Gains and Gaps:
Changing Inequality in U.S. College Entry and Completion

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Abstract

We describe changes over time in inequality in postsecondary education using nearly seventy years of data from the U.S. Census and the 1979 and 1997 National Longitudinal Surveys of Youth. We find growing gaps between children from high- and low-income families in college entry, persistence, and graduation. Rates of college completion increased by only four percentage points for low-income cohorts born around 1980 relative to cohorts born in the early 1960s, but by 18 percentage points for corresponding cohorts who grew up in high-income families. Among men, inequality in educational attainment has increased slightly since the early 1980s. But among women, inequality in educational attainment has risen sharply, driven by increases in the education of the daughters of high-income parents. Sex differences in educational attainment, which were small or nonexistent thirty years ago, are now substantial, with women outpacing men in every demographic group. The female advantage in educational attainment is largest in the top quartile of the income distribution. These sex differences present a formidable challenge to standard explanations for rising inequality in educational attainment.

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I. Introduction

Postsecondary education is a key path to upward mobility in the United States. For this reason, understanding recent trends in college going and college graduation for children from different family backgrounds is critical to understanding how increases in family income inequality affect the life chances of children born into low-income families. In this paper we document changes over time in inequality in educational attainment by family income, and examine the extent to which trends vary by gender. We focus in particular on the thirty years since 1980, in which we find growing income gaps in college entry, persistence, and completion.

We find increasing advantages for children growing up in high-income families. On all three attainment dimensions we track – college entry, persistence and completion – cohorts born between 1979 and 1982 attained more than cohorts born between 1961 and 1964. However, the attainment advantages for the latter cohorts were larger for children raised in high- as opposed to low-income families. A new and puzzling finding is that these increases in educational inequality are driven largely by women. Among men, inequality in educational attainment by family income has increased much less than it has among women. For example, the gap between the top and bottom quartiles in college entry increased by fifteen percentage points among women but by seven percentage points among men. This difference is driven by sharp increases in the education of daughters of high-income parents.

Sex differences in educational attainment, which were small or nonexistent thirty years ago, are now substantial, with women outpacing men in every income group. The female advantage in educational attainment is largest in the top quartile of the income distribution. These findings present a formidable challenge to standard explanations for rising inequality in educational attainment. Girls and boys are raised in the same families, attend the same

elementary and secondary schools, and face the same college prices. Given that inequality has risen primarily among women, widening inequality in parental income, changes in school quality and organization, and rising tuition prices are candidate explanations for increases in the inequality in educational attainment if and only if these shocks differentially affect the educational attainment of men and women. An alternative (and potentially complementary) explanation is that men and women operate in segregated labor markets and asymmetric marriage markets and, therefore, face different returns to human capital. Since current inequalities between men and women in educational attainment were foreshadowed seventy years ago, policymakers and researchers may want to look beyond current events and trends to understand today's educational inequality.

From a policy and research perspective, our main findings indicate that we cannot focus solely on the college entry margin if we wish to understand the sources of, and remedies for, inequality in postsecondary attainment. Differences in high school completion between children from low-income families and those from high-income families explain half of the gap in college entry. However, among those who enter college, children from low-income families are much less likely to get a degree. Inequality in college persistence, therefore, produces inequality in college completion, even if college-entry rates were equal (which they are not).

II. Historical Trends in College Entry and Completion

To provide context for our examination of trends in college going and college completion by family income, we begin by documenting changes in educational attainment between 1940 and 2007. We focus on trends in three outcomes. We define the college entry rate as the share of each birth cohort that has any college experience by age nineteen or is in school at age nineteen; this experience could consist of less than one year of course work. The share of a cohort that

completes a bachelor's degree (B.A.) by age twenty-five is referred to as the college completion rate.[1] The college completion rate divided by the entry rate provides a measure of the share of college entrants who go on to graduate, which we refer to as the college persistence rate.

Our data sources are the U.S. decennial censuses from 1940 to 2000 and the American Community Surveys (ACS) for 2006 and 2007 (Ruggles et al. 2009). We focus on the native-born population. The census and ACS have two key advantages over other data sources. First, they provide a sixty-seven-year perspective on college entry and completion of young people. Second, they cover a broader population than, in particular, the Current Population Survey (CPS), by including residents of dormitories, barracks, and prisons. This is especially important when measuring differences across demographic groups in educational attainment, since young men, especially black men, are disproportionately likely to live in barracks and prisons. Although we can track black-white differences in educational attainment for the entire period under analysis, we can only provide reliable statistics for Hispanics as of 1980, when the census began to explicitly ask about "Hispanic origin" on the enumeration form. In any long-term analysis, changes in variable definitions can make it difficult to distinguish real changes in behavior from changes in measurement. These measurement issues are discussed in more detail in the data appendix.

College Entry and Completion since 1940

Rates of college entry and completion increased dramatically over the last seventy years. As illustrated in Figure 1 (top line), from 1940 to 2007 (cohorts born between 1921 and 1988), college entry increased by roughly 50 percentage points—an average of 7.6 percentage points

[1] There is a growing divergence between completion rates at ages twenty-five and thirty-five, reflecting the increasing tendency of youths to leave college and return later to complete their B.A.s (Turner 2004). This trend is especially pronounced among women.

per decade. College completion by age twenty-five among cohorts born between 1915 and 1983 more than quadrupled.[2] Whereas only 6 to 7 percent of those born in 1915 graduated from college, 28 percent of those born in 1975 would graduate by age twenty-five.[3] A key question for this paper is whether the trends in college entry and completion illustrated in Figure 1 pertain to children from low-income families as well as to children from high-income families. It is to this question that we now turn.

For this analysis, we use detailed longitudinal data from the NLSY79 and NLSY97 (National Longitudinal Survey of Youth 1979 and 1997) and focus on educational attainment by family income quartiles for recent birth cohorts. These data sets allow us to examine the link between parental income and children's educational attainment, and how it has changed over time. We focus on two cohorts: those born in 1961 through 1964 (NLSY79, early cohort) and those born in 1979 through 1982 (NLSY97, later cohort). On-time graduation from high school for these cohorts would have been in 1979 through 1982 and 1997 through 2000, respectively. The sample is limited to respondents for whom we have information about grade attainment at both age nineteen and age twenty-five.[4]

Figure 2 shows the college entry rates for the two cohorts, plotted separately by household-income quartile, and Figure 3 shows the analogous college completion rates.

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[2] The post-1980 censuses and the ACS record whether a person has "some college" or completed a degree, but earlier censuses ask only about highest grade completed. To the extent that earlier censuses overstate college completion, this change in definition will tend to understate changes in college completion for the affected cohorts.

[3] In unreported results, we find that the March Current Population Survey (CPS) matches the census closely: the CPS understates college completion by age twenty-five by less than one and a half percentage points; graduation by age thirty-five is identical for the 1955 cohort forward. The NLSY, however, appears to overstate college completion slightly: graduation rates by age twenty-five are three percentage points higher for the 1965 cohort in the NLSY79 and six percentage points for the 1982 cohort in the NLSY97.

[4] In NLSY79, 89 percent of those providing grade-attainment information at age nineteen also do so at twenty-five. For NLSY97, the figure is 95 percent.

Household income is measured at the time of each baseline survey, when children were fifteen to eighteen years old. One pattern evident in the figures is that, for both cohorts, higher family income is associated with a greater probability that a child will enter and will graduate from college. A second pattern evident in Figures 2 and 3 is that the college entry rate and the college completion rate rose between the two periods. However, the increases were highly uneven, with gains largest at the top of the income distribution and smallest at the bottom.[5] Specifically, the top two quartiles boosted their college entry rates by about twenty-two percentage points, to 80 percent in the top quartile and 60 percent in the next highest quartile. In the bottom quartile, the college entry rate rose just ten percentage points, from 19 to 29 percent. A result is that the gap in the college entry rate between the bottom- and top-income quartiles increased from thirty-nine to fifty-one percentage points. The story is similar for college completion, with the top-income quartile gaining an astounding eighteen percentage points but the bottom quartile nudging up only slightly to nine from five percent. The product of this uneven growth was increased inequality in college outcomes during a period in which educational attainments became increasingly strong determinants of subsequent earnings.

Together these facts about college entry and completion provide insight into income differences in college persistence (Figure 4). For both cohorts, the persistence rate rises with income, with those in the top quartile more than twice as likely to graduate as those in the bottom quartile. Persistence rates rose slightly (six percentage points) in the bottom and top two quartiles, and just one percentage points in the second quartile. The relationship between income and persistence, therefore, remained quite strong. This pattern implies that equal increases in college entry will generate highly unequal increases in college completion.

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[5] Belley and Lochner (2007) reach a similar conclusion in their analysis of these data.

Sex Differences in Inequality in College Entry and Completion

A striking aspect of the increase in inequality in college outcomes by income group is that it is primarily a female phenomenon. In college entry, persistence, and completion, women in the top-income quartile have pulled away from the rest of population. In the later cohort, an astounding 85 percent of women in the top quartile entered college. The gap between the top- and bottom-income quartiles in college entry rose by fifteen percentage points among women. The comparable increase for men is seven percentage points. The pattern in completion is similar, with the gap between the top and bottom quartiles rising by seventeen percentage points among women and eleven percentage points among men.

Figure 5 plots the difference between males and females in college completion rates by family income quartile for the two cohorts. In the early cohort, there are few differences between the sexes: there is a slight female advantage of two percentage points in the top quartile and a slight disadvantage of two to three percentage points in the bottom three quartiles. Within the later cohort, a female advantage opened in every quartile, with the largest in the top. In the top quartile, the female advantage opened to thirteen percentage points, whereas in the bottom it was just three percentage points.

The evidence from the two NLSY cohorts reveals two striking patterns. The first is that inequality in college outcomes by family income increased dramatically in recent decades. The second is that the increase in inequality is largely driven by the increase in college enrollment and completion among women from higher-income families. The female advantage in college graduation rose substantially in the top quartile, to thirteen percentage points (from two). A female disadvantage of two percentage points in the bottom quartile switched to an advantage of two percentage points. The patterns in the NLSY data sets raise two questions: When did the

female advantage in achieving college outcomes begin? Is the answer different for different racial/ethnic groups? To answer these questions we return to evidence from the census.

Figure 6 shows the female advantage in college entry and college completion for cohorts born between 1915 and 1985. One striking pattern is that the female advantage is not a new phenomenon. In fact, the advantage in college entry is present for all cohorts born after 1950 and grew in magnitude over the last half of the twentieth century. For the most recent cohorts that have reached college-going age, the share of women who enroll in college (71 percent) is ten percentage points greater than the share of men who do so (61 percent). The female advantage in college completion has trended similarly, although it has lagged behind college entry. For cohorts born after 1965, the percentage of women who graduated college by the age of twenty-five is greater than the comparable figure for men. For the most recent cohorts, the four-year college graduation rate for women (32 percent) is ten points higher than the comparable rate for males (22 percent).[6]

Figure 7 shows the trends in the female advantage in college completion for the major racial and ethnic groups.[7] Notice that the female advantage in college completion began much earlier for blacks than for non-Hispanic whites. In fact, for all cohorts born after 1915, the college graduation rate for black women was higher than that for black men. This female advantage in college completion among blacks was modest (less than three percentage points) for cohorts born before 1970, but has grown markedly since then, reaching nine percentage

[6] For more details on the recent sex-based gaps in college outcomes, see Goldin, Katz, and Kuziemko (2006).

[7] Although we can track black-white differences in educational attainment for the entire period under analysis, for Hispanics we can provide reliable statistics only as of 1980, when the census began to explicitly ask about "Hispanic origin" on the enumeration form.

points for cohorts born in the early 1980s. This pattern reflects the extraordinarily low college graduation rate for African- American men – only 11 percent for cohorts born in the early 1980s.

The female advantage in college completion is a more recent phenomenon for white Americans than for black Americans. Among cohorts born in the first half of the twentieth century, the college graduation rate among white men was higher than that of white women. Only for cohorts born after 1960 was the pattern reversed.[8] The Census data allow us to identify Hispanics as of 1980, so we are able to show completion trends for this group as of the 1955 birth cohort. We find that the female advantage in college completion has grown markedly in recent decades for Hispanic Americans. Among Hispanics born in the early 1980s, the college completion rate of women (17 percent) is six percentage points higher than that of men. The female advantage has grown most sharply among non-Hispanic whites, however with the gap reaching more than ten percentage points for cohorts born in the early 1980s. The trend in the female advantage for Hispanic Americans is similar in recent decades to that for non-Hispanic white Americans, although the rate of increase in the female advantage is more modest.

III. Some Potential Explanations for Increased Educational Inequality

In this section, we discuss some possible explanations for the rise in educational inequality that we have documented in previous pages.

[8] The reversal would have taken place a decade earlier if the Vietnam War had not resulted in a temporary jump in the college entry rate for males.

Inequality in High School Graduation

If students do not complete high school, they are unlikely to enter college and have little chance of earning a B.A.[9] In this sense, differences across groups in high school completion rates may "explain" some of the gaps we observe in college entry and completion. We do not mean "explain" in a causal sense. The same social and economic forces that drive the decisions to complete high school may well affect decisions to enter college. That is, unobserved factors may drive both educational outcomes. In the short term, however, the stock of high school dropouts acts as a constraint on the ability of policy to increase college entry and completion: a policy to improve remedial education in college or expand financial aid will almost certainly have a near-zero effect on the schooling of a high school dropout. In the long term, by contrast, it is plausible that a more generous financial aid policy would increase high school graduation (for example, by increasing the option value of a high school degree). In this section, we calculate how much of the inequality in college entry can be "explained" by inequality in high school completion.

Inequality across income groups in high school completion was relatively stable between the two NLSY cohorts (results not shown). High school graduation rose for all income groups.. The share graduating high school rose by eight percentage points in the lowest-income quartile (from 55 to 63 percent) and by ten percentage points in the next income quartile (from 71 to 81 percent). The gap in high school graduation rates between the top and bottom quartiles shrank very slightly, from thirty-four to thirty-three percentage points. This would tend to slightly reduce inequality in college entry and completion.

[9] In the NLSY, about 5 percent of those with no high school degree show some postsecondary experience, and near zero have a B.A. It is possible to attend community college and many certificate programs without a high school degree, and this may explain the 5 percent figure.

Offsetting this is that the share of high school graduates going on to college rose dramatically, so the "penalty" for dropping out of high school also rose dramatically. Consider traditional high school graduates (who earn a standard diploma rather than a GED). In the early cohort, 52 percent of traditional high school graduates went to college, while in the later cohort the figure was 70 percent. The gap in traditional high school completion between the bottom and top quartiles was forty percentage points for the early cohort and thirty-seven percentage points for the later cohort. For the early cohort, the gap in high school graduation, therefore, "explains" 20.3 (= 0.39 × 0.52) percentage points of the gap of thirty-six percentage points in college entry. For the later cohort, the high school graduation gap explains 25.9 (= 0.37 × 0.70) percentage points of the gap of fifty-one percentage points in college entry. Differences in high school graduation therefore go a long way toward explaining differences in college entry.

Further, the "quality" of high school degrees in the bottom-income quartile is lower than that in the top. Students can complete high school in two ways: by earning a traditional diploma or by passing a test that earns them the General Educational Development credential (GED). For both cohorts, 7 percent of those in the bottom-income quartile have only a GED, compared with 2 to 3 percent in the top. Those who complete high school with a GED are less likely to go on to college than those with a traditional diploma (Cameron and Heckman 1993), and virtually no one in these data sets with a GED completes college. However, the income gap in GED receipt did not increase between the two NLSY cohorts. The GED could, therefore, explain rising inequality in college entry and completion only if the "penalty" associated with GED receipt grew worse over time—which it did. In the earlier NLSY cohort, 22 percent of GED holders went on to college, compared to 51 percent of those with a traditional high school diploma. But for the later

cohort, the share of GED holders going to college dropped by nearly half (to 12 percent) while the share of traditional high school graduates entering college rose to 70 percent.

How much can inequality in GED receipt explain rising inequality in college entry and completion? A back-of-the-envelope calculation suggests "not much." For the early cohort, GED recipients are thirty percentage points less likely than traditional high school graduates to enter college (22 versus 52 percent). For the later cohort, the difference is fifty-eight percentage points (12 versus 70 percent). We can multiply the difference between quartiles in GED receipt by the GED "penalty" to get an estimate of how much of the gap in college entry is explained by differences in GED receipt. For the NLSY79 cohort, the GED explains 1.4 (= .047 × .30) percentage points of the thirty-nine–percentage-point difference in college entry between the top and bottom quartile. For the NLSY97 cohort, the GED explains 2.4 (= .042 × .58) points of the fifty-one-percentage-point difference. Mechanically, then, the GED does not appear to explain much of the rise in or level of inequality in college entry.

Inequality in Cognitive Skills

In the same sense that differences in high school graduation can "explain" gaps in college entry and completion, gaps in cognitive skills could also have explanatory power. To examine this question we regress a binary indicator for the outcomes of interest (college entry or college completion) on income dummies, and examine how our estimated income gaps change when we add a measure of cognitive skills to the regression. In the NLSY, our measure of cognitive skills for both cohorts is the Armed Forces Qualification Test (AFQT). To control for AFQT, we add a set of AFQT quartile dummies to the regressions. We run regressions for men and women.

We offer the same caveats as earlier: this is not a causal analysis. Evidence indicates that the AFQT is malleable (Cascio and Lewis 2006), and it is likely to be affected by many of the

conditions that have a direct effect on college entry and completion. AFQT gaps can potentially be addressed with early childhood interventions or improved elementary schools. But a young person who arrives at college age with very low cognitive scores is unlikely, for example, to be induced by financial aid into college, so the skills acquired as of that age act as a constraint on the effectiveness of college-access policies.

For the early cohort, the gap in college entry between the bottom- and top-income quartile drops from thirty-nine to fourteen percentage points once we control for AFQT, while the gap in college completion drops from thirty-one to fourteen percentage points.[10] For the later cohort, the gap in college entry between the bottom- and top-income quartile drops from fifty-one to twenty-six percentage points once we control for AFQT, while the gap in college completion drops from forty-five to twenty-two percentage points. These regressions indicate that differences in cognitive ability explain a smaller share of the income gap for the later cohort than for the early cohort. Belley and Lochner (2007) reach a similar conclusion in their analysis of AFQT, income, and postsecondary attainment. In short, inequality by family income in postsecondary attainment has grown in recent decades. Even among those who had the same measured cognitive skills as teenagers, inequality in college entry and completion across income groups is greater today than it was two decades ago. These finds are consistent with two themes in this volume.

Explaining Growing Sex Differences in Inequality

Increasing college costs, disintegrating families, and decreasing school quality have been proposed as factors contributing to the increase in inequality in college outcomes between

[10] These specifications include the black and Hispanic dummies, so the stated income gaps do not correspond to those in the graphs. Pedro Carneiro and James J. Heckman (2002) and David Ellwood and Thomas J. Kane (2000) explore the relationship between AFQT, income, and college attainment.

children from low-income families and those from high-income families. Yet all of these social concerns affect both girls and boys. Over the sixty-seven years we have documented, sex differences in educational attainment and inequality have reversed sign. Women are more likely enter and complete college today than men are, and inequality in educational attainment is greater among women than men. The reverse was true earlier in the twentieth century: women were less likely to enter and complete college. These findings are consistent with two main explanations: (1) Men and women may respond differently to the same family or school circumstances. (2) Differences in circumstances across women and men of the same family income and race have shaped inequality in educational attainment for some time. The social science literature provides evidence that both explanations may be at work.

Gender asymmetry in primary and secondary education and in single-parent families provides two important potential explanations of why men and women respond differently to the same family or school circumstances. The first explanation relates to the fact that the bulk of primary and secondary schoolteachers are women. Through both "passive" (teachers provide role models to demographically similar students, or the gender or race of teachers prompts different responses from students) and "active" teacher effects (teachers' unintended biases affect their interactions and assessments of students), boys and girls may experience and respond to the same classroom setting quite differently. The literature examining these effects has tended to focus on being assigned to a teacher of a similar race on the performance of students (Griffin and London 1979; Beady and Hansell 1981; Ferguson 1998; Ehrenberg, Goldhaber, and Brewer 1995), but Thomas S. Dee (2005) shows that both racial and gender effects are important. Using the National Educational Longitudinal Survey (1988), Dee (2005) uses a teacher fixed-effects

model to shows that both other race and other sex teachers are significantly more likely to rate students as disruptive and inattentive.

A second potential explanation relates to the fact that the bulk of single-parent households are headed by women and that more children in single-parent families live with their mothers. The absence of a male role model may have a differential effect on boys (see Hetherington, Bridges, and Insabella 1998 for a review of this literature). Consistent with this claim, Jacob (2002) shows that college attendance was significantly lower among boys (but not girls) in single-parent households after conditioning on a rich set of covariates. Buchmann and DiPrete (2006) also provide supportive evidence using the Current Population Study: for birth cohorts born since 1965, sons attain less education than their sisters when the father is absent.

Complementing these forces is that the returns to higher education may have created different incentives for boys and girls to continue their education. These different incentives may arise through marriage markets (Goldin 1992; Mare 1991; Oppenheimer 1988; Lewis and Oppenheimer 2000; Schwartz and Mare 2005), labor markets (Murphy and Welch 1989; Charles and Luoh 2003), and the interaction of both with norms about household work (Chiappori, Iyigun, and Weiss 2009).

Using the sum of spouses' earnings, Goldin (1997) estimates that the return to college rose from roughly 5 to 10 percent between cohorts born before World War I (from 1900 to 1919) to those born after World War II (from 1946 to 1965). Although the earnings-only mean returns show no consistent indication of being higher for women than men from 1963 to 2000, DiPrete and Buchmann (2006) show that the returns to college over this period rose faster for women than men when using measures that include returns through spousal income (via marriage-market

educational homagamy and marriage stability) as family size.[11] These trends are reinforced by the fact that marriage rates have fallen sharply among the less-educated during the last thirty years (Qian and Preston 1993; Watson and McLanahan 2009) as the fraction of women heading single-parent households has risen (Bianchi 1999; Ellwood and Jencks 2004; McLanahan 2004). Among those marrying, the propensities of the more educated to divorce relative to the less educated has also fallen since 1980. Although it is too early to draw strong conclusions from these associations, this evidence is consistent with higher and more rapidly increasing marriage market returns to college for women.

On the labor-market side, the returns to college rose quickly for both men and women. Several studies suggest that the returns to college have increased faster for women (Murphy and Welch 1992), especially among African-American women relative to African-American men (Kane 1994). This may be due in part to the greater returns to a high school education among men, as skilled-blue collar professions have remained less feminized (England and Farkas 1986; Reskin and Roose 1990). This is also consistent with descriptive evidence in Jacob (2002) that boys in the NELS are more likely to explain that they will not need more education for their jobs as a reason for not attending college. In addition, Charles and Luoh (2003) point out that own earnings variability rose more quickly with schooling for men than women, which implies that education may be a less volatile investment for women. Finally, Chiappori, Iyigun, and Weiss (2009) present a theoretical model that shows how rising labor-market returns to schooling,

[11] They use both a standard of living and insurance against deprivation measure. Standard of living is measured as the natural log of the sum of own and family income divided by the square root of family size. Insurance against deprivation is measured as being roughly at a middle-class standard of living: family income in pre-tax dollars of at least $16,000 for one person, $23,000 two people, $28,000 for family of three, and $32,000 for a family of four

falling time required in home production, and changing norms about the division of labor in the household may interact to produce greater returns to education for women.

IV. Conclusion

Our analysis shows substantial increases in college entry and college completion across income groups and across men and women. These increases reflect long-term improvements in college preparedness and increased access to postsecondary institutions. More and better high schools coupled with increasing returns to graduating led to a doubling of high school graduates from 1940 to 2007: 43 percent for the cohort of 1921 completed twelve years, compared to 89 percent of the cohort of 1988.[12] This opened the door to college for more youths.

Several lessons for researchers and policy makers emerge from our analysis. First, we have shown that inequality in high school graduation explains roughly half of income inequality in college entry. The fact that inequality in college entry can be "explained" by inequality in high school graduation has a very practical implication. Interventions that operate mainly on the college-entry margin—such as scholarships, college outreach campaigns, and mentoring—can only alter the college-entry decisions of those who are able to respond. Those who have already dropped out of high school, in body or spirit, cannot benefit from these interventions.

Second, we have shown that inequality in college persistence explains a substantial share of inequality in college completion. These differences in persistence may be driven by financial, academic, and social factors. Identifying these factors and coming up with effective policy responses should be a major research focus given that it is clear that inducing more low-income youth into college will not, by itself, serve to close income gaps in educational attainment. It is

[12] GED recipients are counted as high school graduates in the figures reported in this paragraph.

troubling that persistence rates among men dropped by about ten percentage points in the bottom two income quartiles while rising by more than ten percentage points among women in those same quartiles. Even if rates of college entry were miraculously equalized across income groups, existing differences in persistence would still produce large gaps in college completion.

Third, inequality in educational attainment has risen more sharply among women than among men. This is driven by rapid increases among women from upper-income families, who have pulled away from other women, and all men, in their educational attainment. This suggests that we look to institutions and factors that differentially affect women and men, especially those in the upper-income quartiles, if we want to understand the sources of increased inequality in educational attainment. Unpromising candidates are rising tuition costs and changing family structures, since these do not differ across the sexes. More promising candidates include differential interactions of boys and girls in K–12 classrooms or with a female parent or different labor- and marriage-market returns to college for men and women.

But these explanations focus on the modern era, and our time series suggest that recent changes in college entry and completion are part of a long-term historical pattern—they are not a new phenomenon. The recent reversal of the gender gap in postsecondary education was foreshadowed seventy years ago by a female advantage in high school education. Women have been more likely than men to complete high school since at least the 1940s. According to the census, 25 percent more women than men completed high school for the birth cohort of 1921. For white women, the corresponding figure is 24 percent, but black women were 67 percent more likely than black men to graduate from high school. By the 1960s, the gender gap in high school completion had narrowed to six percent, where it has remained. The fact that women were more likely to complete high school in an era where divorce rates were very low, childbearing

rates were higher, and the labor-market prospects for women were poorer leads us to question the common current presumption that women's recent achievements reflect modern demographic developments. In addition, black women's lead of ten percentage points in college entry over black men in 1940 suggests that the recent gap between black women and men may not reflect current policies or conditions but is the legacy of something much older.

Data Appendix

Census and ACS: Sample

We use the U.S. decennial censuses from 1940 to 2000 and the American Community Surveys (ACS) for 2006 and 2007 (Ruggles et al. 2009). Our census sample includes residents of "group quarters" such as dormitories, barracks, and prisons. We include only native-born U.S. residents, so that we can clearly distinguish the effect of social and economic conditions in the United States from shifts in immigration. We use the census weights in our calculations.

Census and ACS: Variable Definitions

From 1940 to 1980, the census obtained information about the highest grade of school a person had attended and completed, allowing us to identify those who have entered college, even if they completed no years of college. By contrast, the post-1980 censuses and the ACS record whether a person has "some college" or completed a degree. We define a college entrant as someone who at age nineteen has attended college or is enrolled in college (1940–80 censuses) or has "some college" or is enrolled in college (1990–2000 census and ACS). We define a college completer as someone who at age twenty-five has completed sixteen years of schooling (1940–80 censuses) or who has completed a BA or higher (1990–2000 census and ACS).

The coding of race has changed across census years. Until 1970, race coding depended upon an enumerator's visual inspection and recording of each person's race. From 1970 forward, race was reported by someone in the household. As the meaning of race has changed to include ethnicity, more recent censuses allow coding of mixed race. These changes are especially important as they relate to historical descriptions of outcomes among "Hispanic/Latinos," which is not considered a race by the Census Bureau. Beginning in 1980, the census explicitly asked about "Hispanic origin" on the enumeration form and did not recode "Hispanic/Latino" and "other race" responses as white. Nevertheless, even sophisticated attempts to impute changes in the "Hispanic origin" population before 1980 may miss many members of this group (Gratton and Gutmann 2000). There is no simple way to deal with this important data limitation. Our compromise is to present series for whites and blacks (which include Hispanics of those races) until 1970, and present separate series for non-Hispanic whites, non-Hispanic blacks, and Hispanics for the 1980–2000 census and the ACS.

NLSY: Sample

We focus on NLSY79 cohorts born 1961–64 and NLSY97 cohorts born 1979–82. We limit the sample to native-born respondents who responded to questions about their completed education at both age nineteen and twenty-five. We use the baseline survey weights to generate our means.

NLSY: Variable Definitions

A person is coded as a college entrant if they were enrolled in college at any survey between baseline and age nineteen. A person is coded as a college completer if they had completed a BA by age twenty-five.

References

Beady, Charles H. and Hansell, Stephen. 1981. "Teacher Race and Expectations for Student Achievement." *American Educational Research Journal* 18(2): 191–206.

Belley, Philippe, and Lance Lochner. 2007. "The Changing Role of Family Income and Ability in Determining Educational Achievement." *Journal of Human Capital* 1(1): 37–89.

Bianchi, Susan M. 1999. "Feminization and Juvenilization of Poverty: Trends, Relative Risks, Causes and Consequences." *Annual Review of Sociology* 25:307-33.

Buchmann, Claudia and Thomas A. DiPrete. 2006. "The Growing Female Advantage in Higher Education: The Role of Parental Resources and Academic Achievement?" *American Sociological Review* 71 (4): 515-541.

Cameron, Stephen V., and James J. Heckman. 1993. "The Nonequivalence of High School Equivalents." *Journal of Labor Economics* 11(1): 1–47.

Caneiro, Pedro, and James J. Heckman. 2002. "The Evidence on Credit Constraints in Post-Secondary Schooling." *Economic Journal* 112(482): 705–34.

Card, David, and Thomas Lemieux. 2001. "Going to College to Avoid the Draft: The Unintended Legacy of the Vietnam War." *American Economic Review* 91(2): 97–102.

Cascio, Elizabeth, and Ethan Lewis. 2006. "Schooling and the AFQT: Evidence from School Entry Laws." *Journal of Human Resources* 41(2): 294–318.

Charles, Kerwin Kofi, and Ming-Ching Luoh. 2003. "Gender Differences in Completed Schooling." *Review of Economics and Statistics* 85(3): 559–77.

Chiappori, Pierre-André, Murat Iyigun, and Yoram Weiss. 2009. "Investment in Schooling and the Marriage Market." *American Economic Review* 99(5): 1689–713.

Dee, Thomas. S. 2005. "A Teacher Like Me: Does Race, Ethnicity, or Gender Matter?" *American Economic Review*, 95(2): 158–165.

Ehrenberg, Ronald G.; Goldhaber, Dan D. and Brewer, Dominic J. 1995. “Do Teachers’ Race, Gender and Ethnicity Matter? Evidence from the National Educational Longitudinal Study of 1988.” *Industrial and Labor Relations Review*, 48(3): 547–61.

Ellwood, David T. and Christopher Jencks. 2004. “The Uneven Spread of Single-Parent Families: What Do We Know? Where Do We Look for Answers?” In K. Neckerman, ed. *Social Inequality*. (New York: Russell Sage Foundation).

Ellwood, David, and Thomas J. Kane. 2000. “Who Is Getting a College Education?” In Sheldon Danziger and Jane Waldfogel, eds., *Securing the Future: Investing in Children from Birth to College*, 283–323. (New York: Russell Sage).

England, Paula and George Farkas. 1986. *Households, Employment and Gender: A Social, Economic and Demographic View.* (New York: Aldine).

Ferguson, Ronald F. 1998. “Teachers’ Perceptions and Expectations and the Black–White Test Score Gap,” In C. Jencks and M. Phillips, eds., 217–317, *The Black–White Test Score Gap*. (Washington, DC: Brookings Institution Press).

Goldin, Claudia. 1992. “The Meaning of College in the Lives of American Women: The Past 100 Years.” National Bureau of Economic Research Working Paper.

Goldin, Claudia.1997. “Career and Family: College Women Look to the Past.” In F.D. Blau and R.G. Ehrenberg, eds., *Gender and Family Issues in the Workplace*. (New York: Russell Sage Foundation).

Goldin, Claudia, Lawrence Katz, and Ilyana Kuziemko. 2006. “The Homecoming of American College Women: The Reversal of the College Gender Gap.” *Journal of Economic Perspectives* 20(4): 133–56.

Gratton, Brian, and Myron Gutmann. 2000. “Hispanics in the United States, 1850–1990: Estimates of Population Size and National Origin.” *Historical Methods* 33(3): 137–53.

Griffin, Albert R. and London, Clement B. G. 1979. “Student Relations among Inner-City Teachers: A Comparative Study by Teacher Race.” *Education*, 101(2): 139–47.

Hetherington, E. Mavis, Margaret Bridges, and Glendessa M. Insabella. 1998. “What Matters? What Does Not? Five Perspectives on the Association between Marital Transitions and Children’s Adjustment.” *American Psychologist*, 53 (2): 167–184.

Jacob, Brian. 2002. “Where the Boys Aren’t: Non-Cognitive Skills, Returns to School and the Gender Gap in Higher Education.” *Economics of Education Review* 21(6): 589-598.

Kane, Thomas. 1994. “College entry by blacks since 1970: The role of college costs, family background and the returns to education.” *Journal of Political Economy* 102 (5): 878–911.

Lewis, Susan K. and Valerie K. Oppenheimer. 2000. “Educational Assortative Mating Across Marriage Markets: Non-Hispanic Whites in the United States.” *Demography* 37(1):29-40.

Mare, Robert D. 1991. “Five Decades of Educational Assortative Mating.” *American Sociological Review* 56(1):15-32.

McLanahan, Sara S. 2004. “Diverging Destinies: How Children Are Faring Under the Second Demographic Transition.” *Demography* 41(4):607-27.

Murphy, Kevin M. and Finis Welch. 1992. “The Structure of Wages.” *Quarterly Journal of Economics* 107: 215-236.

Oppenheimer, Valerie K. 1988. “A Theory of Marriage Timing.” *American Journal of Sociology* 94: 563-91.

Qian, Zhenchao and Sam H. Preston.1993. “Changes in American Marriage, 1972 to 1987: Availability and Forces of Attraction by Age and Education.” *American Sociological Review* 58: 482-95.

Reskin, B. and P. Roose. 1990. *Job Queues, Gender Queues: Explaining Women’s Inroads into Male Occupations*. (Philadelphia: Temple University Press).

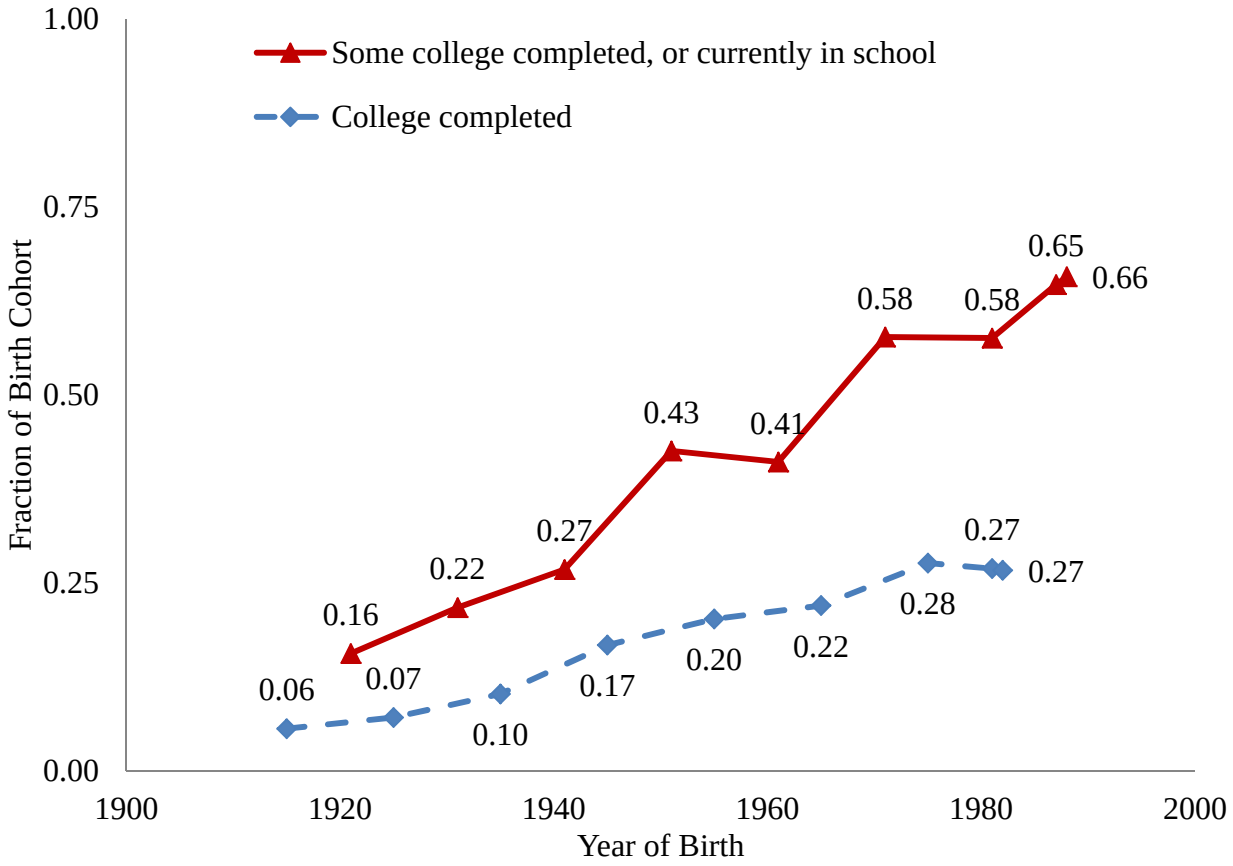
Ruggles, Steven, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander. 2009. *Integrated Public Use Microdata Series: Version 4.0* [Machine-readable database]. Minneapolis: Minnesota Population Center.

Schwartz, Christine R. and Robert D. Mare. 2005. “Trends in Educational Assortative Mating From 1940 to 2003.” *Demography* 42(4):621-46.

Turner, Sarah. 2004. “Going to College and Finishing College: Explaining Different Educational Outcomes.” In C. Hoxby, ed., *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It*. (Chicago: University of Chicago Press).

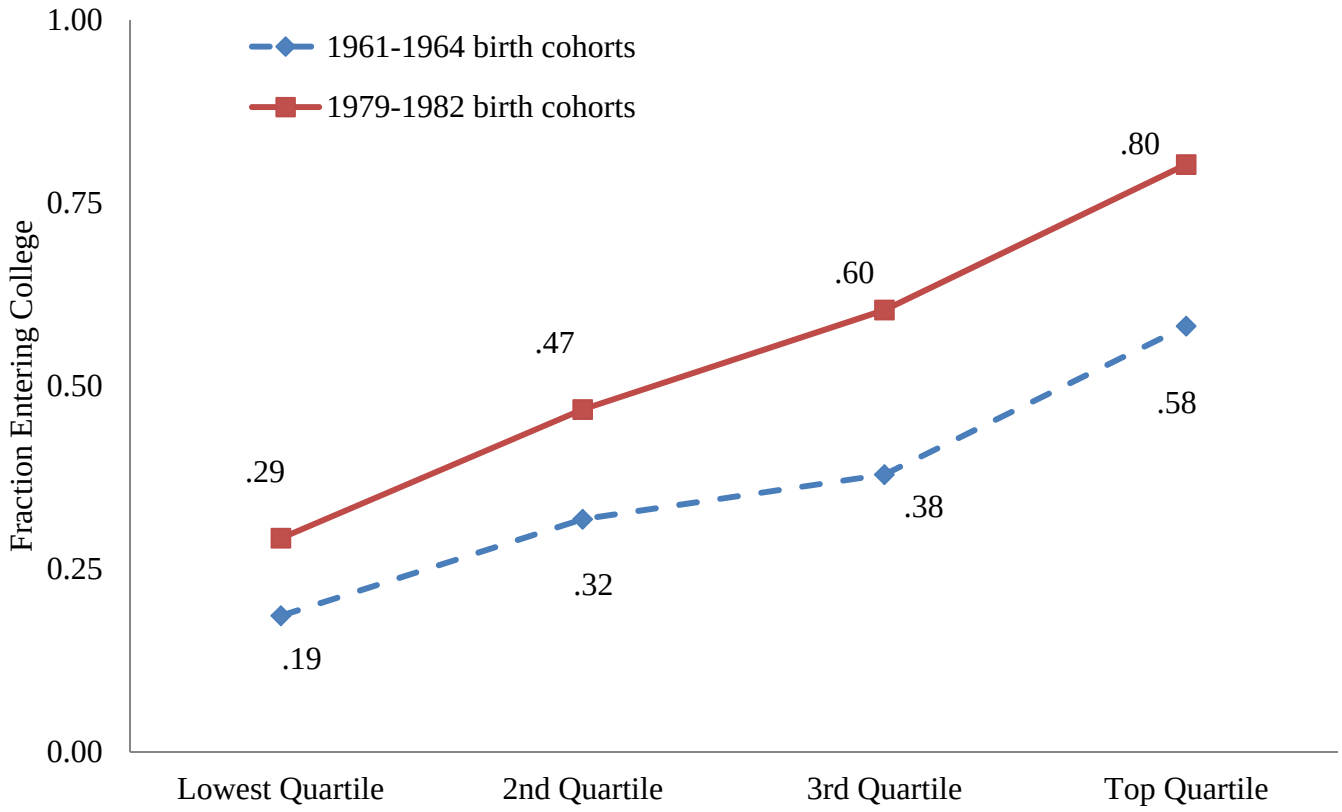
Watson, Tara, and Sara McLanahan. 2009. “Marriage Meets the Joneses: Relative Income, Identity, and Marital Status,” National Bureau of Economic Research Working Paper 14773, March.

Figure 1: Trends in College Entry and Completion



Source: Authors' calculations based on U.S. Census and American Community Survey (Ruggles et al. 2009).

Figure 2: Fraction of Students Entering College, by Income Quartile and Birth Year



Source: Author's calculation based on data from the National Longitudinal Survey of Youth, 1979 and 1997 (U.S. Bureau of Labor Statistics, 2010a, 2010b).

Figure 3: Fraction of Students Completing College, by Income Quartile and Year of Birth

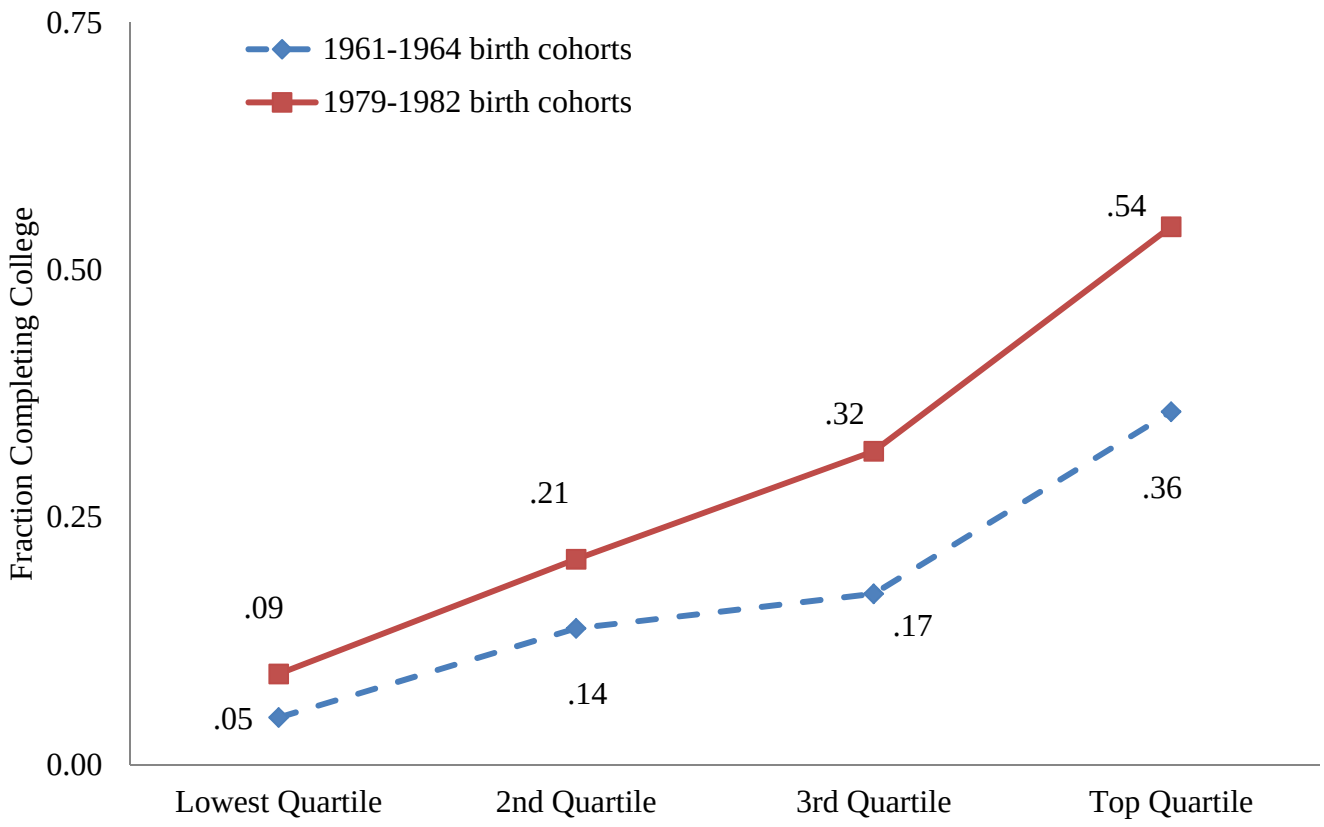


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Figure 4: Fraction of Students Persisting in College, by Income Quartile and Birth Year

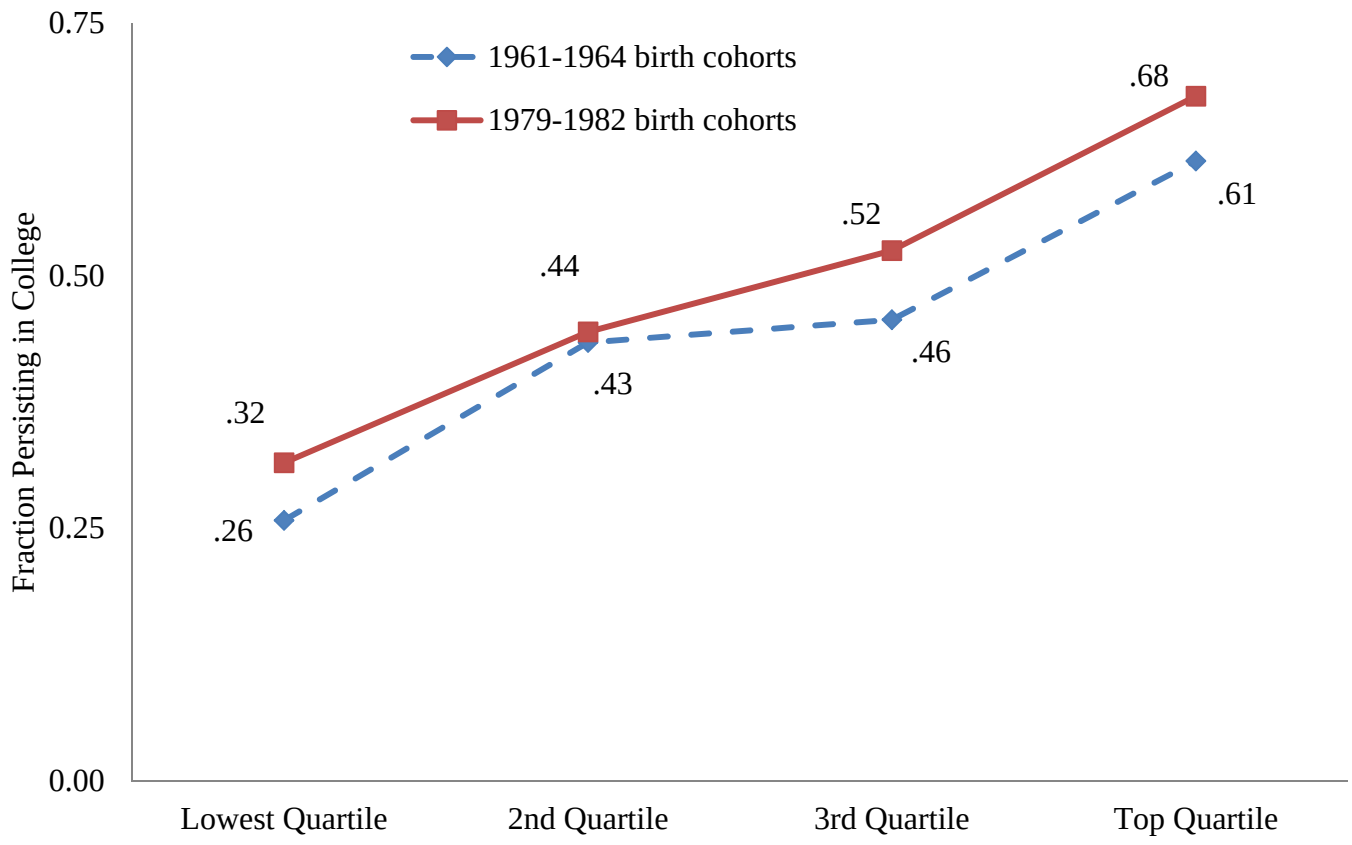

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Figure 5: Female Advantage in Completing College, by Income Quartile and Year of Birth

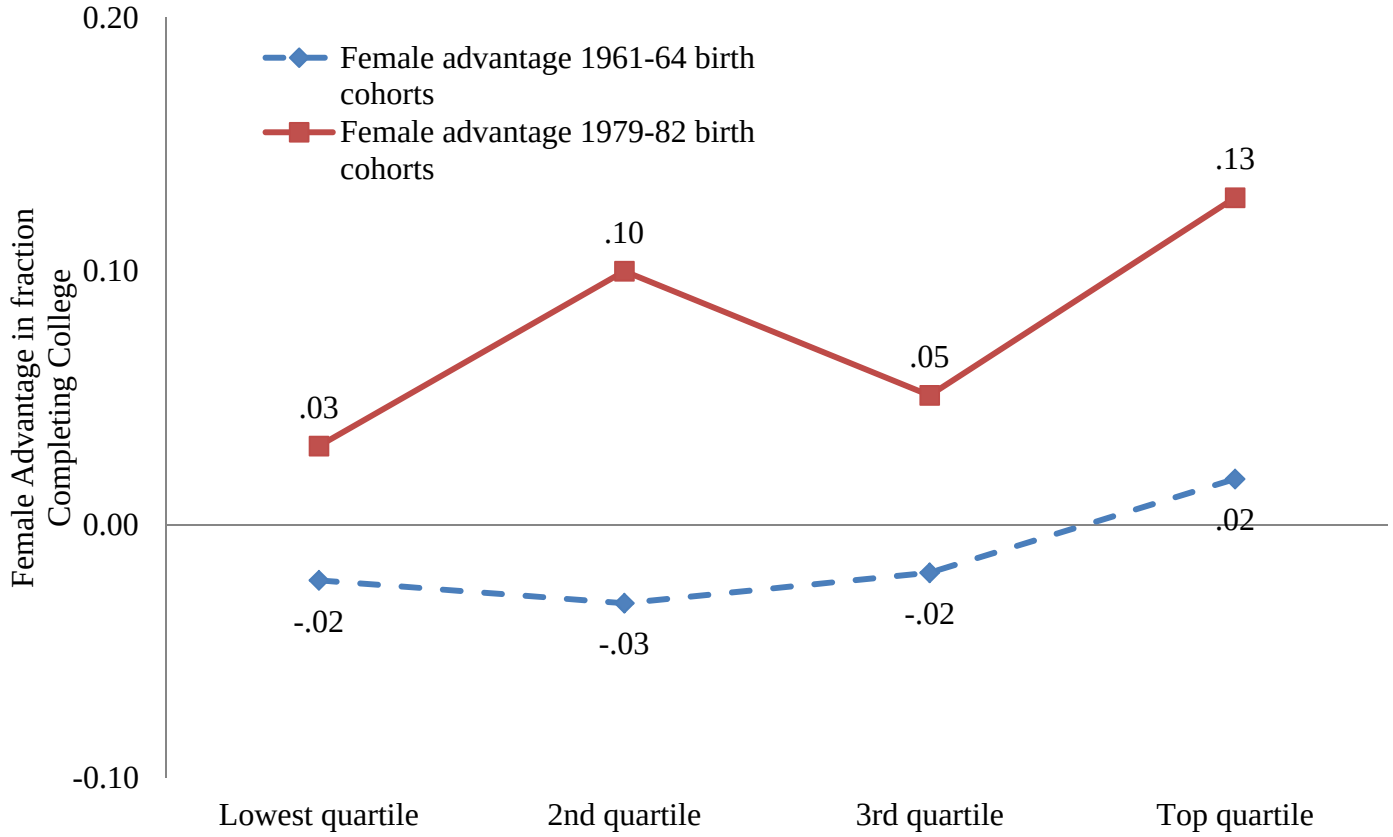

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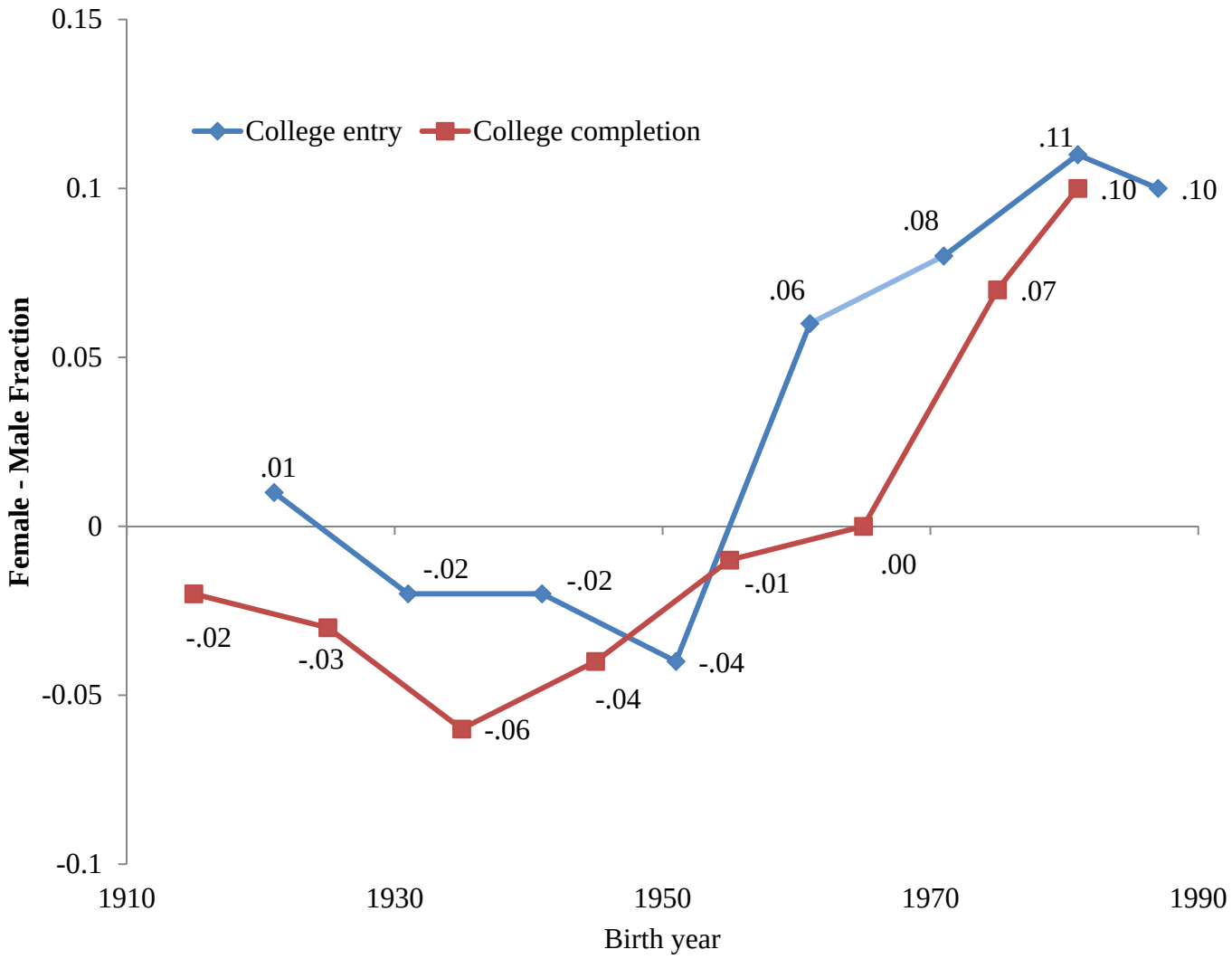
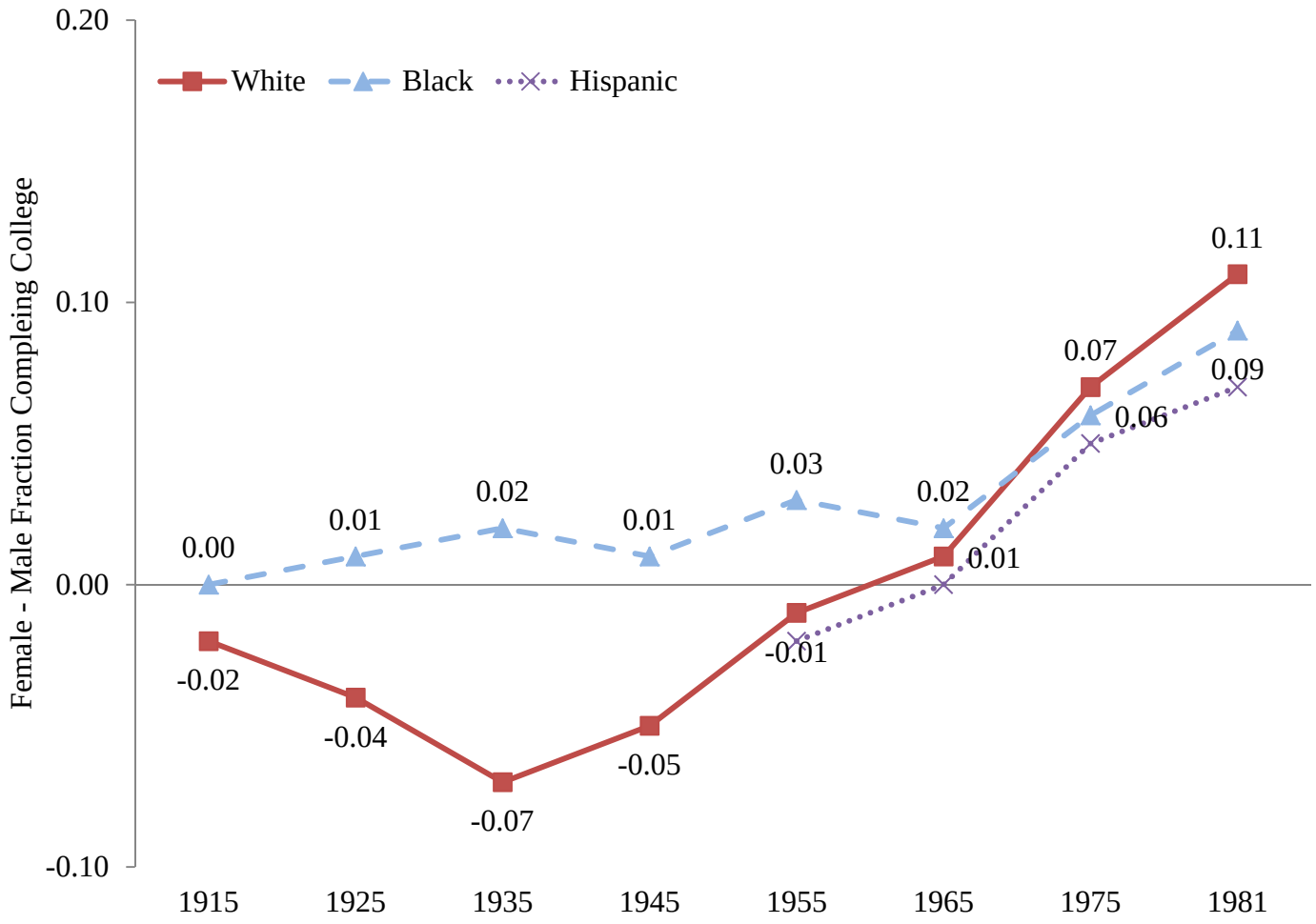
Figure 6: Female Advantage in College Entry and Completion, by Age



Source: Authors' calculations based on U.S. Census and American Community Survey (Ruggles et al. 2009).

Figure 7: Female Advantage in Completing College, by Race and Birth Year



Source: Authors' calculations based on U.S. Census and American Community Survey (Ruggles et al. 2009).