	0.029	0.047
	(0.037)	(0.079)	(0.052)	(0.058)
Male*Other Father	0.0037	0.0123	0.118	0.0547
	(0.047)	(0.087)	(0.073)	(0.077)
Constant	5.389***	6.172***	4.492***	5.318***
	(0.105)	(0.258)	(0.175)	(0.217)
Observations	7,163	7,160	7,169	7,170
R-squared	0.012	0.038	0.025	0.037
Mother's characteristics	YES	YES	YES	YES
Mean of dependent variable	4.82	3.72	3.42	3.29

Standard errors clustered by school in parentheses.   *** p<0.01, ** p<0.05, * p<0.1
"No Father" and "Other Father" refer to living arrangements at Wave I. Dependent variables are measured on a 1-5 scale (col. 1 and 2) or a 0-4 scale (col 3 and 4) from "strongly disagree" to "strongly agree". Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 7: College Graduation by Wave I Living Arrangements, Non-Hispanic White Sample

	(1)	(2)	(3)	(4)	(5)	(6) Mother High School	(7) Mother Some College	(8) Mother College Grad
			Living with Bio-mom in Wave I					
Male	-0.070***	-0.077***	-0.089***	-0.078***	-0.089***	-0.060***	-0.091**	-0.136***
	(0.017)	(0.015)	(0.018)	(0.0145)	(0.018)	(0.021)	(0.049)	(0.034)
No Father		-0.130***	-0.149***			-0.129***	-0.133***	-0.235***
		(0.017)	(0.021)			(0.024)	(0.047)	(0.056)
Other Father		-0.108***	-0.126***	-0.108***	-0.127***	-0.107***	-0.0958	-0.207***
		(0.0195)	(0.026)	(0.019)	(0.026)	(0.033)	(0.064)	(0.067)
Male*No Father			0.040			0.0351	-0.0212	0.069
			(0.030)			(0.036)	(0.083)	(0.075)
Male*Other Father			0.0365		0.0364	0.0229	0.00945	0.0800
			(0.042)		(0.042)	(0.046)	(0.096)	(0.101)
No Father Recently				-0.090***	-0.106***			
				(0.021)	(0.028)			
No Father Always				-0.175***	-0.192***			
				(0.020)	(0.023)			
Male*No Father Recently					0.0325			
					(0.042)			
Male*No Father Always					0.037			
					(0.033)			
Constant	0.155	-0.128	-0.123	-0.109	-0.105	-0.00262	-0.0194	0.590**
	(0.217)	(0.168)	(0.168)	(0.167)	(0.167)	(0.204)	(0.299)	(0.261)
Observations	7,327	7,327	7,327	7,327	7,327	3,932	1,468	1,922
R-squared	0.006	0.170	0.171	0.172	0.172	0.037	0.038	0.063
Mother's characteristics	NO	YES	YES	YES	YES	YES	YES	YES
Mean of dependent variable	.368	.368	.368	.368	.368	.273	.362	.643

Standard errors clustered by school in parentheses. *** p<0.01, ** p<0.05, * p<0.1
"No Father" and "Other Father" refer to living arrangements at Wave I. "No Father Always" means the adolescent has not lived with his/her biological father since the age of 5. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 8: High School Graduation by Wave I Living Arrangements, Non-Hispanic White Sample

	(1)	(2)	(3)	(4)	(5)	(6) Mother High School	(7) Mother Some College	(8) Mother College Grad
			Living with Bio-mom in Wave I					
Male	-0.025***	-0.029***	-0.024***	-0.029***	-0.024***	-0.026*	-0.011	-0.014**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.015)	(0.013)	(0.006)
No Father		-0.049***	-0.034**			-0.059***	-0.026	-0.012
		(0.011)	(0.013)			(0.021)	(0.018)	(0.001)
Other Father		-0.029**	-0.038**	-0.029**	-0.038***	-0.066**	0.0011	0.001
		(0.012)	(0.018)	(0.012)	(0.018)	(0.032)	(0.018)	(0.002)
Male*No Father			-0.033			-0.030	-0.072*	-0.002
			(0.020)			(0.029)	(0.045)	(0.026)
Male*Other Father			0.017		0.017	0.043	-0.017	-0.020
			(0.027)		(0.027)	(0.048)	(0.036)	(0.031)
No Father Recently				-0.035**	-0.029*			
				(0.014)	(0.016)			
No Father Always				-0.065***	-0.038*			
				(0.016)	(0.020)			
Male*No Father Recently					-0.012			
					(0.024)			
Male*No Father Always					-0.060*			
					(0.033)			
Constant	0.796***	0.610***	0.607***	0.616***	0.612	0.761***	0.809***	0.906***
	(0.0859)	(0.0780)	(0.0774)	(0.0774)	(0.0788)	(0.117)	(0.126)	(0.0496)
Observations	7,327	7,327	7,327	7,327	7,327	3,932	1,468	1,922
R-squared	0.003	0.079	0.080	0.080	0.081	0.023	0.032	0.012
Mother's characteristics	NO	YES	YES	YES	YES	YES	YES	YES
Mean of dependent variable	.935	.935	.935	.935	.935	.930	.958	.988

Standard errors clustered by school in parentheses. *** p<0.01, ** p<0.05, * p<0.1
"No Father" and "Other Father" refer to living arrangements at Wave I. "No Father Always" means the adolescent has not lived with his/her biological father since the age of 5. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 9: Educational Attainment by Wave I Living Arrangements, Non-Hispanic White Sample

	(1)	(2)	(3	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Years of Completed Education					Categorical Educational Attainment: Ordered Logit				
			Mother High School	Mother Some College	Mother College Grad			Mother High School	Mother Some College	Mother Some College
Male	-0.556***	-0.614***	-0.489***	-0.478**	-0.870***	-0.411***	-0.503***	-0.430***	-0.375**	-0.634***
	(0.0897)	(0.0974)	(0.119)	(0.229)	(0.169)	(0.0668)	(0.0769)	(0.0943)	(0.175)	(0.130)
No Father		-0.743***	-0.714***	-0.642***	-1.058***		-0.538***	-0.490***	-0.539***	-0.824***
		(0.113)	(0.136)	(0.239)	(0.304)		(0.0901)	(0.108)	(0.181)	(0.226)
Other Father		-0.801***	-0.658***	-0.528*	-1.423***		-0.555***	-0.356**	-0.510**	-1.053***
		(0.130)	(0.194)	(0.303)	(0.294)		(0.110)	(0.175)	(0.249)	(0.232)
Male*No Father		-0.0675	0.0009	-0.470	-0.126		-0.151	-0.135	-0.450	-0.0975
		(0.166)	(0.196)	(0.432)	(0.402)		(0.137)	(0.161)	(0.359)	(0.310)
Male*Other Father		0.301	0.297	-0.188	0.656		0.203	0.0971	0.0789	0.542
		(0.212)	(0.280)	(0.419)	(0.436)		(0.169)	(0.240)	(0.357)	(0.337)
Constant	11.85***	9.961***	11.43***	10.97***	13.06***					
	(1.139)	(0.897)	(1.134)	(1.565)	(1.217)					
Observations	7,327	7,327	3,932	1,468	1,922	7,327	7,327	3,932	1.468	1,922
R-squared	0.014	0.199	0.049	0.056	0.076					
Mother's characteristics	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES
Mean of dependent variable	14.14	14.14	13.36	14.22	15.66	2.54	2.54	2.08	2.63	3.43

Standard errors clustered by school in parentheses. *** p<0.01, ** p<0.05, * p<0.1
"No Father" and "Other Father" refer to living arrangements at Wave I. "Years of education" range from 10 to 20 years. "Categorical Educational Attainment" is a discrete measure ranging from 0=less than high school to 5=post-graduate degree. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 10: Wave I Outcomes and Educational Attainment, Non-Hispanic White Sibling Sample, OLS and Fixed Effects

	(1) School Problems Index		(2) Depression Index		(3) College Graduation		(4) High School Graduation		(5) Years of Education		(6) Categorical Educational Attainment	
	OLS	Fixed effects	OLS	Fixed effects	OLS	Fixed effects	OLS	Fixed effects	OLS	Fixed effects	OLS	Fixed effects
Male	0.363***	0.351**	-0.243*	-0.245	-0.0720	-0.0814	0.0300	0.0258	-0.454	-0.524**	-0.294*	-0.323**
	(0.128)	(0.169)	(0.128)	(0.154)	(0.0514)	(0.0508)	(0.0405)	(0.0412)	(0.307)	(0.261)	(0.169)	(0.150)
Male*No Father	0.263	0.481	-0.0016	0.163	0.0626	0.0482	-0.194	-0.224*	-0.453	-0.597	-0.302	-0.391
	(0.552)	(0.319)	(0.395)	(0.381)	(0.145)	(0.115)	(0.119)	(0.131)	(0.861)	(0.649)	(0.483)	(0.430)
Male*Other Father	0.587	0.511	-0.436**	-0.494*	-0.0150	-0.0155	0.0101	0.0249	-0.439	-0.396	-0.167	-0.149
	(0.375)	(0.342)	(0.184)	(0.284)	(0.104)	(0.115)	(0.0979)	(0.117)	(0.528)	(0.657)	(0.429)	(0.424)
Constant	0.130	-0.0663	0.0823	-0.0581	0.0536	0.367***	0.866***	0.941***	12.53***	14.07***	1.515***	2.539***
	(0.191)	(0.0836)	(0.166)	(0.0730)	(0.0613)	(0.0253)	(0.0678)	(0.0247)	(0.317)	(0.106)	(0.190)	(0.0686)
Observations	420	420	430	430	430	430	430	430	430	430	430	430
R-squared	0.055	0.090	0.044	0.054	0.204	0.024	0.044	0.045	0.188	0.073	0.231	0.075
Number of families		206		206		206		206		206		206

OLS models: Standard errors clustered by school in parentheses. Sample excludes same-sex sibling pairs. *** p<0.01, ** p<0.05, * p<0.1

"No Father" and "Other Father" refer to living arrangements at Wave I. "School problems" is a standardized index from factor analysis of variables including absences, suspensions, and student reports of trouble at school. "Depression" is the CES-D depression scale (standardized) based on 19 items.

"Years of education" range from 10 to 20 years. "Categorical Educational Attainment" is a discrete measure ranging from 0=less than high school to 5=post-graduate degree. All models control for mother's age at birth and first-born. OLS models also include mother's education and household type.

Table 11: Educational Attainment and Wave I Outcomes—Black Sample

VARIABLES	(1) College Graduation	(2) High School Graduation	(3) School Problems Index	(4) Ever Suspended from School	(5) Depression Index	(6) Want to Attend College	(7) Expects to Attend College
Male	-0.137***	-0.0495***	0.195**	0.240***	-0.325***	-0.0808	-0.112
	(0.0330)	(0.0184)	(0.0903)	(0.0346)	(0.102)	(0.0736)	(0.0918)
No Father	-0.0984***	-0.0677***	0.162**	0.145***	0.0430	-0.0337	-0.0324
	(0.0287)	(0.0195)	(0.0730)	(0.031)	(0.0986)	(0.0683)	(0.0841)
Other Father	-0.0976*	-0.0312	0.185	0.160***	0.0374	-0.0996	-0.120
	(0.0527)	(0.0343)	(0.133)	(0.0580)	(0.131)	(0.136)	(0.175)
Male*No Father	0.0396	-0.0138	-0.0423	-0.125***	-0.0503	0.0012	-0.0787
	(0.0447)	(0.0302)	(0.114)	(0.0463)	(0.128)	(0.0976)	(0.114)
Male*Other Father	-0.0238	-0.0364	0.0200	-0.0829	0.223	-0.279	-0.258
	(0.0560)	(0.0639)	(0.209)	(0.0875)	(0.203)	(0.218)	(0.249)
Constant	0.202	0.510**	-0.863	0.223	-1.206**	1.766***	1.048**
	(0.244)	(0.243)	(0.591)	(0.259)	(0.466)	(0.526)	(0.484)
Observations	2,634	2,634	2,634	2,634	2,634	2,634	2,634
R-squared	0.166	0.060	0.030	0.085	0.061	0.041	0.067
Mother's characteristics	YES	YES	YES	YES	YES	YES	YES
Mean of dependent variable	0.299	0.921	-0.001	0.398	-0.012	0.015	0.013

Standard errors clustered by school in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$
"No Father" and "Other Father" refer to living arrangements at Wave I. "School problems" is a standardized index from factor analysis of variables including absences, suspensions, and student reports of trouble at school. "Depression" is the CES-D depression scale (standardized) based on 19 items. College desires/expectations are measured on a 0-5 scale. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table 12: School Quality Effects on Educational Attainment and Wave I Outcomes, Non-Hispanic White Sample

	(1) College Graduation	(2) High School Graduation	(3) School Problems Index	(4) Ever Suspended from School	(5) Depression Index	(6) Wants to Attend College	(7) Expects to Attend College
Male	-0.077***	-0.034***	0.267***	0.177***	-0.286***	-0.244***	-0.295***
	(0.018)	(0.008)	(0.037)	(0.013)	(0.034)	(0.035)	(0.030)
School Quality Index	0.059***	0.018***	-0.016	-0.031***	-0.0161	0.056**	0.094***
	(0.021)	(0.007)	(0.026)	(0.013)	(0.027)	(0.026)	(0.025)
Male*School Quality Index	0.006	0.0124	-0.025	-0.032***	-0.0128	0.083**	0.086***
	(0.017)	(0.008)	(0.031)	(0.016)	(0.033)	(0.036)	(0.026)
Constant	-0.158	0.536***	-0.693**	-0.295*	-1.236***	-0.129	-1.619**
	(0.198)	(0.099)	(0.441)	(0.165)	(0.317)	(0.894)	(0.738)
Observations	5,468	5,468	5,468	5,468	5,468	5,468	5,468
R-squared	0.150	0.067	0.029	0.110	0.041	0.087	0.140
Mothers characteristics	YES	YES	YES	YES	YES	YES	YES
Mean of dependent variable	.379	.947	.000	.216	.000	.000	.000

Standard errors clustered by school in parentheses. *** p<0.01, ** p<0.05, * p<0.1

"School Quality" is a standardized index based on school administrator reports of average daily attendance, class size, % of new and experienced teachers, % of teachers with a Masters' degree, grade 12 dropout rates, % of students with achievement tests below and above grade level, and % of 12th graders enrolled in college next year. "School problems" is a standardized index from factor analysis of variables including absences, suspensions, and student reports of trouble at school. "Depression" is the CES-D depression scale (standardized) based on 19 items. College desires/expectations are measured on a 0-5 scale. Mother's characteristics include education and dummies for foreign-born and young mother (under 22). All models include birth cohort.

Table A1: Summary statistics, White Non-Hispanic sample, Add Health Wave I

	White Non-Hispanic		Different-sex siblings	
	Men	Women	Men	Women
Family Background				
No Father	0.205	0.236	0.155	0.152
No Father Recently	0.110	0.114	0.0986	0.0876
No Father Always	0.095	0.122	0.0610	0.0599
Other Father	0.103	0.100	0.0845	0.0829
Mother High School	0.438	0.433	0.404	0.426
Mother Some College	0.207	0.194	0.251	0.230
Mother College Graduate	0.260	0.264	0.232	0.230
Young Mother	0.149	0.152	0.141	0.138
Foreign Mother	0.034	0.032	0.0329	0.0369
Child Outcomes				
High School Graduate (Wave IV)	0.920	0.948	0.915	0.940
College Graduate (Wave IV)	0.326	0.405	0.305	0.401
School Problems Index	0.160	-0.142	0.301	-0.0994
Unexcused Absences	1.964	1.436	2.290	2.338
Ever Been Suspended	0.288	0.125	0.300	0.157
Trouble with Teachers	0.988	0.750	1.086	0.876
Trouble Paying Attention	1.411	1.226	1.657	1.233
Trouble Doing Homework	1.341	1.111	1.467	1.110
Trouble with Other Students	0.936	0.837	1.052	0.905
Depression Index	-0.141	0.108	-0.277	0.0259
Hopeful	1.901	1.849	1.765	1.862
Can't Shake Blues	0.269	0.440	0.305	0.456
Depressed	0.387	0.570	0.338	0.636
Happy	2.171	2.204	2.160	2.138
Lonely	0.355	0.474	0.282	0.581
English Grade	2.720	3.097	2.691	3.083
Math Grade	2.734	2.844	2.733	2.829
Expect to Attend College	-0.129	0.141	-0.181	0.137
Want to Attend College	-0.104	0.115	-0.229	0.123
Observations	3459	3868	213	217