Bachelors Without Bachelor's: Gender Gaps in Education and Declining Marriage Rates*

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January 2025
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Abstract

Over the past half-century, the share of men enrolled in college has steadily declined relative to women. Today, 1.6 million more women than men attend four-year colleges in the U.S. This trend has not lowered marriage rates for college women, a substantial share of whom have historically married economically stable men without college degrees. Both historical evidence and cross-area comparisons suggest that worsening male outcomes primarily undermine the marriage prospects of non-college women. The gap in marriage rates between college- and non-college women is more than 50% smaller in areas where men have the lowest rates of joblessness and incarceration.

*We thank Raj Chetty, John Eric Humphries, John Friedman, Claudia Goldin, Elisa Jácome, Melissa Kearney, Kelly Musick, Richard Reeves, Hannes Schwandt, Jonathan Tebes, Alanna Williams, and Riley Wilson for helpful comments and discussions. This research was funded by the American Institute for Boys and Men and Cornell University.

I Introduction

Marriage rates have declined significantly in recent decades, particularly among Americans without college degrees (Kearney, 2023; Lundberg, Pollak and Stearns, 2016). This trend has significant implications for economic inequality between those with and without higher education, as well as for broader patterns of intergenerational mobility (Bailey and Lin, 2022; Chadwick and Solon, 2002; Mare, 1991; McLanahan, Tach and Schneider, 2013). Children born to mothers without college degrees are increasingly likely to grow up in single-parent households (Kearney, 2022; Manning, Brown and Stykes, 2015).

An emerging narrative in academia and the popular press suggests that similar declines in marriage rates may soon appear among college-educated women, driven by a perceived shortage of "marriageable men" (e.g., Bernstein, 2024; Cox, 2023*b*; Hill, 2024; Inhorn, 2023; Saner, 2015). Growing gender gaps in higher education are frequently cited as a key factor behind this trend, with the argument that it has become increasingly difficult for women to find equally educated partners (Birger, 2015; Louie Sussman, 2023). These gaps, now larger than in 1972—the year Title IX was enacted—have reversed direction, with women now significantly more likely than men to attend a four-year college. Compounding these challenges, men and boys—particularly those from lower-income backgrounds—are experiencing a range of adverse outcomes, including higher rates of substance use, job instability, and poor mental health (Case and Deaton, 2017; Reeves, 2024*b*).

In this paper, we show that historical trends over the past half-century and cross-area comparisons from recent cohorts do not support the prediction that growing gender gaps in education will reduce marriage rates for college-educated women. Instead, the data suggest that worsening male outcomes primarily diminish the marriage prospects of non-college women. Our analysis proceeds in two steps. First, we show that marriage rates for college-educated women have remained stable over the past fifty years, even as the relative supply of college-educated men has steadily declined. The overall decline in marriage rates is driven almost entirely by a sharp drop in marriages between non-college women and non-college men, who have experienced significant declines in economic and social outcomes over this period. Second, we show that data from recent cohorts across different regions of the U.S. align closely with these historical patterns. In particular, the education gap in marriage rates for women is substantially larger in areas where non-college men face the highest rates of joblessness and incarceration.

Our analysis draws on data from the Current Population Survey (CPS), the American Community Survey (ACS), and linked Census and tax records from the Opportunity Atlas (Chetty et al., 2018). We use household survey data to examine historical trends in marriage patterns and use linked Census and tax data to explore current geographic variation in marriage. Our primary focus is on marriage among individuals aged 40-49, which we refer to as marriage at age 45. We

categorize the sample into four groups: college women (women with at least a four-year degree), non-college women (all other women), college men, and non-college men. In the Appendix, we provide additional details on sample construction and variable definitions. We also present a subset of our results using more granular definitions of educational attainment, and show that our results remain robust when using alternative outcomes, such as marriage at different ages, ever being married, or including cohabitation in the definition of marriage.

College men have indeed become relatively scarce. Among Americans born in 1930, there were nearly two college men for every college woman. Although college attendance rates have risen for both men and women, the increase has been notably sharper for women. By the 1980 cohort, there were fewer than one college men for every college woman. If college-educated Americans are intent on marrying partners who also hold college degrees, this trend would inevitably reduce marriage rates among college women.

Yet, over this same period, marriage rates at age 45 have declined by only 6.7 percentage points (pp) for college women—even in the 1980 cohort, more than 70% are married at age 45. In contrast, the decline in marriage rates for non-college women has been nearly four times larger. By the 1980 cohort, only about one in two non-college women were married at age 45. The decline in marriage rates in the U.S. is largely driven by Americans without four-year degrees. In the spirit of Novosad, Rafkin and Asher (2022), we show that these divergent trends in marriage by college attainment primarily reflects reduced marriage among the least educated Americans, rather than shifts in the socioeconomic status of college attendees.

Rising gender gaps in education have not significantly lowered marriage rates for college-educated women, as many of these women are—and have historically been—married to non-college men. While there is substantial assortative mating by education, nearly one in four college women marry non-college men—a share that remained stable between the 1930 and 1980 cohorts. Across these cohorts, roughly half of college women either marry non-college men or remain unmarried, implying that the share of college women married to college men can remain stable as long as the ratio of college men to college women stays above 0.5. Although this ratio has declined over time, it has remained comfortably above 0.5. In the 1980 cohort, there were 0.79 college men per college woman, and data from more recent cohorts suggest this ratio has declined only slightly, to approximately 0.75 (Reeves, 2024*a*). Consistent with the absence of binding constraints on the marriage decisions of college-educated women, we show—using early adulthood relationship data—that educational disparities in marriage rates are likely to widen in the coming years.

To formally quantify these changes, we fit a parsimonious version of the Choo and Siow (2006) model to the time-series data. The model includes four "types"—college women, non-college women, college men, and non-college men—each with preferences over the type of partner they would like to marry. The exogenous variables in the model are the population counts for each

group. We estimate preferences using marriage outcomes from the 1930 cohort and then use the model to predict how marriage rates would evolve in subsequent decades, given the observed changes in the number of men and women attending college, while holding 1930 preferences fixed. Conceptually, this is equivalent to a decomposition that estimates what fraction of the change in marriage rates is driven by changing education rates by gender versus changing preferences.

The model predictions support the logic that gender gaps in college attendance rates have not widened enough to reduce marriage rates for college women. The predicted share of college women married to college men remains stable over time, closely aligning with actual trends. However, the model indicates that changes in education rates by gender cannot account for the sharp decline in marriage rates among non-college women, which is driven entirely by decreasing rates of marriage to non-college men. Within the framework of the model, this suggests that the drop in marriage rates for non-college women stems from changing preferences for marriages between non-college men and women rather than from shifts in education rates by gender. This raises the question: what has happened to the non-college men whom non-college women married at high rates in earlier cohorts?

Economic outcomes, such as earnings and labor force participation, have declined for non-college men in recent decades (Binder and Bound, 2019; Reeves, 2022). We show that this decline is particularly pronounced among the non-college men who form the primary pool of potential partners for non-college women. Specifically, when we exclude non-college men who are married to college women from the sample, the remaining non-college men experience a dramatic drop in earnings. For this group, average real earnings at age 45 have fallen by nearly 25%—a striking contrast to the more than doubling of average real earnings in the broader economy over the same period. Notably, this decline is limited to non-college men who are not married to college women; for those who are, real earnings have modestly increased over this period. Additionally, real earnings for non-college women have risen as more women have entered the labor force, potentially altering the dynamics of marriages between non-college men and women (Bailey and DiPrete, 2016; Goldin and Katz, 2002; Shenhav, 2021).

These trends suggest that the burden of declining education and economic outcomes for men has been borne predominantly by non-college women rather than college women. To further explore the connection between non-college men's economic outcomes and marriage rates for non-college women, we analyze data from recent cohorts using cross-area variation in non-college men's employment rates.

We find that gaps in marriage rates between college and non-college women are 50% smaller in commuting zones where men have the lowest incidence of "left-tail" outcomes, such as joblessness and incarceration. Consistent with the historical trends, this gap is driven almost entirely by low marriage rates for non-college women in communities where men face poor outcomes. The

association between marriage rates for non-college women and left-tail outcomes for men is highly robust: it holds for all racial groups, within states across commuting zones, and when conditioning on college attendance rates for women. By contrast, marriage rates for college women are far less sensitive to local non-college men's outcomes—perhaps because men facing these adverse outcomes were never a substantial part of their marriage market. Fertility rates for non-college women show a weaker association with men's outcomes—in areas where men fare worse, non-college women continue to have children, often outside of marriage (Currie and Schwandt, 2014). This dynamic has potential implications for inequality in childhood resources and opportunities for the next generation (Kearney, 2022).

These area-level differences in marriage rates and men's outcomes provide valuable insights into the broader debate about the "marriageable men" hypothesis, or the extent to which declining outcomes for men have contributed to declining marriage rates (Edin and Kefalas, 2011; Kearney, 2023; Wilson, 1987). Recent studies have examined the causal effects of men's income and employment, as well as the relative earnings of women (e.g., Anelli, Giuntella and Stella, 2024; Autor, Dorn and Hanson, 2019; Kearney and Wilson, 2018; Shenhav, 2021). The evidence is mixed: improved labor market prospects for men appear to increase marriage rates in some contexts but not in others.

Taking a broader view of the challenges facing men and boys in communities with poor outcomes may provide greater clarity on the interplay between outcomes for non-college men and marriage rates. For instance, there is evidence that higher incarceration rates reduce marriage rates for women (Charles and Luoh, 2010; Jácome, 2017; Zaremba, 2022). In communities with high incarceration rates, marginal increases in men's earnings might not be sufficient to boost marriage rates. It is also possible that college attendance itself plays a causal role in equipping men with the non-cognitive skills needed to navigate the non-routine demands of a modern marriage (Ananat, 2024); without these skills, increases in earnings alone may not suffice. The strong association between marriage outcomes for non-college women and left-tail outcomes for men underscores the importance of understanding conditions in communities where men face adverse outcomes. Doing so may be key to explaining the widening education gaps in marriage rates and identifying effective strategies to improve outcomes for non-college men, thereby strengthening the pool of potential partners for non-college women.

Our paper makes three key contributions to the literature. First, we bring together trends in gender gaps in education and marriage—often studied in isolation—and formally decompose marriage trends into two components: the portion explained by growing gender gaps in college attainment and the portion driven by changing preferences for spousal education. Second, we find that the decline in marriage is almost entirely concentrated among non-college individuals and coincides with significant economic deterioration for non-college men, particularly those who do

not marry college women. Third, we demonstrate that educational disparities in marriage rates are most pronounced in areas where non-college men experience high rates of joblessness and incarceration. Notably, fertility among non-college women is less sensitive than marriage to the economic outcomes of non-college men, implying higher rates of out-of-wedlock births in areas where non-college men face adverse conditions.

II A Half-Century of College and Marriage

Over the past 50 years, U.S. college campuses have shifted from being majority-male to majority-female. While college attainment has risen for both men and women during this period, the faster growth in women's attainment has significantly altered gender imbalances in higher education. Figure A.1*A* shows that between the 1930 and 1980 birth cohorts, the share of men completing at least four years of college rose from 18% to 40%, while the share of women increased from 10% to 46%. Figure I*A* shows that these differing growth rates caused the ratio of college men to women to decline from just under 2 to 0.8 during the same period.

Theory and evidence on assortative matching suggest that these trends could have significant implications for opposite-sex marriages (Becker, 1973; Blossfeld, 2009; Chiappori, Iyigun and Weiss, 2009; Eika, Mogstad and Zafar, 2019; Mare, 1991).[1] If college women strongly prefer to marry college men, the increasing relative scarcity of such men may make it more challenging for them to find a suitable partner. Some speculate—often based on anecdotal evidence—that these shifts may already be influencing the dating prospects of young college women today (e.g., Saner, 2015; Cox, 2023*a*).

Trends in marriage rates over the past half-century do not support the idea that growing gender gaps in college attendance will depress marriage rates among college women. Figure I*B* shows that marriage rates for college women have declined only modestly, even as college men have become increasingly scarce in relative terms. Among college women born in 1930, 77.7% were married at age 45. Fifty years later, 71.0% of college women born in 1980 were married at age 45.

In contrast, marriage rates for non-college women have been consistently declining. Among women born in 1930, there was no education gap in marriage rates: 78.7% of non-college women were married at 45. By the 1980 cohort, only 52.4% of non-college women were married at age 45. This is the key trend underlying the growing education polarization of marriage in the U.S. (Kearney, 2023; Lundberg, Pollak and Stearns, 2016; McLanahan, 2004; Musick and Michelmore, 2018).

[1]This reasoning does not apply to same-sex pairings. However, focusing on opposite-sex pairings, which constitute an estimated 99% of current marriages, offers a reasonable framework for analyzing marriage trends among the majority of Americans (Kreider et al., 2023; Black et al., 2007; Fisher, Gee and Looney, 2018).

The trends in Figure I*B* are robust to alternative definitions of marriage. Consistent with prior literature (e.g., Kearney, 2023), we find that the same pattern—steady marriage rates for college women and declining rates for non-college women—persists when examining marriage at earlier ages (Figure A.1*B*), considering ever-married rates to account for differences in divorce rates (Figure A.1*C*), or including cohabiting partners in the definition of marriage (Figure A.1*D*). There are parallel patterns of widening education gaps in marriage among men (Figure A.1*E*). Importantly, while fertility has also declined for non-college women (Figure A.2*A*), the decline has not been as steep as that in marriage, resulting in a growing share of children born to non-college mothers being raised outside of married two-parent households (Bailey, Guldi and Hershbein, 2013; Bailey and DiPrete, 2016; Kearney, 2022).

We divide our sample based on attending four or more years of college, both due to the social significance of these groups and because this distinction aligns naturally with trends in marriage rates. Figure A.1*F* provides a detailed breakdown of marriage rate trends by educational attainment. Women with a four-year degree or more follow a distinct trajectory, characterized by stable marriage rates, whereas women who dropped out of high school, completed only high school, or attended some college without earning a four-year degree show a marked decline in marriage rates.

Interpreting differences in trends between college and non-college groups is complicated by the growing share of the college-educated population over time. If marginal college-goers are non-randomly selected based on their propensity to marry, observed changes in group marriage rates may partly reflect compositional changes. As a result, it is theoretically possible for educational gaps in marriage to widen even if marriage rates for an individual at a specific point in the education distribution, such as the median, remain unchanged (Novosad, Rafkin and Asher, 2022).

Figure A.3 shows that these compositional changes cannot explain the growing educational gaps in marriage. Among the 1930 cohort, there was no relationship between educational attainment and marriage rates. Consequently, the declining marriage rates for non-college groups cannot be attributed to this group increasingly comprising individuals from the left tail of the education distribution. Instead, the decline in marriage stems from a sharp drop in the likelihood of being married among the relatively least-educated Americans. Similarly, marriage to non-college men declined significantly in the bottom half of the education distribution, suggesting that the decrease in non-college women's likelihood of marrying non-college men is not merely the result of compositional changes in the pool of women attending college.

Decomposing Growing Education Gaps in Marriage

Not only has the overall marriage rate for college women remained stable over time, but so has the share married to college and non-college men. The solid lines in Figure II depict trends in

marriage rates for college and non-college women, categorized by the education level of their spouses. Across all cohorts, approximately 50–55% of college women married college men, while 20–25% married non-college men. In contrast, the overall decline in marriage rates for non-college women is entirely driven by a sharp decrease in their marriages to non-college men, which fell from 69% in the 1930 cohort to 43% in the 1980 cohort. Their marriage rates to college men have remained consistently low at around 9%.

The results in Figures I and II provide clear evidence of assortative matching. While one-in-five college women have a non-college spouse, college women are significantly more likely than non-college women to marry a college man, whereas non-college women are much more likely to marry a non-college man. This pattern raises a natural question: were the trends in marriage rates observed between 1930 and 1980 "predictable" in the sense that they reflect the sorting patterns of the 1930 cohort combined with subsequent trends in college attendance by gender?

We use a transferable utility matching model, based on Choo and Siow (2006), to predict the evolution of marriage outcomes while holding preferences constant at their 1930 levels. Individuals are categorized into "types"—college and non-college—and have preferences over spousal types, with the market clearing through equilibrium transfers that balance matching demand. We first estimate the 1930 birth cohort's preferences, both for marrying and for spousal types, and then calculate expected marriage outcomes in later decades by holding these preferences fixed while accounting for changes in the type distribution due to differential college attendance rates by gender. Under the assumptions of the model, this framework decomposes observed trends into two components: changes driven by shifting college attendance rates by gender, reflected in model-predicted outcomes, and changes resulting from shifts in the surplus value of specific marriage pairings, measured as the difference between predicted and actual outcomes. These surplus shifts arise from either changes in individual preferences within a group (e.g., those who would have attended college regardless of the era) or changes in group composition (e.g., broader access to college), both of which we group under "preferences." Additional details on the model's implementation are provided in Appendix B.

The hollow series in Figure II shows the model predictions for different types of marriages. Marriage rates for college women are predicted to decline by 17 percentage points. Based on the preferences of the 1930 cohort, the composition of the marriage market for college women has deteriorated. College men have become relatively less available, and the smaller pool of non-college men makes it more challenging to find a suitable match. The model predicts a significant decline in the likelihood of college women marrying college men, with only limited substitution into the less preferred—and numerically smaller—group of non-college men. By contrast, marriage rates for non-college women are predicted to increase by 7 percentage points. This reflects the growing relative abundance of non-college men, who were their primary marriage partners in 1930.

The most striking departure between recent marriage outcomes and predictions based on 1930 matches involves marriages with non-college men, signaling a shift in preferences for or by this group that could not have been anticipated from the 1930 cohort or changes in college attendance. Notably, college women continue to marry non-college men at surprisingly high rates despite the declining number of non-college men, suggesting a growing willingness among college women to marry non-college men rather than remain single. In contrast, the sharp decline in marriage rates between non-college women and non-college men marks a significant departure from prior cohorts, where non-college Americans traditionally married at high rates. These findings reframe the narrative around how male educational outcomes relate to marriage outcomes for women. Rather than college women increasingly remaining single due to a shortage of college men, the data highlight a more pressing issue: non-college women might face a shrinking pool of suitable marriage partners among non-college men.

This revised focus aligns with a growing literature on the declining economic prospects of non-college men (Binder and Bound, 2019). Figure III*A* replicates the well-documented finding that average real earnings for non-college men have steadily declined over the last 50 years. In our sample, the average real earnings of non-college men at age 45 fell from $\$56,400$ for the 1930 birth cohort to $\$50,000$ for the 1980 birth cohort.

While average earnings among non-college men have declined, a subset of this group has maintained stable economic outcomes, and college women disproportionately marry men from this more economically stable subset. Figure III*B* shows that earnings for non-college men who marry college women have actually increased over time, rising from $\$61,400$ for the 1930 cohort to $\$68,400$ for the 1980 cohort. In contrast, the average earnings for all other non-college men have declined even more steeply than the aggregate figures suggest, dropping from $\$56,400$ for the 1930 cohort to $\$46,100$ for the 1980 cohort. This sharp decline in economic outcomes may affect the marriageability of non-college men to non-college women, especially as the economic standing of non-college women has improved (Goldin and Katz, 2002; Shenhav, 2021).

III Declining Male Outcomes and Marriage for Non-College Women

Over the past half-century, growth in college attendance among women has far outpaced that of men. Despite these trends, marriage rates have remained largely stable for college women but have declined sharply for non-college women. This decline coincided with a significant downturn in economic outcomes for non-college men. To gain deeper insight into the relationship between the economic outcomes of non-college men and marriage rates among non-college women, we turn to data from recent cohorts and cross-area variation in men's economic outcomes.

Estimating the causal effect of changes in men's outcomes on marriage rates is challeng-

ing, partly because the impact on marriage depends on the specific factors driving the changes in men's outcomes. This context dependency likely contributes to the mixed findings in the literature (e.g., Autor, Dorn and Hanson, 2019; Kearney and Wilson, 2018). Our goal is not to generate a new estimate of this causal effect but to examine whether the challenges faced by non-college men—identifiable in recent data—and the associated depressed marriage rates among non-college women are evenly distributed across areas or concentrated in specific regions. If these challenges and outcomes are closely linked and geographically concentrated, targeted interventions—designed to improve outcomes for non-college men and the marriage prospects of non-college women—could be more effectively directed toward areas where these challenges are most acute.

We begin with ACS data from 2017–2021 and construct a sample analogous to the one used in Section II, limiting the data to individuals aged 40–49 at the time of the survey. We calculate the employment-to-population ratio (EPOP) for non-college men in each PUMA. Our sample includes 2,351 PUMAs, each with an average population of approximately 140,000. To focus on variation in men's outcomes, we first residualize the EPOP for non-college men on fixed effects for 50 quantiles of women's college attendance rates. This approach ensures that we are comparing areas with nearly identical college attendance rates for women but differing levels of male employment. While we find this comparison more intuitive, our results are robust to whether we condition on women's college attendance rates or not. There is substantial spatial variation in (residualized) EPOP for non-college men: the standard deviation (SD) across PUMAs is 7.6pp. In some communities, more than 40% of non-college men are not working, while in others, fewer than 5% of non-college men do not work.

Just as observed in the time-series data in Section II, Figure IV*A* shows that marriage rates for non-college women are highly sensitive to outcomes for non-college men. A 1 SD decline (7.6pp) in the EPOP for non-college men is associated with a 4.1pp (7.2%) decline in marriage rates for non-college women. Given the substantial variation in men's employment outcomes, this translates into large differences in marriage rates. In areas with the lowest employment rates for non-college men (bottom 2.5% of the PUMA distribution), the marriage rate for non-college women is 44.5%, compared to 66.0% in areas with the highest employment rates for non-college men (top 2.5%).

On the other hand, marriage rates for college women exhibit a much weaker, albeit still positive, relationship with outcomes for non-college men. A 1 SD decline (7.6pp) in the EPOP for non-college men is associated with a 2.5pp (3.5%) decline in marriage rates for college women. Education gaps in marriage vary significantly across PUMAs with different EPOP levels for non-college men, driven by the differing slopes for college women compared to non-college women. In areas with the lowest employment rates for non-college men, there is a 17.8pp gap in marriage rates between college- and non-college women. This gap decreases by 8.6pp (48.3%) in communities

with the highest employment rates for non-college men.

Unlike marriage, gaps in fertility between college and non-college women are not strongly associated with EPOP for non-college men. We define fertility as the share of women aged 25–44 with their own child at home.[2] For college women, fertility declines almost one-for-one with marriage rates as EPOP for non-college men decreases. In contrast, for non-college women, the association between fertility and EPOP for non-college men is approximately 60% weaker than the association with marriage. In areas where men are less likely to work, non-college women continue to have children, but often outside of marriage (Currie and Schwandt, 2014; Kearney, 2022).

One challenge in interpreting these results is that we measure location, marriage outcomes, and EPOP simultaneously for individuals aged 40–49. The observed variation across places could partly reflect the joint location decisions of existing couples. For instance, some couples, particularly those in marriages between non-college men and women, might choose to live in areas with better employment opportunities for non-college men, potentially motivated by the desire to maximize their joint income (e.g., Jayachandran et al., 2024).

To remove variation introduced by "ex-post" migration decisions, we use the Opportunity Atlas (OA) data from Chetty et al. (2018), based on administrative IRS and Census records, which maps adult outcomes back to the commuting zones where individuals grew up. This approach allows us to examine variation in the composition of the marriage market individuals were born into, rather than the areas they choose to live as adults—potentially after marriage (Goldman, Gracie and Porter, 2024). Importantly, most Americans, including those from high-income families, tend to remain in their childhood commuting zones as adults (Sprung-Keyser et al., 2022). This means that the composition of childhood commuting zones is a critical component of adult marriage markets, even without conditioning on endogenous adult residential choices.

A limitation of these data is that they do not disaggregate marriage rates by education. Instead, we use "class" and compare women born into high-income (75th percentile of parental income) versus low-income (25th percentile of parental income) families, alongside outcomes for men born into low-income families. While class and education differ in important ways, they are closely related: 51.1% of women from high-income families attend a four-year college, compared to 23.6% of women from low-income families.

In Figure IV*B*, we replicate the analysis from Figure IV*A*, substituting class for education and childhood commuting zone for adult PUMA. Using the OA data, we find similar results: a 1 SD decrease (4pp) in employment for men from low-income families is associated with a 5.3pp (14.8%) decline in marriage rates for women from low-income families. This strong relationship

[2]The broader age range for measuring fertility ensures that the results are not driven by the tendency of non-college women to have children at younger ages compared to college women.

is likely driven by the high degree of assortative mating by class, similar to education. Estimates using similar data imply that there would be 2–3 times more interclass couples if people selected spouses without regard to class (Goldman, Gracie and Porter, 2024).

Meanwhile, a 1 SD decline in employment for men from low-income families is associated with a more modest 2.1pp (3.6%) decline in marriage rates for women from high-income families. The combination of these effects results in a substantial narrowing of class gaps in marriage rates, which decline from 29.4pp to 11.9pp (59.5%) in communities with the lowest versus highest EPOP for men from low-income families. Simply put, the substantial decline in marriage rates among working-class women over the past half-century is largely concentrated in areas of the U.S. where employment rates for working-class men are particularly low.

These findings are not specific to the choice of outcome variable: class gaps in marriage are significantly larger in communities where men from low-income families struggle across a broad range of metrics. In Figure IV*C*, we illustrate the two slopes from Figure IV*B* using alternative measures of outcomes for men from low-income families, including incarceration, failure to complete high school, mortality, and average earnings percentile.[3] Across all these outcomes, women from low-income families are significantly more sensitive than women from high-income families to the conditions faced by men from low-income families.

These patterns appear to reflect the commuting zone-level relationship between class gaps in marriage for women and outcomes for men from low-income families, rather than broader regional differences in demographic composition or attitudes toward marriage. In Figure IV*C*, we demonstrate that women from low-income families are highly sensitive to the outcomes of men from low-income families within specific race and ethnicity groups, as well as within states but across commuting zones.[4] The final bar in Figure IV*C* shows that the patterns documented in Figure IV are similar without conditioning on college attendance rates among women. Class or education gaps in marriage are significantly larger in communities where non-college men, or men from low-income families, face challenges across a wide range of outcomes.

In Figure V, we map marriage rates for women from low-income families alongside the average earnings percentile for men from low-income families, both by childhood commuting zone. The two series are spatially correlated, with an overall correlation of 0.49 documented in Figure A.7. Regions such as the Southeast, parts of the Mid-Atlantic, and the industrial Midwest (e.g., Ohio, Indiana, and southern Michigan) stand out as areas where men from low-income families face significant challenges and women from low-income families are less likely to be married. There are notable exceptions to this pattern that warrant further investigation. For instance, in

[3]Incarceration, high school dropout, and mortality rates are multiplied by -1 so that an improvement of 1 SD in these measures is interpreted as a positive change.

[4]Commuting zones can cross state boundaries, so each commuting zone is assigned to the state where the majority of its population resides.

southern Texas, women from low-income families have very low marriage rates despite men from low-income families in the area achieving strong economic outcomes. Conversely, parts of Appalachia have relatively high marriage rates for women from low-income families, even though men in these areas face poor economic conditions.

We replicate these maps separately for White, Black, and Hispanic Americans in Figure A.6, revealing several notable differences compared to the pooled patterns across all races. For example, in parts of rural New England, such as Central Maine, White men from low-income families face poor economic outcomes, and White women from low-income families have low marriage rates. In contrast, in parts of the Southeast, such as South Carolina, Black men from low-income families perform relatively well, and marriage rates for Black women from low-income families are comparatively high. Despite these differences, Figure A.7 shows a consistent and clear correlation across all racial and ethnic groups between the outcomes of men from low-income families and the marriage rates of women from low-income families.

IV Conclusion

America is becoming increasingly polarized along education and class lines, and family dynamics are no exception (Bailey and Dynarski, 2011; Doob, 2015; Fischer and Mattson, 2009). Both historically and geographically, worsening outcomes for non-college men are closely associated with widening class gaps for women. Marriage rates among non-college women decline as non-college men struggle, whereas college women continue to marry at consistently high rates. These trends have direct implications for the resources available to children born to mothers without college degrees, potentially exacerbating growing class gaps in economic opportunity (Chetty et al., 2024; Kearney, 2022).

The polarization of family structures by class and education shows no signs of abating. In Figure A.8, we project marriage rates at age 45 for the 1994 cohort using marriage and cohabitation outcomes observed for these recent cohorts at earlier ages as a “surrogate" (Athey et al., 2019). Education gaps in marriage are likely to continue widening. Americans born in the mid-1990s are poised to become the first cohort in which marriage rates for non-college women fall below 50%.

Changing cultural norms and attitudes around marriage have undoubtedly contributed to the declining marriage rates among non-college Americans (e.g., Loscocco and Walzer, 2013; Murray, 2013). Nonetheless, our analysis underscores the substantial role of demographic and economic factors. The class polarization of marriage is particularly pronounced in cohorts and regions of the U.S. where non-college men face significant economic and social challenges. In present-day communities where non-college men are stably employed and not involved with the criminal justice system, marriage rates for non-college women remain above 60%—levels last observed nationally

for non-college women born in the mid-1950s.

Improving outcomes for non-college men—and, consequently, the marriage prospects of non-college women—is a worthy goal for researchers and policymakers alike. While some solutions may focus on labor market or economic interventions, many challenges likely extend beyond economic factors. The barriers preventing boys and men from succeeding in the labor market and becoming reliable partners in marriage may often have deeper social or cultural roots (Bertrand and Pan, 2013; Reeves, 2022). Additionally, it would be valuable to explore whether college, particularly four-year institutions, helps shape men into more dependable partners equipped to navigate modern marriages (Ananat, 2024). There is also the possibility that marriage and family itself influence men's labor market outcomes, but this channel remains insufficiently understood and warrants further study (Binder, 2021; Killewald and Lundberg, 2017). Ultimately, addressing the economic, social, and cultural challenges facing non-college men is not only vital for reducing class disparities in family formation but also for ensuring greater economic and social stability across generations.

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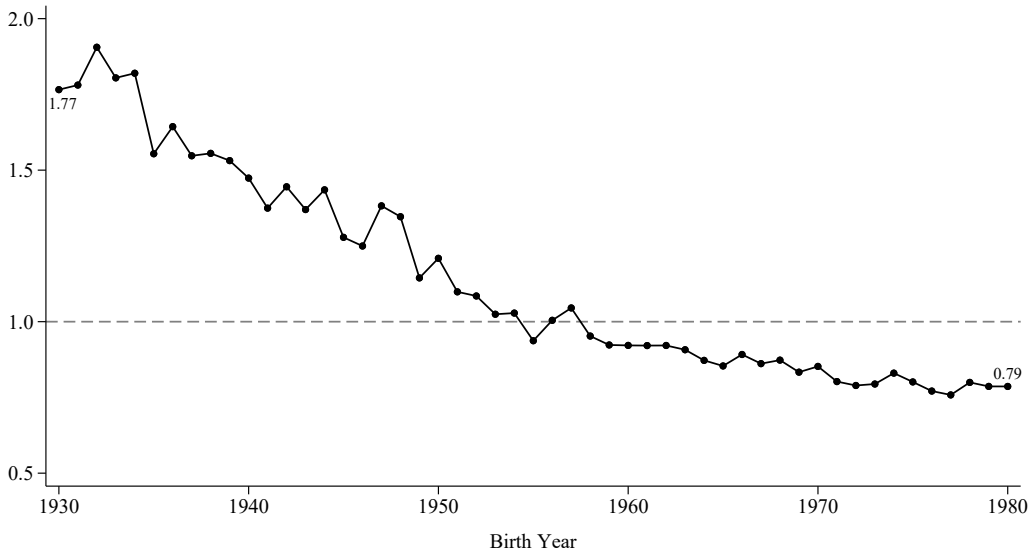
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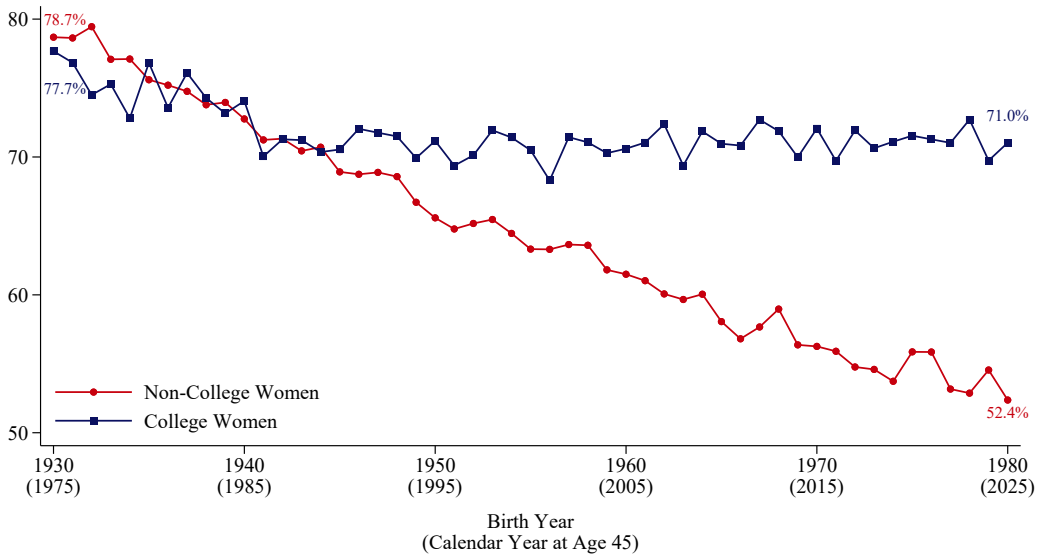
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FIGURE I: Growing Gender Gaps in Education and Education Gaps In Marriage

A: Number of College Men per College Woman (Four-Year College)



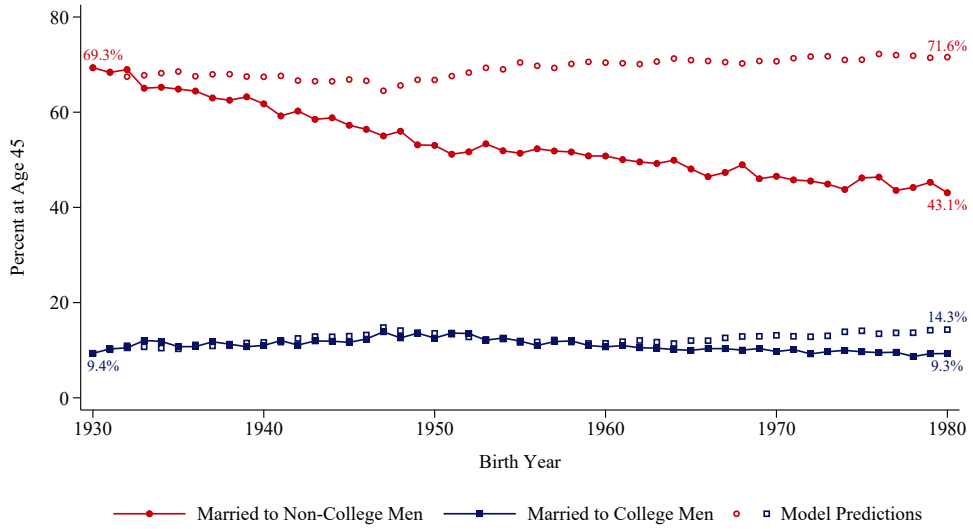
B: Percent of Women Married at Age 45 by Education



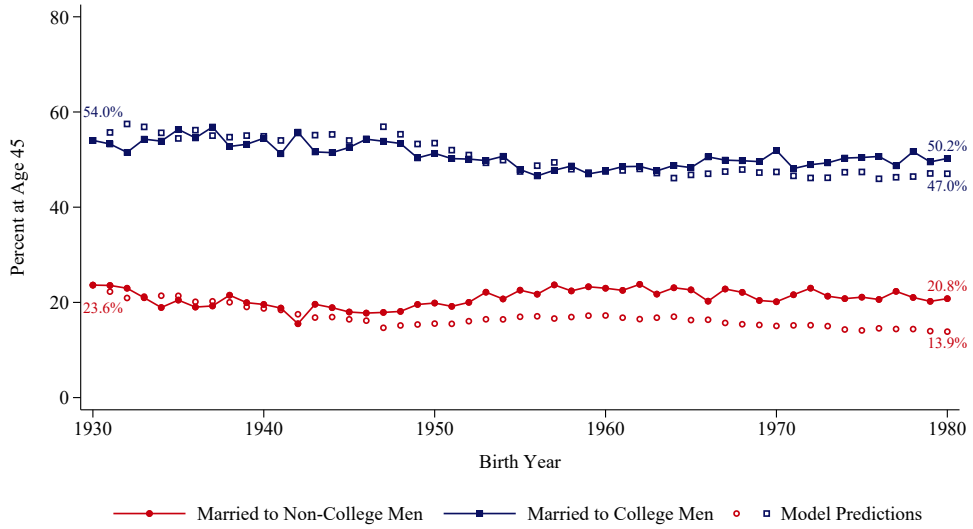
Notes: This figure shows trends in college attendance rates by gender, and female marriage rates by college attendance. The sample includes individuals born between 1930 and 1980 who were aged 40 to 49 when surveyed in the CPS. Panel A depicts the ratio of men to women who completed at least four years of college. Panel B presents the share of women who were married at the time of the survey, disaggregated by whether they completed four years of college. See Appendix A for details on sample construction and variable definitions.

FIGURE II: Trends in Marriage by Spouse Education vs. Matching Model Predictions Holding 1930 Preferences Fixed

A: Non-College Women



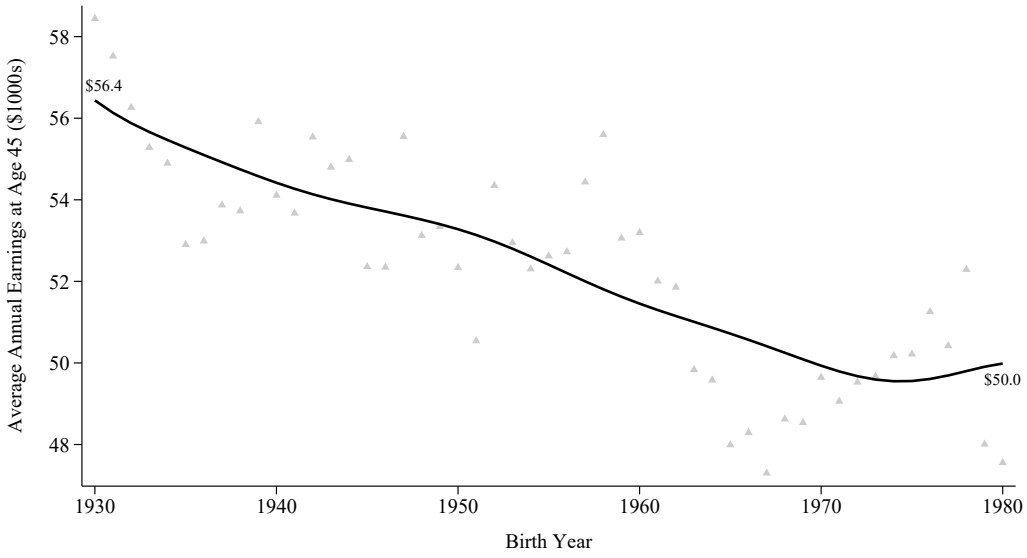
B: College Women



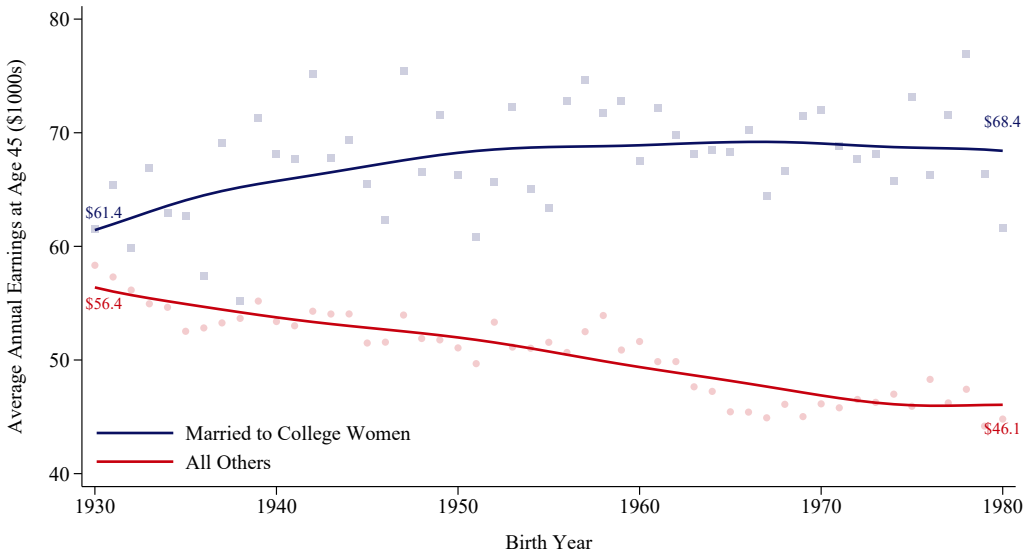
Notes: This figure illustrates changes in the share of women married to college and non-college men, alongside predictions of how these marriage rates would evolve if preferences remained constant at levels estimated for the 1930 birth cohort. The sample includes individuals born between 1930 and 1980 who were aged 40 to 49 when surveyed in the CPS. Panel A depicts the share of women without a four-year college degree married to a spouse with (blue line) or without (red line) a four-year college degree. Hollow circles are predicted marriage rates of these same two series, derived from a (Choo and Siow, 2006) model that holds preferences fixed at 1930 levels while allowing college attendance rates by gender to evolve as observed in the data. Panel B provides equivalent information for women with a four-year college degree. See Appendix A for details on sample construction and variable definitions, and Appendix B for details on model predictions.

FIGURE III: Declines in Real Earnings for Non-College Men

A: All Non-College Men



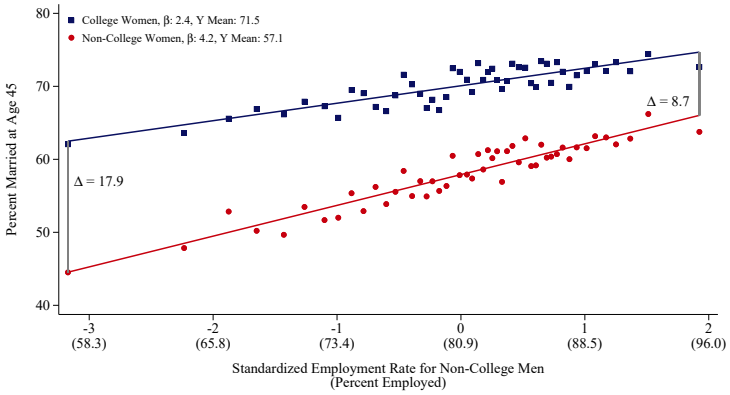
B: Separately for Non-College Men Married to College Women



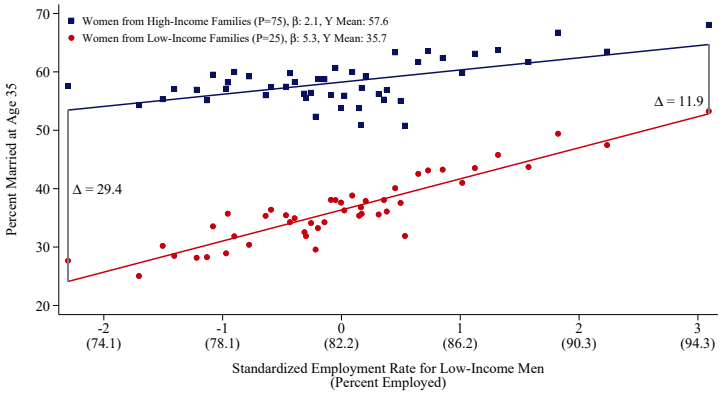
Notes: This figure illustrates trends in earnings for non-college men. The sample includes men born between 1930 and 1980 who had fewer than four years of college attendance and were aged 40 to 49 when surveyed in the CPS. Panel A presents average annual wage and salary earnings for all non-college men. Panel B disaggregates the analysis, showing earnings separately for non-college men married to a college woman and all others. Earnings are measured in thousands of 2024 dollars, adjusted for inflation using the CPI-U. See Appendix A for details on sample construction and variable definitions.

FIGURE IV: Marriage for Women vs. Area-Level Outcomes for Men

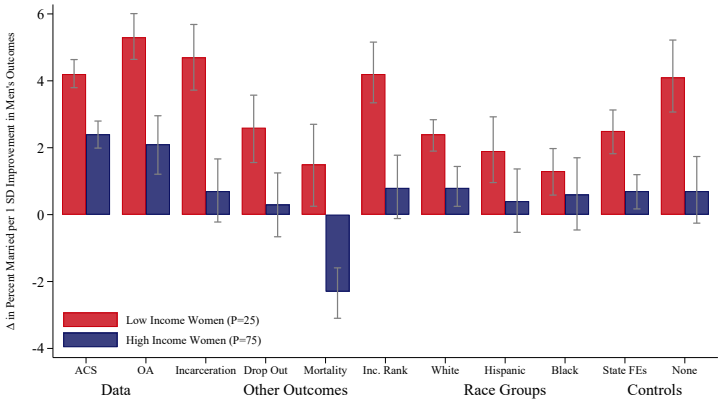
A: Adulthood Location; by Education



B: Childhood Location; by Parental Income



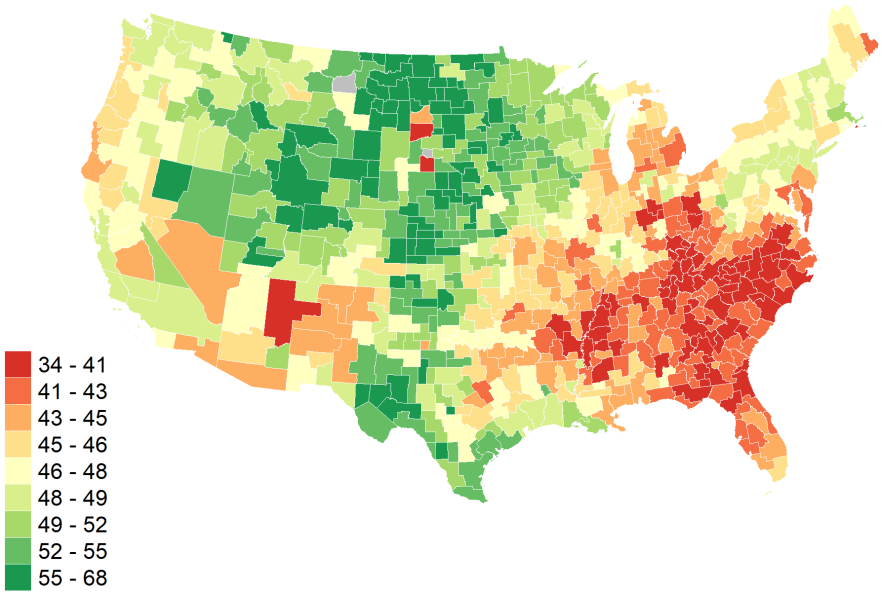
C: Association Between Marriage and Men's Outcomes



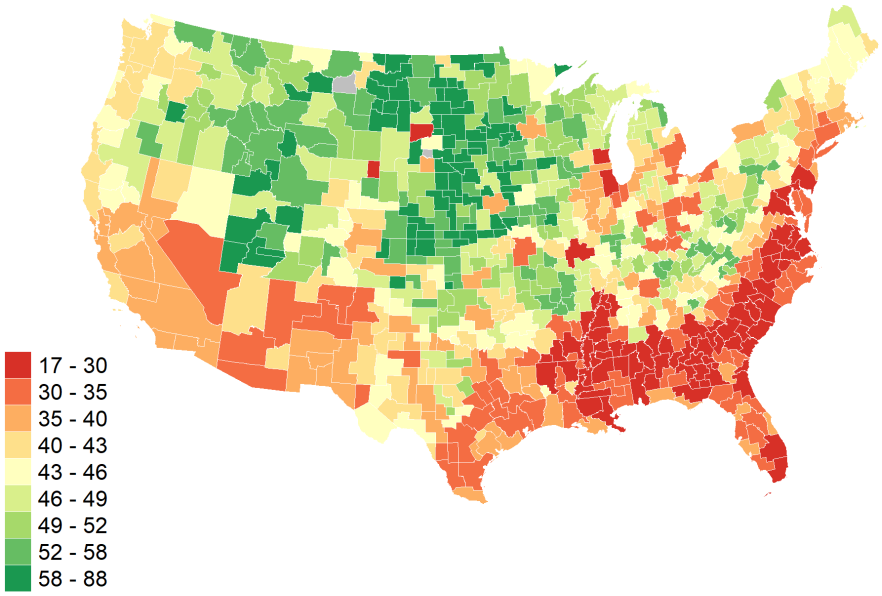
Notes: This figure shows the area-level association between women's marriage rates and men's outcomes. In Panel A, we use data from the 2018–2022 American Community Survey (ACS) to create a binned scatter plot of marriage rates for individuals aged 40–49, separately for college and non-college women, against employment (EPOP) rates for non-college men. Data are at the Public Use Microdata Area (PUMA) level, with EPOP for non-college men standardized by across-PUMA variance. Panel B presents a similar analysis using data from (Chetty et al., 2018) and (Chetty et al., 2016) at the commuting zone level, focusing on individuals born between 1978–1983. Instead of conditioning on college attendance, the data are split by parental income (25th vs. 75th percentile). Marriage rates are measured at ages 32–37, while male employment is measured in 2015 using ACS data, standardized by the across-commuting-zone variance. We regress the x and y variables (for each sample) on the area's overall female college attendance rate in Panel A and the share of women that were born to parents below the median household income in Panel B, and plot the residuals after adding back the mean of each series. Panel C extends the analysis in Panel B to various subgroups and male outcomes. The first two bars replicate the slopes from Panels A and B. Subsequent bars replace male employment for low-income families with outcomes such as incarceration, high school dropout rates, mortality rates and individual earnings rank (based on W-2 data). We multiply incarceration, high school dropout, and mortality by -1 so that an increase of 1 SD can be interpreted as the effect of these measures *improving* by 1 SD. Additional bars show the earnings rank relationship for racial subgroups (White non-Hispanic, Black non-Hispanic, and Hispanic) and repeat the earnings rank analysis while controlling for state fixed effects and omitting the female low-income share control. All series are weighted by total population in the respective datasets. See Appendix A for details on sample construction and variable definitions.

FIGURE V: The Geography of Female Marriage and Male Earnings

A: Individual Income Percentile; Men From Low-Income (P=25) Families



B: Percent Married; Women from Low-Income (P=25) Families



Notes: This figure shows spatial variation in income and marriage rates using data from (Chetty et al., 2018) at the commuting zone level, focusing on individuals born between 1978–1983. Panel A depicts the mean individual earnings rank in 2015 (based on W-2 data) for men born to parents at the 25th income percentile in each commuting zone. Panel B shows the marriage rates of women born to parents at the 25th income percentile, measured between ages 32–37.

Supplementary Appendix

A Data and Variable Definitions

Our analysis uses data from the Current Population Survey (CPS), the American Community Survey (ACS), and the Opportunity Atlas (OA) to measure educational attainment, marriage, and economic outcomes among American adults across time and geographic regions (Flood et al., 2024; Ruggles et al., 2024; Chetty et al., 2016, 2018).

We use consistent variable definitions for the CPS and ACS. The CPS provides a reliable annual time series dating back to 1968, while the 5-year ACS file offers a larger sample size that supports cross-area comparisons. In addition, we draw on OA data for complementary geographic analyses with an expanded set of outcomes, though these data rely on different samples and variable definitions.

Household survey data

Sample. We focus on respondents who are 40–49 years old at the time of the survey. For simplicity, we refer to their marriage outcomes as representing marriage rates at age 45. For historical analyses, we use the CPS March Annual Social and Economic Supplement (ASEC) files from 1968–2024, covering birth cohorts from 1930–1980. For cross-area analyses, we rely on the 2017–2021 5-year ACS file.

Education. Our primary education measure is college completion, defined as obtaining a four-year college degree or higher. Prior to 1992, the CPS asked respondents for their highest grade of school completed but not about degree completion. For those years, we define college completion as having attended at least 4 years of college.

Marriage. Results in our historical analysis rely on information on spousal education. In the CPS, spousal education can only be observed for married heads of households and for the spouses of married heads of households. Therefore, our primary marriage definition for those results is being either a household head with a spouse present or the spouse of a household head. This definition mis-classifies 1.3% of the sample who report being married with a spouse present in the survey question on marital status but whom we classify as single. There is no noticeable difference in marriage rate trends between the two definitions. For the cross-area analysis using the ACS, we employ the person-based marital status variable.

Fertility. Figure A.2 presents supplementary results on fertility trends. For historical trends, we rely on the CPS Fertility and Marriage Supplement, which asks respondents about the number of live births ever had. By contrast, the ACS–which we use for cross-area analysis–does not ask respondents directly about fertility. For those results, we instead define a derived fertility measure as being the head of household or their spouse or unmarried partner with at least one own child

under age 18 living at home at the time of the survey. To account for the fact that mothers' age at childbirth varies systematically by education, we use a slightly broader sample window and focus on respondents at ages 25-44.

Economic Outcomes. We measure earnings using pre-tax wage and salary income, adjusted to current U.S. dollars using the CPI-U. Employment status is taken directly from the respective survey questions in both the CPS and ACS.

Geography. For the ACS cross-area results, we define areas using the Public Use Microdata Area (PUMA) associated with the respondent's household at the time of the survey.

Opportunity Atlas Data

Sample. The OA provides cross-area adulthood outcome estimates by parent income and childhood location. The main OA estimates we use are based on individuals born between 1978–1983, as recorded in Census and tax data.

Parent Income. OA estimates are available by parent income percentile during an individual's childhood. We interpret this as a proxy for socioeconomic status. Our analysis compares outcomes for individuals from families at the 25th percentile of the parent income distribution to those from families at the 75th percentile.

Marriage and Economic Outcomes. From the OA, we use measures of marriage, employment, incarceration, educational attainment, and individual income ranks. Chetty et al. (2018) provide detailed variable definitions. We also incorporate a life expectancy measure from Chetty et al. (2016), which is defined by adulthood location rather than childhood location.

Geography. OA estimates are reported at the childhood commuting zone level. These estimates are weighted by exposure, reflecting the number of years a child resided in each commuting zone prior to reaching age 18.

B Matching Model

We use the transferable utility model of the marriage market developed by Choo and Siow (2006). The following description closely follows the presentation of the Choo and Siow (2006) model as outlined in Goldman, Gracie and Porter (2024). In our application, there are two types of individuals: college and non-college. Men's types are indexed by j, and women's types are indexed by k. Preferences for men,

$$U^m_{k,i} = \alpha^m_{j(i),k} - \tau_{j(i),k} + \varepsilon_{k,i}, \tag{B1}$$

and women,

$$U^w_{j,i} = \alpha^w_{j,k(i)} + \tau_{j,k(i)} + \varepsilon_{j,i}, \tag{B2}$$

where α is the systematic component, τ represents transfers, and ε is the idiosyncratic component. The idiosyncratic component follows a Type I extreme value distribution. For men, $U^m_{k,i}$ reflects the preference of individual i, who is a type $j(i)$ man, for marrying a type k woman. Similarly, $U^w_{j,i}$ represents the preference of individual i, a type $k(i)$ woman, for marrying a type j man.

Marital surplus,

$$\gamma_{j,k} \equiv (\alpha^m_{j,k} + \alpha^w_{j,k}) - (\alpha^m_{j,0} + \alpha^w_{0,k})$$

captures the value of a j,k marriage relative to the utility j and k would attain if they were single. Choo and Siow (2006) show that the equilibrium number of matches between types j and k,

$$\mu_{j,k} = \sqrt{e^{\gamma_{j,k}} \mu_{j,0} \mu_{0,k}}, \tag{B3}$$

is a function of the marital surplus and the number of types j and k who remain single, $\mu_{j,0}$ and $\mu_{0,k}$. The equilibrium also must obey adding up: the total number of type t in the market must be equal to the sum of the number of t who marry and the number who remain single:

$$m_j = \mu_{j,0} + \sum_{k=1}^{T} \mu_{j,k}$$
$$w_k = \mu_{0,k} + \sum_{j=1}^{T} \mu_{j,k}.$$

Substituting the expression for the equilibrium number of matches, $\mu_{j,k}$, into the adding up constraints yields a concise definition of the model equilibrium,

$$m_c = \mu_{c,0} + \sqrt{e^{\gamma_{c,c}} \mu_{c,0} \mu_{0,c}} + \sqrt{e^{\gamma_{c,n}} \mu_{c,0} \mu_{0,n}} \tag{B4}$$
$$m_n = \mu_{n,0} + \sqrt{e^{\gamma_{n,c}} \mu_{n,0} \mu_{0,c}} + \sqrt{e^{\gamma_{n,n}} \mu_{n,0} \mu_{0,n}} \tag{B5}$$
$$w_c = \mu_{0,c} + \sqrt{e^{\gamma_{c,c}} \mu_{c,0} \mu_{0,c}} + \sqrt{e^{\gamma_{n,c}} \mu_{n,0} \mu_{0,c}} \tag{B6}$$
$$w_n = \mu_{0,n} + \sqrt{e^{\gamma_{c,n}} \mu_{c,0} \mu_{0,n}} + \sqrt{e^{\gamma_{n,n}} \mu_{n,0} \mu_{0,n}}. \tag{B7}$$

This is a system of four equations and four endogenous variables.

We estimate the model under the assumption that marriage markets are closed within birth cohorts and that all marriages are exclusively opposite-sex. The model predictions in Figure II

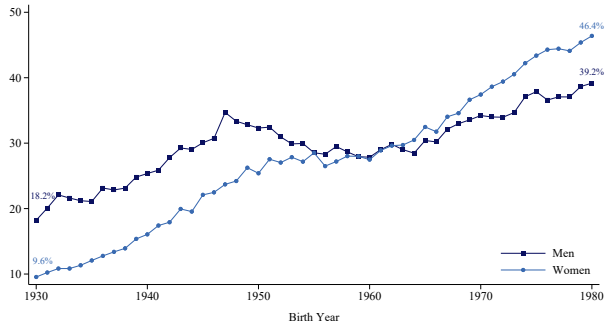
are constructed using values of μ based on female marriage outcomes for the 1930 cohort. For instance, $\mu_{c,n}$ represents the fraction of non-college women born in 1930 who married college men. The share of type j men who remained single ($\mu_{j,0}$) was imputed using $\mu_{c,n}$ and the observed m_j for the 1930 cohort.

Using these initial μ values, we estimate γ^{1930} based on Equation B3. We then allow m_j and w_k to evolve across cohorts as observed in the data, while holding γ fixed at γ^{1930}. This approach enables us to estimate how μ changes over time by solving Equations B4–B7. Because the initial μ used to estimate γ^{1930} were defined based on female marriage outcomes, the model predictions align perfectly with the data for the 1930 cohort.

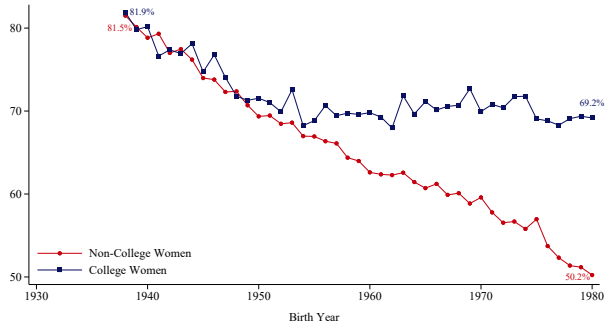
In Figure A.4, we construct analogous series for men by estimating γ^{1930} using male-specific μ values.

FIGURE A.1: Trends in Education and Marriage; Alternative Samples

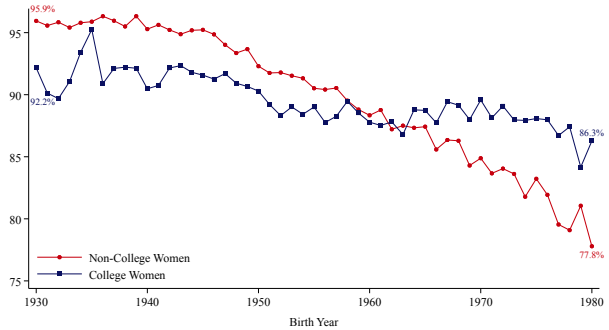
A: Percent with Four-Year College



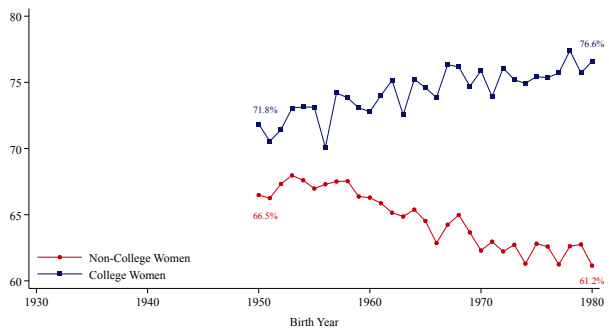
B: Percent of Women Married at Age 35



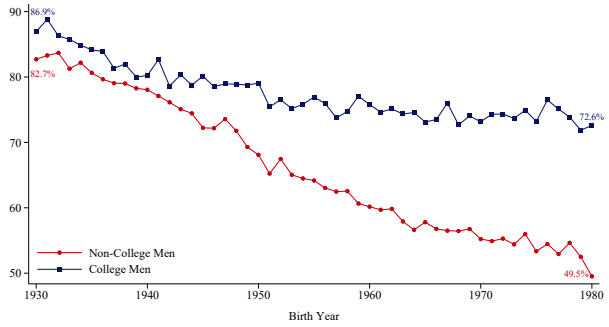
C: Percent of Women Ever Married by Age 45



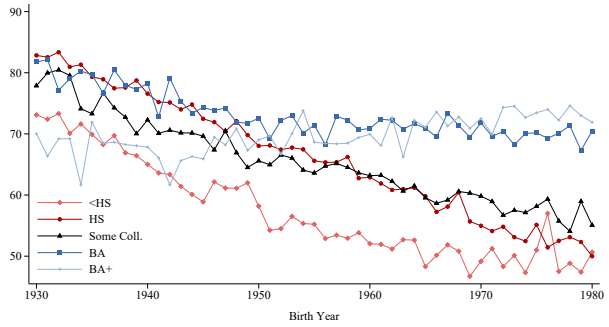
D: Pct. of Women Married/Cohabiting at Age 45



E: Percent of Men Married at Age 45



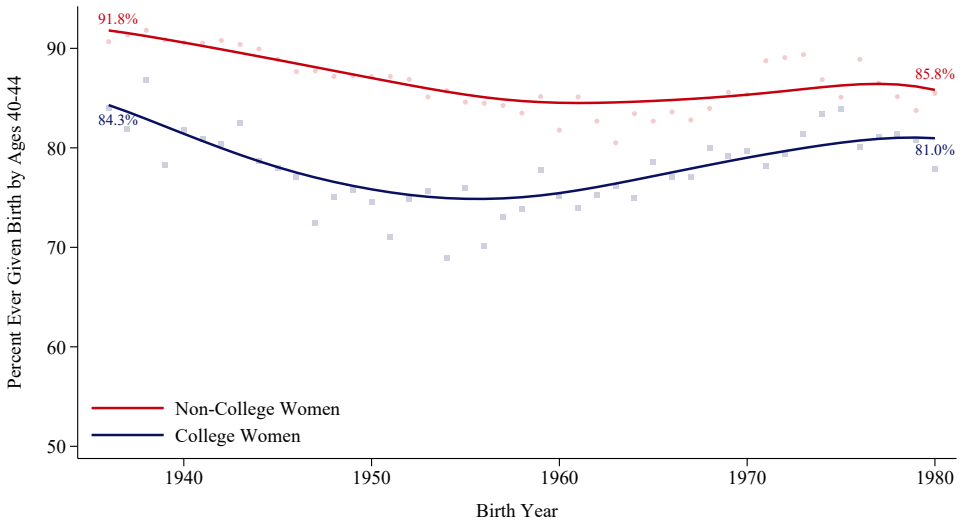
F: Percent of Women Married at Age 45



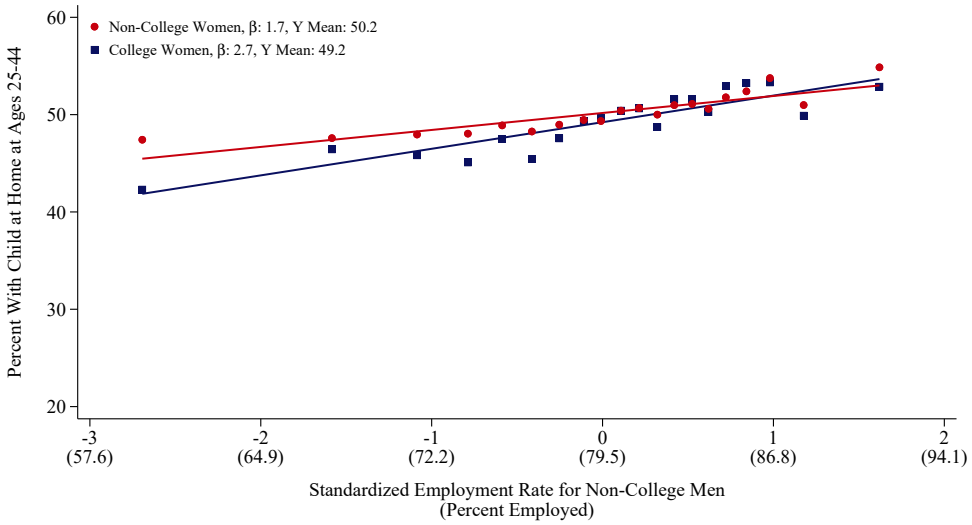
Notes: This figure presents trends in college attendance and marriage rates across various definitions and samples. Panel A shows the underlying data from Figure I.*A*, illustrating the share of women and men who attended at least four years of college by birth year. Panel B modifies Figure I.*B* by using a sample of women surveyed in the CPS at ages 30–39, focusing on cohorts with data spanning the full range of ages. Panel C replicates Figure I.*B* but examines the share of women "ever married" by age 45. Panel D replicates Figure I.*B*, including women who are living with an unmarried partner. Panel E replicates the analysis from Figure I.*B* for men. Panel F extends Figure I.*B* by including detailed education categories: more than four years of college, some college (fewer than four years), a high school diploma, and less than a high school education. See Appendix A for details on sample construction and variable definitions.

FIGURE A.2: Historical Trends and Cross-Area Variation in Fertility

A: Percent of Women Who Have Given Birth

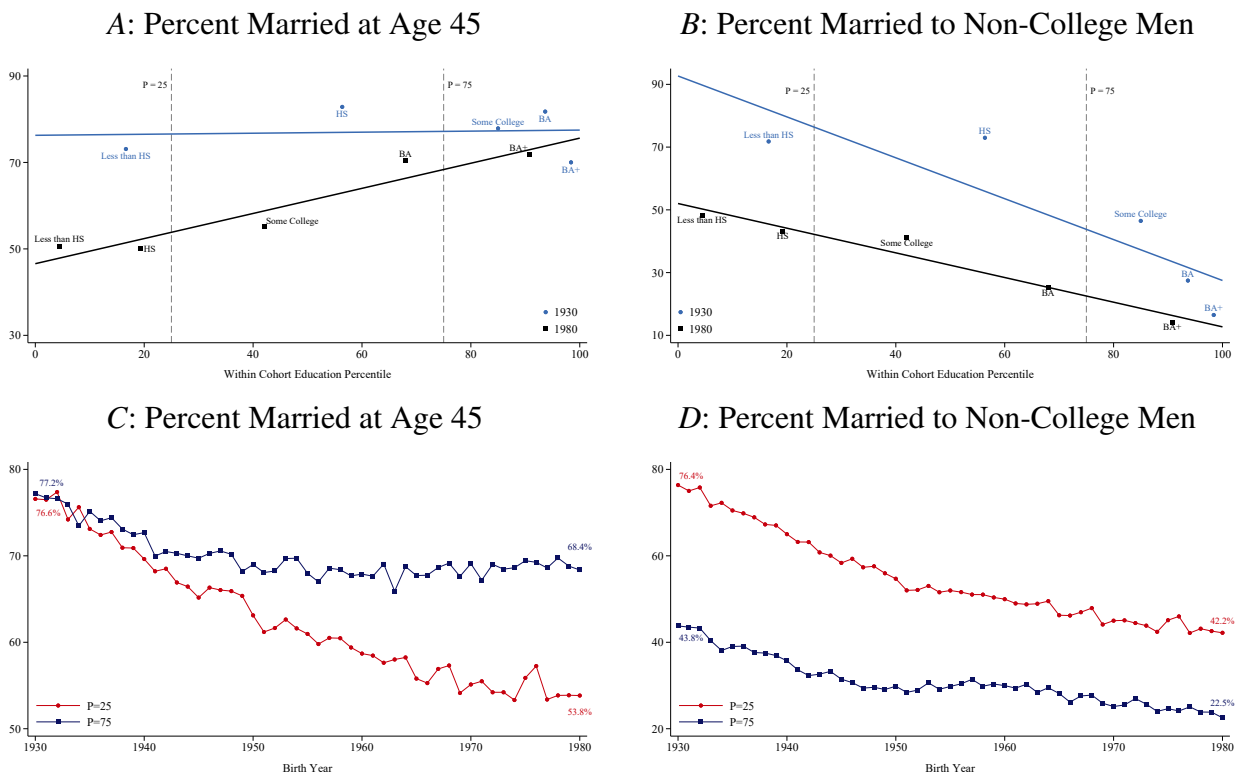


B: Child-at-Home Rates vs. Male Employment Rates (2017-2021)



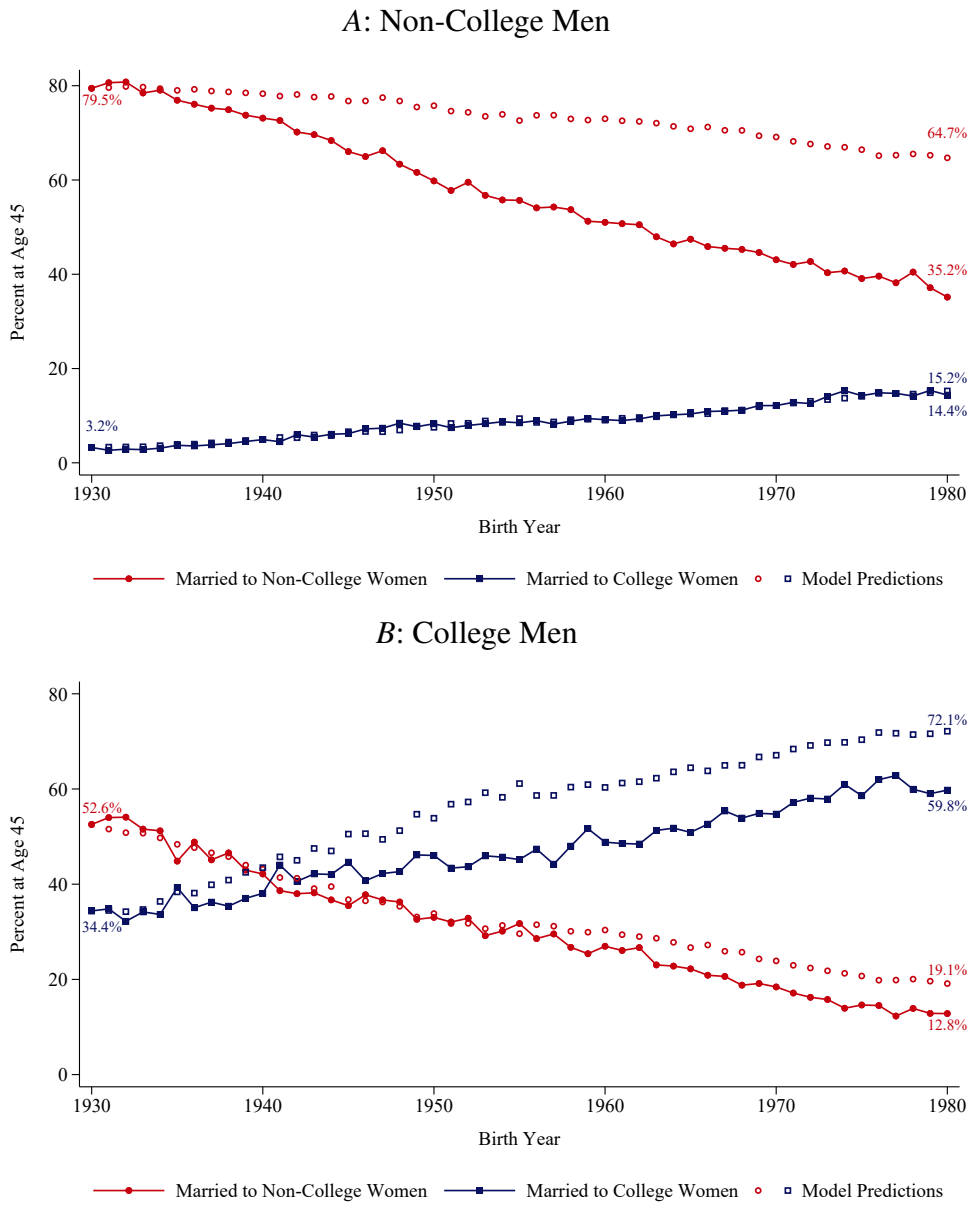
Notes: This figure shows historical trends and current cross-area patterns in fertility for women with and without a four-year college degree. Panel A is analogous to Figure I*B* and is based on the CPS Fertility and Marriage Supplement; it plots the share of women born between 1936 and 1980 who have ever had at least one live birth by ages 40-44. Panel B is analogous to Figure IV*A* and is based on the 2017-2021 5-year ACS. The ACS does not directly ask respondents about fertility, so we define a derived measure as being head of household or their spouse with at least one own child living at home at the time of the survey ("child-at-home"). The sample is restricted to respondents at ages 25-44. Panel B shows a binned scatter plot of child-at-home rates, separately for college and non-college women, against employment rates for non-college men (EPOP). Data are the the Public Use Microdata Area (PUMA) level, with EPOP standardized by across-PUMA variance. Child-at-home rates and male EPOP are residualized on the PUMA's female college attendance rate. See Appendix A for details on sample construction and variable definitions.

FIGURE A.3: Marriage by Women's Relative Education Rank



Notes: This figure shows the changing marriage rates for women at different education percentiles by birth year. Panels A and B plot marriage rates for women against their education percentile across detailed education categories—less than high school, high school diploma, some college (fewer than four years), four years of college, and more than four years of college—for women born in 1930 (blue line) and 1980 (black line). Panels C and D plot marriage rates for women against their birth year for women who were at the 25th (red line) and 75th (blue line) percentile of education among women born at the same time as them. Panels A and C show the percent of women at each education level who were married at the time of the CPS. Panels B and D shows the percent of women at each education level who were married to a man without a four-year college degree. The sample includes individuals aged 40–49 when surveyed in the CPS. See Appendix A for details on sample construction and variable definitions.

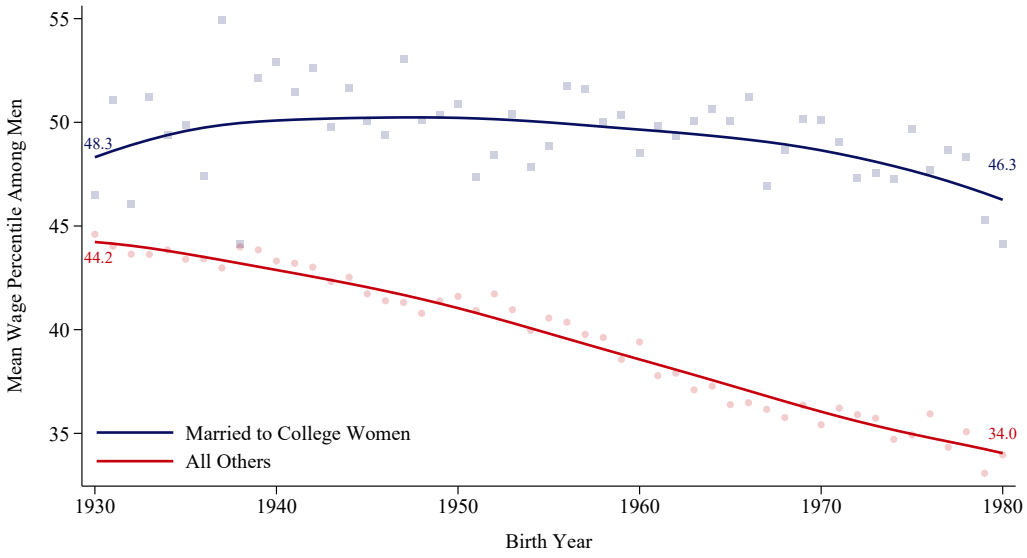
FIGURE A.4: Trends in Male Marriage Outcomes vs. Matching Model Predictions Holding 1930 Preferences Fixed



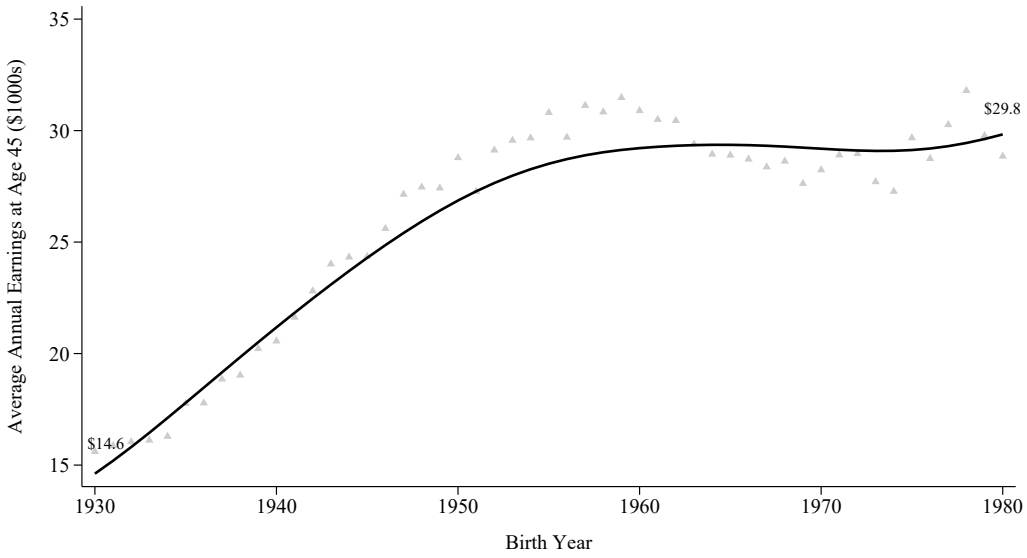
Notes: This figure illustrates changes in the share of men married to college and non-college women, alongside predictions of how these marriage rates would evolve if preferences remained constant at levels estimated for the 1930 birth cohort. The sample includes individuals born between 1930 and 1980 who were aged 40 to 49 when surveyed in the CPS. Panel A depicts the share of men without a four-year college degree married to a spouse with (blue line) or without (red line) a four-year college degree. Hollow circles are predicted marriage rates of these same two series, derived from a (Choo and Siow, 2006) model that holds preferences fixed at 1930 levels while allowing college attendance rates by gender to evolve as observed in the data. Panel B provides equivalent information for men with a four-year college degree. See Appendix A for details on sample construction and variable definitions, and Appendix B for details on model predictions.

FIGURE A.5: Trends in Earnings for Non-College Men and Women

A: Individual Income Percentile for Non-College Men



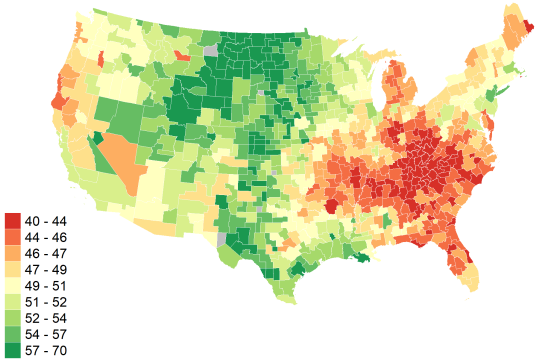
B: Real Earnings for Non-College Women



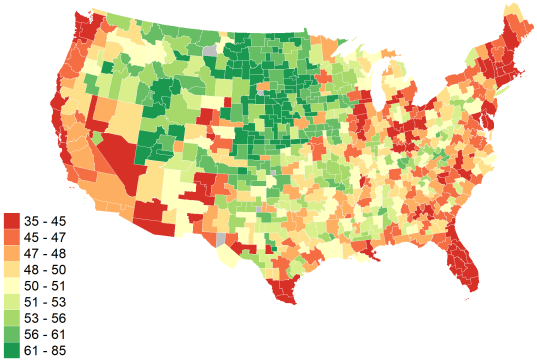
Notes: This figure shows trends in earnings for non-college men and women. The sample includes individuals born between 1930 and 1980 who had fewer than four years of college attendance and were aged 40–49 when surveyed in the CPS. Panel A depicts the average annual wage and salary earnings percentile for non-college men, ranked among all men of the same age and birth cohort, separately for those married to a college woman and all others. Panel B shows the average annual wage and salary earnings for all non-college women. Earnings are expressed in thousands of 2024 dollars, adjusted for inflation using the CPI-U. See Appendix A for details on sample construction and variable definitions.

FIGURE A.6: The Geography of Female Marriage and Male Earnings by Race

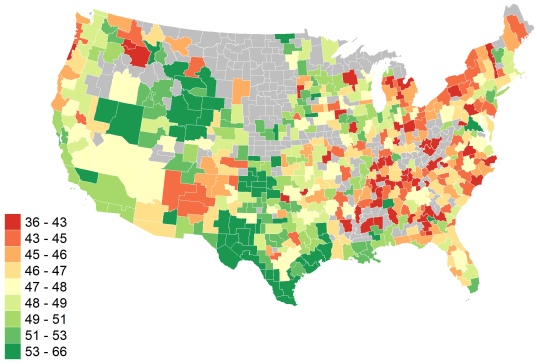
A: White Men; Income Percentile



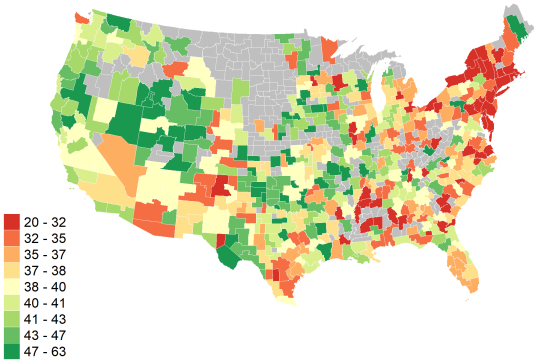
B: White Women; Percent Married



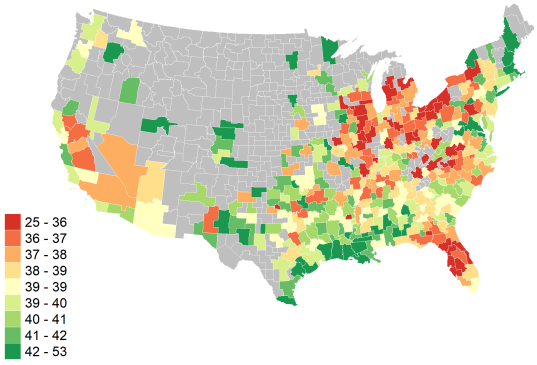
C: Hispanic Men; Income Percentile



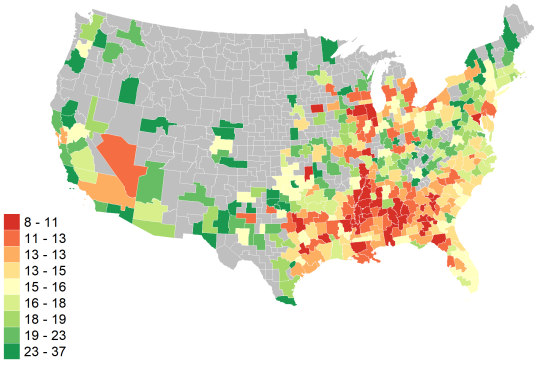
D: Hispanic Women; Percent Married



E: Black Men; Income Percentile

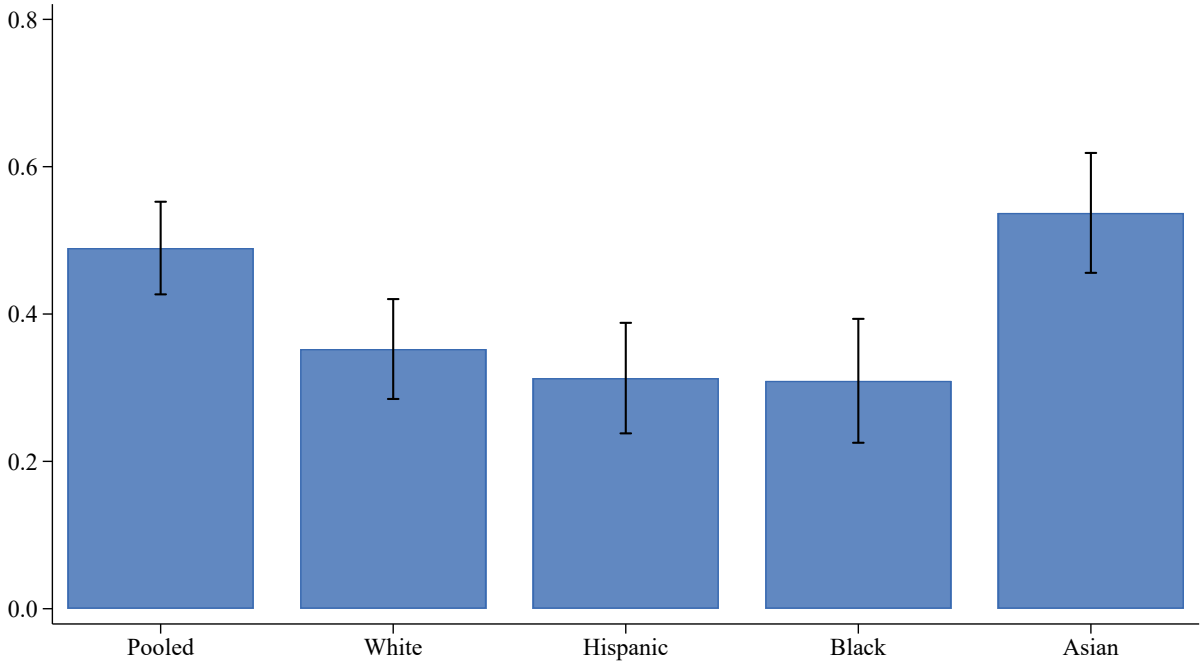


F: Black Women; Percent Married



Notes: This figure shows spatial variation in income and marriage rates by racial group using data from (Chetty et al., 2018) at the commuting zone level, focusing on individuals born between 1978–1983. Panels A and B display results for White non-Hispanic men and women, Panels C and D for Hispanic individuals, and Panels E and F for Black non-Hispanic individuals. The left-hand panels show the mean individual earnings rank in 2015 (based on W-2 data) for men born to parents at the 25th income percentile in each commuting zone. The right-hand panels present the marriage rates of women born to parents at the 25th income percentile, measured between ages 32–37.

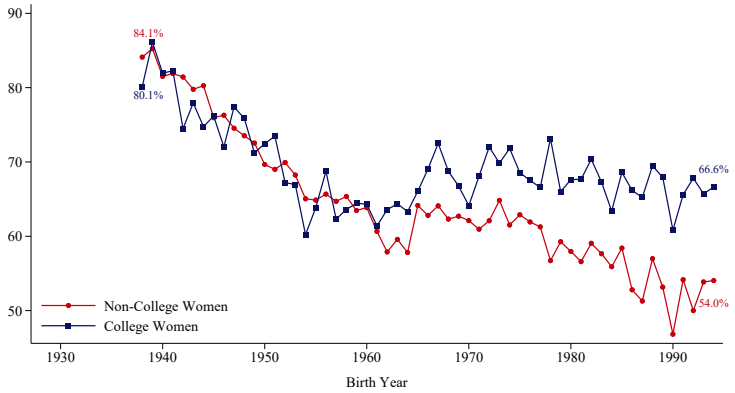
FIGURE A.7: Correlation Between Marriage Rates for Women and Earnings for Men from Low-Income Families at the Commuting Zone-Level



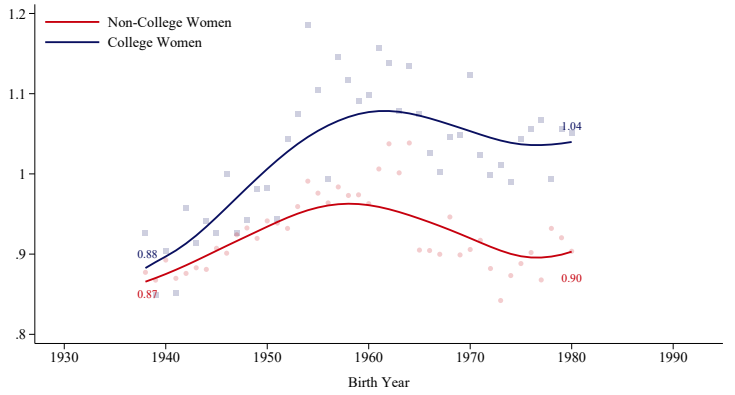
Notes: This figure shows the commuting zone-level correlation between income and marriage rates using data from (Chetty et al., 2018), focusing on individuals born between 1978–1983. The first bar represents the correlation between the mean individual earnings rank in 2015 (based on W-2 data) for men born to parents at the 25th income percentile and the marriage rates of women born to parents at the same income level, measured between ages 32–37, weighted by the population below median income levels. The next four bars show the same correlations, disaggregated by race (White non-Hispanic, Hispanic, Black non-Hispanic, and Asian), with both marriage rates and earnings calculated within each subgroup. Correlations are weighted by the number of children in each group who grew up in each commuting zone.

FIGURE A.8: Forecasting Marriage Outcomes for Recent Cohorts

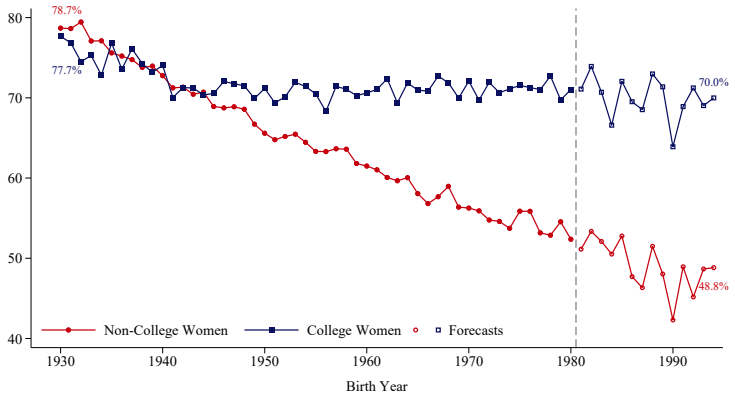
A: Percent of Women Married/Cohabiting at Age 30



B: Ratio of Women Married at Age 45 versus Age 30



C: Percent of Women Married at Age 45 by Education



Notes: This figure shows trends in marriage rates for college and non-college women, including forecasts of age-45 marriage rates for recent cohorts (1981–1994). Panel A replicates I*B*, showing the share of non-college and college women who are married, but also includes those listed in the CPS as unmarried but cohabiting with a partner at age 30. Panel B presents the ratio of women married at ages 40–49 (as shown in Figure I*B*) to those married or cohabiting at age 30, by cohort. Panel C uses these ratios from Panel B to project marriage rates at ages 40–49 for cohorts born between 1981 and 1994, based on the data shown in Panel A. See Appendix A for details on sample construction and variable definitions.