

Returns to Education for Women in the Mid-Twentieth Century: Evidence from Compulsory Schooling Laws *

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Abstract

Women had a similar level of schooling to men during the mid-twentieth century United States, but research on the returns to education for women is scarce. Using compulsory schooling laws as instrumental variables, this paper examines the causal effect of education on women's labor market and marriage market outcomes. I show that an additional year of education increased women's probability of gainful employment by 7.1 pp. and being in a skilled occupation by 1.2 to 3.3 pp. The positive returns in the labor market were larger for women from lower socioeconomic backgrounds and women from rural areas. On the other hand, education did not affect women's probability of marriage, but it increased their probability of divorce and separation by 1.4 pp. Conditional on marriage formation, there is evidence of assortative mating and a positive effect of women's education on the husband's employment and wage earnings, which suggests an increasing level of education for women led to a better match in the marriage market. Women from lower socioeconomic backgrounds also benefited more in the marriage market.

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1 Introduction

Women and men had similar educational attainment during the early 20th-century United States. Although the returns to education for men during this period have been well-studied (Goldin and Katz 2000; Feigenbaum and Tan 2020; Clay et al. 2021), the returns to education for women remain less understood. On the one hand, a woman with higher educational attainment “could secure a position as a clerk, stenographer, or, better yet, a secretary,” and on the other hand, women would also have “a better chance of securing a higher income husband” (Goldin and Katz 2008). This paper aims to understand how education affects women’s economic and social opportunities by examining the returns to education for women in the labor market and marriage market.

To establish the causal effect of education, I instrument years of education completed with state-level legislation on compulsory attendance, child labor, and school continuation following Clay et al. 2021. The instrumental variable approach explores cohort-by-state variations in the length of compulsory attendance. The validity of the IV strategy is well-established for men (Stephens and Yang 2014; Clay et al. 2021), but this is one of the few papers to document the positive and significant relationship between years of compulsory attendance and women’s educational attainment. I show that laws requiring children to attend school for seven, eight, and nine years or above positively affected women’s educational attainment, and the magnitudes of the effects are comparable to those of men.

I use the complete-count decennial census data from 1940 to study birth cohorts born between 1885 and 1912 that were affected by state compulsory schooling laws (Ruggles et al. 2021). I further restrict the sample to native-born White women since they were more likely to be affected by compulsory attendance laws than foreign-born women and Black women. In addition, I also use the Census Tree linked data to examine the returns to education for women by their socioeconomic backgrounds (Price et al. 2021; Buckles et al. 2023a). Women’s socioeconomic background is measured by their father’s occupational scores, whether their fathers worked on the farm, and whether they lived in urban or rural areas.

First, I show that women experienced large returns to education in the labor market and women from lower socioeconomic backgrounds benefited more. In particular, the two-stage-least-square (2SLS) estimate indicates that an additional year of schooling increased women’s

probability of having a gainful occupation by 7.1 percentage points, which is a large effect since only 25% of women in the sample were gainfully employed in 1940. The effect is 8.2 pp. for women of lower socioeconomic backgrounds (16.3% of whom were working in 1940) and 4 pp. for women of higher socioeconomic backgrounds (24.5% of whom were working in 1940). Furthermore, conditional on earning positive wages, an additional year of schooling increased working women's wage earnings by 16.9%. This large effect could be due to women entering higher-paying skilled occupations since an additional year of schooling increased the probability of a stenographer/clerical worker/bookkeeper by 1.2 to 3.3 pp.

Next, I present positive returns to education for women regarding their marriage market outcomes. The outcomes include women's decision to marry/divorce and the match quality between the wife and the husband. I first show that an additional year of education did not affect the women's probability of marriage on average, but it increased the probability of being never married in 1940 for those of lower socioeconomic backgrounds. This could imply that education allowed women of lower socioeconomic backgrounds to search in the marriage market for longer. On the other hand, an additional year of education increased women's probability of divorcing or separating by 1.4 pp., a large increase relative to the average share of 2.5% of women who had been divorced or separated. This finding suggests that more education helped women leave marriages, possibly because educated women could support themselves financially.

I show that a higher level of education allowed women to get a better match in the marriage market, which is reflected by the husband's labor market outcomes. Conditional on marriage formation and the husband's education, an additional year of the wife's education reduced the probability of the husband being unemployed by 3.16 pp. This is a large effect since the unemployment rate was 13% in 1940, only a few years after the Great Depression. In addition, I also show that an additional year of education attained by the wife increased the husband's wage earnings by 8.5%, but it did not change the husband's labor supply. Finally, examining the heterogeneous effects suggests women of lower socioeconomic backgrounds benefited more from education in the marriage market as well.

I advance the literature in several directions. First, I focus on how legislative actions helped people achieve higher educational attainment and, in turn, affected future labor market and marriage market outcomes. My paper is not only related to past work studying the effect of compulsory schooling laws (Angrist and Krueger 1991; Schmidt 1996; Margo and Finegan 1996;

Lleras-Muney 2002; Goldin and Katz 2008; Stephens and Yang 2014; Clay et al. 2012a; Gihleb and Lang 2016; Rauscher 2016; Clay et al. 2021), but also related to research studying the effect of the G.I. Bill on education and earnings (Bound and Turner 2002; Angrist and Chen 2011; Lennon 2021), the effect of female-specific protective legislation on women’s employment (Haddad and Kattan 2024), and the effect of women’s suffrage on children’s education (Kose et al. 2021).

In addition, my findings add new insights into the large literature on returns to schooling in the United States (Angrist and Krueger 1991; Card 1993; Goldin and Katz 2008; Oreopoulos and Salvanes 2011; Stephens and Yang 2014). The estimates on the returns to schooling in the labor market are larger for women than those for men in Feigenbaum and Tan 2020, which is consistent with evidence in the broader literature showing that the education coefficient is often higher for women (Mincer and Polachek 1974; Corcoran and Duncan 1979; Kane and Rouse 1995; Card 1999; Dougherty 2005, to name a few). The fact that only a quarter of women were employed may explain this, as education likely served as a stronger signal of ability and productivity for women, resulting in higher relative returns compared to men.

Lastly, I contribute to the growing literature on women’s marriage during the historical United States (Craig et al. 2019; Olivetti et al. 2022; Lafortune et al. 2022; Bailey and Lin 2022; LaGuardia and Niemesh 2023). While past research focuses on assortative mating by education and socioeconomic background often suggests a positive correlation between women’s education and the probability of never marrying, I show that the effect might not be causal and education delayed but did not deter marriage.

2 Background and Data

2.1 State Laws on Compulsory Attendance, Child Labor, and Continuation

State-level legislation on compulsory attendance, child labor, and school continuation was enacted between the 1850s and the 1910s to specify the period during which children should be in school. There are significant variations in the components of these laws across states.

Among the three categories of laws to keep children in school, compulsory attendance laws were established the earliest. The laws set a minimum school entry age, a maximum school leaving age, and a minimum period that children should be in school. Massachusetts was the

first state to enact compulsory attendance laws in 1852, and other states in the Northeast (such as Vermont and New Hampshire) followed suit quickly, establishing their own compulsory attendance laws in the 1860s and 1870s. States in the south, on the other hand, generally did not establish compulsory attendance laws until the early 1900s. By 1920, all states in the U.S. had established compulsory attendance laws.

Over the years, compulsory attendance laws were updated to increase the length of mandatory attendance, such as by lowering the minimum entry age and increasing the maximum leaving age. In some cases, truant officers and fines were established to enforce compliance with the laws. According to W.E.B. Du Bois, who grew up in a small town in western Massachusetts, “truant laws were enforced” and he was brought up with “the idea of regular attendance at school” (Du Bois [1983](#), page 12).

Complementary to the compulsory attendance laws, a large wave of state-level child labor laws was introduced during the early 1900s.¹ Child labor laws often allowed children to leave school for work at age 14 by having exemptions for children who completed certain levels of schooling, which varied by state. While many states specified that children must complete 8th grade to be eligible for a labor permit, some states (such as Arizona, Missouri, and Vermont) required a lower level of schooling (Deffenbaugh and Keesecker [1935](#)).

State governments also enacted school continuation laws, which required working children who were still under the maximum school leaving age to attend school in their spare time. The required school time was short, usually only a few hours per week, but it increased the opportunity cost of hiring children under the maximum school leaving age since they might not always be excused from school (Goldin and Katz [2011](#)).

Laws on compulsory attendance, child labor, and school continuation combined generate large variations in length of school attendance across birth cohorts and states. This paper follows the procedures in Stephens and Yang [2014](#) and Clay et al. [2021](#), which calculate the number of cumulative years each child needed to be in school while taking age limits and exemptions into

¹A few states had enacted child labor laws before 1900, but they lacked enforcement, and there was an increase in child labor between 1880 and 1900 (Bliss [1905](#)). Between 1900 and 1910, however, more states established child labor laws and committees to enforce these laws, and the share of young children (13 years old and under) working declined below 5 percent by 1930 (Feigenbaum and Russo [2020](#)), although Moehling [1999](#) finds that minimum age limits had little effect in the decline of child labor in the long run.

consideration.² Using the data obtained from the replication package of Clay et al. 2021, I show the variations in length of schooling required for birth cohorts born between 1880 and 1910 in Figure 1. Later cohorts were required to be in school for longer, and children outside of the South were affected by these laws earlier than children in the South.

Using the 1940 complete-count census (Ruggles et al. 2021), I show the share of population affected by different lengths of compulsory schooling in Figure 2. The majority of the population was affected by laws requiring compulsory schooling of 6 years or longer. It was most common to be required to attend school for 8 years, and a small share of the population was required to attend school for 9 or 10 years.

2.2 Women's Education during the Late 19th and Early 20th Centuries

The American education system embraced the virtue of gender neutrality starting from the early 19th Century, offering to educate female and male students to similar levels for those under 15 years old (Goldin and Katz 2008). Publicly funded schools helped to achieve such a goal since parents of poorer households did not have to choose between educating their sons or daughters.

I show that women and men had similar educational attainment in Figure 3 using the sample of native-born white people aged 28 to 55 in the 1940 complete-count census (Ruggles et al. 2021).³ I restrict the sample to native-born white individuals because foreign-born individuals might not have completed schooling in the US and, as a result, might not be subjected to state-level schooling laws. In addition, since the US South was late in introducing state schooling laws and had weak enforcement of such laws (Margo 1990; Lleras-Muney 2002; Stephens and Yang 2014), I do not include Black women or Black men in the sample.⁴ It is thus important to note that the women and men studied in this paper are referring to native-born white individuals. Across every birth cohort, the share of women completing 8th and 12th grade is slightly higher than that of men. To lessen the concern that this pattern is driven by attrition (e.g., women lived longer and were more likely to survive until 1940), I show that the share of women completing 8th and 12th grade was also slightly higher than that of men in the 1915 Iowa state census where

²Many previous works have also discussed the variations in length of school attendance generated by state laws, see Moehling 1999; Lleras-Muney 2002; Goldin and Katz 2011; Clay et al. 2012b; Rauscher 2015.

³The 1940 census is the first complete-count census that has information about education.

⁴I also restrict the sample to people born between 1885 and 1912 because they were affected by changes in compulsory schooling laws and were young enough to be in the labor force.

the sample was much younger.

Despite similarity in educational attainment between women and men, there are substantial gender differences in schooling. Most women did not go to school with the goal of a lifelong career. Instead, they went to school to learn knowledge and morals to become good wives and mothers (Rury 1991). For the small share of women who attended school to pursue future employment, they often worked at the cost of marriage due to marriage bars that prevented married women from working and fired women after marriage (Goldin 1988; Goldin 2021), although they were able to financially support themselves without a husband (Harris 1978).

2.3 Education and Women's Labor Market Outcomes

Although education for women was not originally intended to prepare them for careers after leaving school, the skills taught to improve their performance as homemakers also enhanced their potential as workers. For example, courses in bookkeeping and accounting were offered to help women manage household finances more efficiently after marriage, but these skills also opened up opportunities for paid employment as bookkeepers. Similarly, many women took courses in typewriting and stenography, and they often worked as stenographers or secretaries briefly before marriage (Rury 1984).

This acquisition of transferable skills through education directly influenced women's employment prospects and returns to schooling. Educated women gained access to more skilled occupations that offered higher wages (Goldin and Katz 2008). The value of their education was further amplified by demand-side factors (Becker 1985); technological advancements, for example, created entirely new job categories like telephone operation, which became a major employer for American women early in the 20th century (Feigenbaum and Gross 2024). Finally, occupational segregation and discrimination might also have increased the value of education for women in the labor market. Education often prepared men for management and administrative positions, creating vacancies in lower-ranked jobs that women, in turn, were able to fill (Rury 1991).

This paper uses the 1940 complete-count census to study women's labor market outcomes. Outcome variables include whether a woman was gainfully employed, women's labor supply, the types of occupations women engaged in, and more.

2.4 Education and Women's Marriage Market Outcomes

Educators and domestic feminists during this period argued that education made women more efficient homemakers and knowledgeable mothers. In the marriage market, women with higher education could be considered more attractive partners through several channels. Schools often offered practical courses in sewing and cooking, enabling women to mend and alter clothing for their families and, in some cases, produce goods for sale to supplement household income (Rury 1991). Education also instilled moral values and emphasized character development, qualities considered essential for effective child-rearing. In other words, educated women made good mothers because raising children was seen as a sacred responsibility and women needed “all the intellectual and moral ballast” they could get (Nash 2005). Moreover, mothers were not only responsible for their own children but were also tasked with developing “both the skills and the character in future generations necessary for continued social and economic development” (Rury 1991). Finally, educated women could directly contribute to household income by participating in the labor market, which might be extremely useful if the husband was out of a job.

Past work provides consistent evidence with the historical account outlined above, although it primarily focuses on women from more recent generations. Benham 1974 shows women's education has positive effects on their husbands' earnings, likely through human capital sharing within marriage. Similarly, Lefgren and McIntyre 2006 finds that about half of the benefits of women's education arise from marrying higher-income husbands, and Kim and Sakamoto 2017 shows that more education for married women improved the family standard of living.

This paper uses the 1940 complete-count census to study women's marriage market outcomes, which provides information on women's marital status as well as age at first marriage (although only for sample-line women). Conditional on marriage formation, the census also has information on the husband's education and employment.

2.5 Heterogeneous Effects By Women's Socioeconomic Background

The effect of education might vary by women's socioeconomic background. For women from poorer households, an additional year of schooling might allow them to access better employment opportunities and be matched with better-quality husbands, generating larger returns.

To study the heterogeneous returns to education based on family socioeconomic background, I use the linked data for women from the Census Tree Project (Price et al. 2021; Buckles et al. 2023a). The Census Tree data relied on user-contributed links from FamilySearch.org, a genealogy platform where users find their ancestors using historical records. This approach overcomes a major challenge in historical data linkage—tracking women who often changed their names after marriage—and represents a substantial improvement in the ability to follow women longitudinally.

In this paper, I used the Census Tree linked data to follow women in the 1940 census back to their childhood censuses, either in 1900, 1910, or 1920 (Buckles et al. 2023b; Buckles et al. 2023c; Buckles et al. 2023d). The linked data provide information on the father’s occupation and occupational score, which are used as measures of socioeconomic background. Occupational score is a numerical score assigned to an occupation, and a higher occupational score indicates a higher socioeconomic background. I classify women as coming from a high socioeconomic background if their father’s occupational score is above the median, and from a low socioeconomic background if it is below the median.

3 Identification: Instrumental Variables

Since education is an endogenous choice, OLS estimates of years of schooling on the outcome variables are likely biased. For example, women of higher socioeconomic backgrounds might complete more years of schooling but are less likely to work after graduation, biasing the estimates downwards. As a result, I instrument years of schooling with laws on compulsory attendance, child labor, and continuation of school. The IV estimates help to establish the causal effect of education.

3.1 Compulsory Schooling Laws As Instruments

Almost 90% of women aged 28 to 55 in 1940 had been affected by compulsory schooling laws while they were young. As shown in Figure 2, among those who were required to attend school, the vast majority were required to attend school for at least six years and at most ten years, while very few were required to attend school for only one to five years.

Due to this non-linearity in the number of required years of attendance, I use a group of dummy variables (instead of a continuous variable) that indicate different lengths of compulsory attendance as instruments for years of schooling completed. In particular, the instruments consist of four dummy variables, which are equal to 1 if the required number of years of attendance is six, seven, eight, and nine years or above.

The positive effect of compulsory attendance on years of schooling completed is illustrated in [Figure 4](#) and [Table A1](#). The results show that requiring children to attend school for six, seven, eight, and nine years or above increased their probability of completing sixth, seventh, eighth, and ninth grade respectively, which suggests that compulsory attendance laws are effective in increasing years of education. Among these estimates, requiring children to attend school for nine years or above has the largest effect, which increased the probability of finishing the ninth grade by 4.1%, although it did not affect the probability of finishing high school.

3.2 Instrumental Variables Specification

The instrumental variables specification used to estimate the returns to education for women is the following:

$$Y_{icsr} = \beta_0 + \beta_1 Educ_{icsr} + \gamma_s + \gamma_{cr} + \epsilon_{icsr}$$

$$Educ_{icsr} = \alpha_0 + CA'_{icsr} \Omega + \theta_s + \theta_{cr} + u_{icsr}$$

Y_{icsr} is the outcome variable in the 1940 census (that measures labor market returns and marriage market returns) for individual i who was born in birth cohort c , state s , and region r , and $Educ_{icsr}$ is the years of schooling completed. CA_{icsr} is a vector of instruments consisting of four dummy variables, which are equal to 1 if the required number of years of attendance is six, seven, eight, and nine years or above. The specification also includes birth state fixed effects γ_s and birth year by birth region fixed effects γ_{cr} . With both fixed effects, β_1 captures changes within the state over time and variations across states but within the same region and birth cohort. This is similar to the specification used by Stephens and Yang [2014](#) and Clay et al. [2021](#).

3.3 First Stage Results

[Table 1](#) presents the first stage estimates of the instruments on years of schooling completed for several groups of women. Column 1 includes all native-born White women born between 1885 and 1912. The results first show that women required to attend school for six years did not experience a large positive effect on years of education relative to women who were not required to attend school and women who were required to attend school for one to five years.⁵ On the other hand, requiring women to attend school for seven, eight, and nine years or above increases women's educational attainment by 0.069, 0.078, and 0.153 years, respectively. A higher number of required years of attendance seems to be more effective at increasing educational attainment among women. The joint F-statistics in Column 1 is around 16.

The magnitudes of all these estimates in Column 1 are slightly smaller than those of men (shown in Stephens and Yang [2014](#) and Clay et al. [2021](#)), indicating that the laws might have a weaker effect on increasing women's education. This could be because women's labor during their teenage years was valued less than men's labor in the industry, and women were more likely to attend school than men in the first place.

In addition, I further restrict the sample to currently married women in 1940, working women who earned positive wages in 1940, sample-line women in the 1940 census (which is less than 5 percent of the female population), and women born outside the south in Columns 2, 3, 4, and 5. Using various samples allows me to examine the returns to education among different groups.

The first-stage results from Columns 2, 3, 4, and 5 are similar to those of Column 1, suggesting that compulsory attendance laws have a positive effect on years of schooling for married women, working women, sample-line women, and women born outside the South as well. Note that the results for working women in Column 3 are slightly different because the coefficients do not increase monotonically with the increasing number of required years of attendance, which could be due to the selection of women who were earning positive wages (which consists of less than 25% of the female population in the analysis). In addition, the joint F-statistics among sample-line women is smaller than 10, suggesting that the instruments are weak in this case, which could be due to the much smaller sample size of sample-line women.

⁵The results are similar if we include compulsory attendance for one to five years as an instrument in the first stage. See more details in [Table A2](#).

3.4 First Stage Results By Socioeconomic Background

It is important to study whether children from lower socioeconomic backgrounds benefited more from compulsory attendance laws relative to other children. As a result, I additionally examine the effect of compulsory attendance laws on years of education by household socioeconomic background using the linked Census Tree sample of women. The household socioeconomic background is measured by (1) the father's occupational score (a higher score indicates a higher occupational status) or (2) the father's occupation category, which can be skilled (such as managers, carpenters, and motormen), and others (such as guards and farm laborers).

Since the linked sample of women likely differs from the complete-count sample of women,⁶ we might be concerned that the selection into the linked sample of women could bias the results. To address this issue, I show that the first stage results from the linked sample of women are similar to those of the complete-count sample of women aged 28 to 55 in 1940 (see the comparison between Columns 1 of [Table 2](#) and [Table 1](#)). This indicates that compulsory attendance laws positively affected education attainment for women in the linked sample, which is reassuring.

Columns 2 to 5 of [Table 2](#) show that compulsory attendance laws affected children from high and low socioeconomic backgrounds differently. For children of high socioeconomic backgrounds, compulsory attendance laws that required students to attend school for 6, 7, 8, and 9 years or above increased their education. However, for children of low socioeconomic backgrounds, only compulsory attendance laws that required students to attend school for nine years or above increased their education. Further analysis of children from different households by farm/urban status suggests compulsory attendance laws were less effective in increasing education among children from farm households relative to non-farm households, but they were similarly effective in increasing education attainment of children from rural and urban households (see Columns 6 to 9 of [Table 2](#)). The combined results suggest requiring children to attend school for fewer than nine years had little effect on the education attainment of children from lower socioeconomic backgrounds, especially children from households that engaged in manual labor (e.g. farming).

The lack of benefits of some compulsory attendance laws for children from lower socioeconomic backgrounds is surprising since conventional wisdom might suggest that compulsory at-

⁶For example, [Table A3](#) suggests women in the linked sample were more likely to have been married/be in farming households in 1940.

tendance laws would make educational resources more equal between children of different class backgrounds.⁷ One reason behind this result could be that states have different enforcement of compulsory attendance laws and stronger enforcement is positively correlated with more years of compulsory attendance. According to Deffenbaugh and Keesecker 1935, there are ten different types of provisions a state can impose to enforce the compulsory attendance laws (see more details in Figure A1). The data suggest the Midwest region had the highest average number of provisions regarding enforcement (Figure A2), and the Midwest also had more states enacting laws requiring children to attend school to nine years or above.⁸ That said, it is difficult to examine the effect of enforcement of compulsory attendance on years of education accomplished since the data on enforcement were only available in 1935, and many states strengthened their laws between 1915 and 1935 (Schmidt 1996).

4 Returns to Education on Women's Labor Market Outcomes

4.1 Positive Returns on Gainful Employment and Occupational Status

In this section, I present evidence on the positive effect of education on women's gainful employment and occupational status. While past literature on returns to schooling mostly focuses on the effect on earnings when studying men, I argue that studying the effect on the probability of gainful employment and labor supply is more important for women because women's labor supply was much more elastic (Goldin 2006).

The first outcome variable of interest is gainful employment, which is defined as having a gainful occupation that does not include working as a housewife, helping with chores at home, or being a student.⁹ I prefer using gainful employment as the outcome variable because it captures women's work more comprehensively, which was often part-time and temporary.¹⁰

⁷Rauscher 2016 finds compulsory attendance laws improved inequality in school attendance among white male children using data from 1850 to 1920.

⁸Illinois, Indiana, Ohio, and Nebraska required some birth cohorts to attend school for nine years or above. The other states with similar laws were New Mexico, Utah, Wyoming, and New Jersey.

⁹"Gainful occupation" is not a formally defined term, but census enumerators were instructed to mark down a gainful occupation if the occupation is income-generating. For example, a housekeeper is not considered a gainful occupation if the woman works in her home as the housekeeper but is considered a gainful occupation if the woman works for other households and gets paid for the housework done. See more details here: <https://www.census.gov/library/publications/1929/dec/monograph-9.html>

¹⁰Gainful employment is different from the "employment" variable recorded by the census enumerator since being employed requires the person to work for pay in the specific reference period. In the 1940 census, a person is

The effect of compulsory attendance on women's gainful employment is shown in Column 1 of [Table 3](#). The OLS estimate suggests that an additional year of schooling increases women's probability of having a gainful occupation by 2.2 pp. On the other hand, the IV estimate suggests a much larger 7.9 pp. effect. The OLS estimate might be biased downward if women from higher socioeconomic backgrounds obtained more years of education but were less likely to work outside the household. The IV estimate suggests that an additional year of schooling increases women's employment substantially, given that only 25 percent of women had a gainful occupation in 1940.

In addition, an additional year of schooling also increases women's labor supply, as suggested by positive OLS and IV estimates. In particular, the IV estimates suggest an additional year of schooling increases weeks worked per year by 3.4 weeks and hours worked per week by 2.3 hours. The increase in labor supply is sizeable, considering that most women in the sample were not working and the average labor supply was 11 weeks per year and 9 hours per week.

Conditional on the sample of working women who earned positive wages in 1940, I show that an additional year of schooling substantially increased women's earnings. The OLS and IV estimates suggest an additional year of schooling increases wage earnings by 11.2 to 16.9 percent. One reason behind the large returns on wage earnings might be that education allowed women to enter higher-paying and skilled occupations, such as clerical workers or bookkeepers. To test this hypothesis, I examine some additional outcome variables that are dummy variables equal to one if the woman was a stenographer, a clerical worker, a bookkeeper, or a housekeeper. The first three occupations were higher-paying occupations, while the last was not. Columns 5 to 8 of [Table 2](#) show that an additional year of schooling increases the probability of being a stenographer/clerical worker/bookkeeper by 1.2 to 3.3 pp. while it decreases the probability of being a housekeeper by 1.9 pp. Although the improvement in women's occupational status might not fully account for the 16.9 percent increase in women's earnings because women earning positive wage earnings in 1940 were highly selected, it provides supportive evidence that women with more education were more likely to enter higher-paying occupations and receive larger returns to education in the labor market.¹¹

considered "employed" if she worked at least 1 hour for pay from March 24 to March 30 in 1940.

¹¹Note that the results from [Table 3](#) are the average effect among native-born White women aged 28 to 55 in 1940, and the identification strategy cannot separate the effect of education on earnings over the life cycle. We might expect education not only benefit women immediately after graduation but also benefit women when they have the option to rejoin the labor force when they are older and after the children leave the households (Bailey 2006,

Finally, I show that the results among non-southern-born women are similar to those shown in [Table 3](#). The similarity between the two groups of results rules out that Southern-born White women were driving the results because the laws were adopted later during the South and the birth cohorts affected in the South were the youngest group in 1940. More details are illustrated in [Table A3](#).

4.2 Heterogeneous Returns By Socioeconomic Background

Examining the heterogeneous returns by children's socioeconomic backgrounds shows that children from lower socioeconomic backgrounds benefited more from increasing years of education. As shown in Panels A and B of [Table 4](#), an additional year of education increased the probability of gainful employment by 4 pp. for children whose father's occupational score was above the median level while it increased the probability of gainful employment by 8.2 pp. for children whose father's occupational score was below the median level. The differences become larger when we consider the differences in employment: 24.5% of children from higher socioeconomic backgrounds were gainfully employed in 1940, while only 16.3% of children from lower socioeconomic backgrounds were doing the same. This means children from a lower class experienced roughly a 50% increase in employment with an additional year of schooling. The results for other labor market outcomes (such as labor supply and occupational score) are similar, although some of the differences in IV estimates between the two groups are not statistically significant.

Perhaps surprisingly, the large difference in the increase in gainful employment does not translate into a large difference in wage earnings between children from lower and higher socioeconomic backgrounds – column 5 of [Table 4](#) suggests the increase in wage earnings is 20% versus 18% increase for these two groups respectively. This implies that although more women from lower socioeconomic backgrounds joined the labor force thanks to an increasing level of education, those earning positive wages experienced limited wage growth relative to women from higher socioeconomic backgrounds.

In addition, I show that the heterogeneous returns based on the farm status of the childhood households are similar to the results based on socioeconomic backgrounds. Children from farm

Goldin, Kerr, et al. [2022](#)). The effects over the life cycle are more difficult to examine due to the lack of panel data during this period.

households experienced a larger increase in gainful employment relative to children from non-farm households, but they did not experience a larger increase in wage earnings because of an increasing level of education.

Finally, Panels E and F of [Table 4](#) show that children from rural areas benefited more from increasing levels of schooling. In particular, an additional year of education increased their probability of employment by 7.8 pp. (46%). It also increased their labor supply by 3.2 weeks worked per year and 2.6 hours worked per week (40%) and their occupational score by 2.0 (56%). In contrast, these labor market outcomes of children from urban areas were largely unaffected by increasing levels of schooling. The differences might be explained by the fact that more women in urban areas accomplished a high level of education and were more likely to be gainfully employed.

5 Returns to Education on Marriage Market Outcomes

The returns to education for women are not limited to their labor market outcomes since most married women did not work due to marriage bars and gender norms that prevented women from working outside the home (Goldin [1988](#); Goldin [1990](#); Goldin [2021](#)). As a result, I additionally examine the returns to education for women regarding their marriage market outcomes, which include their decision to marry as well as the match quality (conditional on marriage formation).¹²

5.1 Marriage Formation and Dissolution

Given the positive returns to education in the labor market, we might expect the effect of an additional year of education on the probability of marriage to be negative because some women would give up marriage to pursue a career. ¹³ The OLS estimate of years of education on the probability of never marrying in Column 1 in [Table 5](#) is 1.36, confirming the positive correlation between the two variables. However, the IV estimate is -0.41, suggesting an additional year of

¹²Ideally, the returns to women's education on women's productivity in home production and quality of child-rearing should also be examined, but data on these outcomes are scarce.

¹³Lafortune et al. [2022](#) suggests that the most educated women were the least likely to marry among those born before 1960. In addition, Olivetti et al. [2022](#) shows similar evidence that women of the highest socioeconomic background are also least likely ever to get married.

education led to a 0.41 pp. decrease, instead of an increase, in the probability of never marrying. The IV estimate is also pretty small given that an average share of 12.45 percent of women aged 28 to 55 were never married in 1940. Importantly, the IV estimate is not statistically significant, and we cannot reject the hypothesis that education had no causal effect on marriage formation. Though initially surprising, the null result is consistent with the historical account that most women attended school to become efficient housekeepers and knowledgeable mothers after marriage, and most women eventually married despite their high educational status.

Conditional on marriage formation, there is positive evidence of assortative matching. Column 4 of [Table 5](#) shows that an additional year of the wife's education is associated with 0.71 to 0.93 additional years of the husband's education. This is consistent with findings from past research on assortative mating during the historical United States (Goldin [2004](#); Bailey, Guldi, et al. [2014](#)).

On the other hand, education might positively affect women's bargaining power within the household and allow women to exit marriage more easily. Column 2 of [Table 5](#) supports this argument. Although only 2.5 percent of women in the 1940 sample got divorced or separated, the OLS and IV estimates suggest that an additional year of education increased the probability of divorce or separation by 0.06 and 1.43 pp., respectively. This is likely because women with more education could support themselves financially, and they were more likely to get a divorce or separation thanks to financial independence.

In addition, I examine whether education delayed women's age at first marriage, given that education might make women stay in school longer. Column 3 of [Table 5](#) shows that an additional year of education increased age at first marriage by 0.38 to 0.75 years, where the IV estimate is larger than the OLS estimate. This is consistent with the evidence from the post-WWII United States (Lennon [2022](#)) and the mid-20th Century United Kingdom (Powdthavee and Adireksombat [2010](#)). Note that the question regarding age at first marriage was only asked for sample-line women who were less than 5 percent of the female population. The results here should be interpreted cautiously, given the much weaker first-stage results due to the smaller sample size (see [Table 1](#)).

Finally, I show that the results among non-southern-born women are similar (see more details in [Table A6](#)). This addresses the concern that Southern-born White women could bias the results

because the laws were adopted later in the South, and the birth cohorts affected in the South were the youngest group in 1940.

5.1.1 Heterogeneous Effects By Socioeconomic Background

The comparison of women from lower versus higher socioeconomic backgrounds reveals an interesting result: women from lower socioeconomic backgrounds were more likely to be never married in 1940 with more years of education (see Column 1 of [Table 6](#)). Although the negative coefficients do not imply that these women remained never married forever, they indicate that an additional year of education might allow women from lower socioeconomic backgrounds to search for a good marital match for longer. In addition, a higher level of education allowed women to work in the labor market, which also made remaining single for a longer time period possible for women from lower socioeconomic backgrounds.

5.2 Match Quality Among Married Couples

Women with more education might be able to find a better match in the marriage market. As a result, I examine the effect of education on match quality by examining these women's husbands' labor market outcomes. For example, if the wife's education negatively affects the husband's probability of unemployment, this indicates that more education allows the woman to find a better match in the marriage market.

Since women and men were affected by compulsory attendance during the same period, it is difficult to separate the effect of the wife's education on match quality from the effect of the husband's education. To alleviate this issue, I control for the husband's years of education in the specification. Without claiming causality, this allows me to examine whether the wife's education (independent of the husband's education to some extent) plays a role in match quality.¹⁴

The match quality is measured by the husband's labor market outcomes. The first outcome variable of interest is whether the husband was unemployed in 1940, which includes people who were employed on public emergency projects thanks to the New Deal.¹⁵ Unemployment

¹⁴Causality is difficult to establish because marriage is an endogenous choice and the sample of married couples is selected. In addition, the husband's education is also endogenous.

¹⁵Public emergency work projects were developed to move workers from unemployment to relief work. As a result, being employed on public emergency projects indicates that the person had been unemployed in previous years.

was common during this period due to the aftermath of the Great Depression, and the lack of unemployment indicates a better match quality. The OLS estimate in Column 1 of [Table 7](#) shows that higher levels of education of the wife and the husband were both associated with a lower level of unemployment for the husband by 0.87 to 0.93 pp. The IV estimate, on the other hand, shows that an additional year of the wife's education reduced the probability of the husband being unemployed by 3.16 pp., which is a large effect given that only 13% of husbands in the sample were unemployed. The results suggest a high level of education attained by the wife might allow her to get a better match in the marriage market.

In addition, I also show that an additional year of education attained by the wife increased the husband's wage earnings by 8.5 pp., despite that the wife's education did not improve the husband's occupational status or increase the husband's labor supply. This could be because a more educated wife increased the husband's productivity on the job, or it could be that a more educated woman was more likely to be matched with a more productive husband. On the other hand, there is little evidence that the wife's education affected the husband's non-wage earnings.

5.2.1 Heterogeneous Effects By Socioeconomic Background

The results on match quality by socioeconomic background are shown in [Table 8](#). Based on Column 1, an additional year of the wife's education reduced the probability of the husband being unemployed in 1940 by 4.9 pp. among those from lower socioeconomic backgrounds. This is much larger than the 0.4 pp. decrease for those from higher socioeconomic backgrounds. In addition, Column 6 suggests that an additional year of the wife's education also reduced their husband's probability of earning non-wage earnings above fifty dollars (an indication of self-employment) for those from lower socioeconomic backgrounds. The combined results indicate that women from lower socioeconomic backgrounds might have benefited more from education on match quality in the marriage market.

6 Conclusion

Although women and men had similar levels of educational attainment during the historical United States, the returns to education for women are not well documented. This paper fills the gap in the literature by estimating the effect of women's education on their labor market and

marriage market outcomes using compulsory schooling laws as instrumental variables.

I show that additional years of education increased the probability of women's employment significantly, generating large returns to education for women in the labor market. On the other hand, there is little evidence that more education caused women not to be married, but it did increase women's probability of divorce. Conditional on marriage formation, I find that women's education had a positive effect on the husband's labor market outcomes. In both the labor market and marriage market, women from lower socioeconomic backgrounds benefited more from education.

Future research on the returns to education for women should focus on examining the mechanisms behind these results, which is difficult to accomplish given the data limitations. For example, do women with higher levels of educational attainment improve their husbands' productivity, which in turn leads to a positive effect on the husbands' labor market outcomes? Examining the mechanisms behind the large returns to education for women is important to understanding women's role in the labor market as well as the marriage market.

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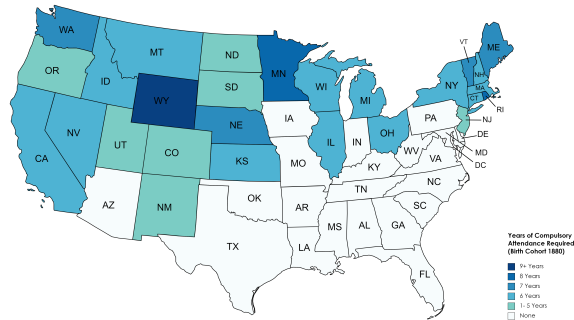
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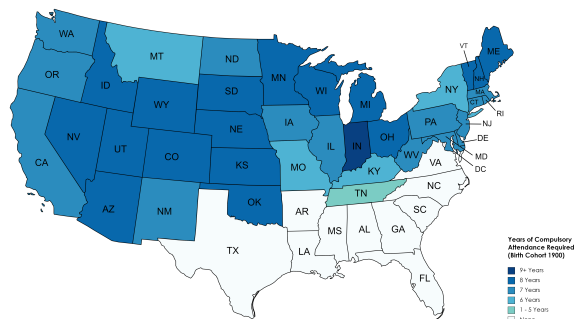
7 Figures

Figure 1: States with Different Lengths of Compulsory Attendance

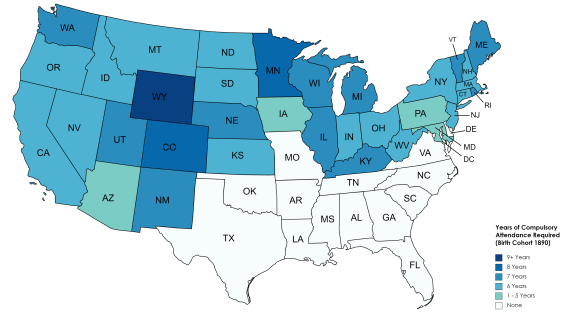
(a) Birth Cohort 1880



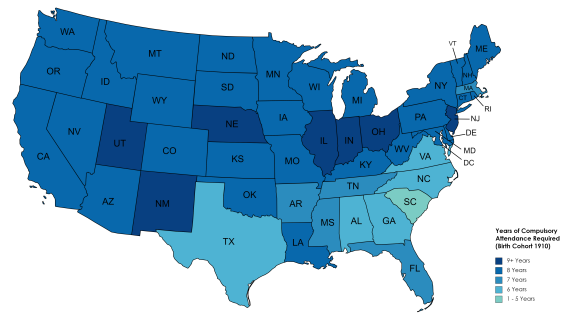
(c) Birth Cohort 1900



(b) Birth Cohort 1890

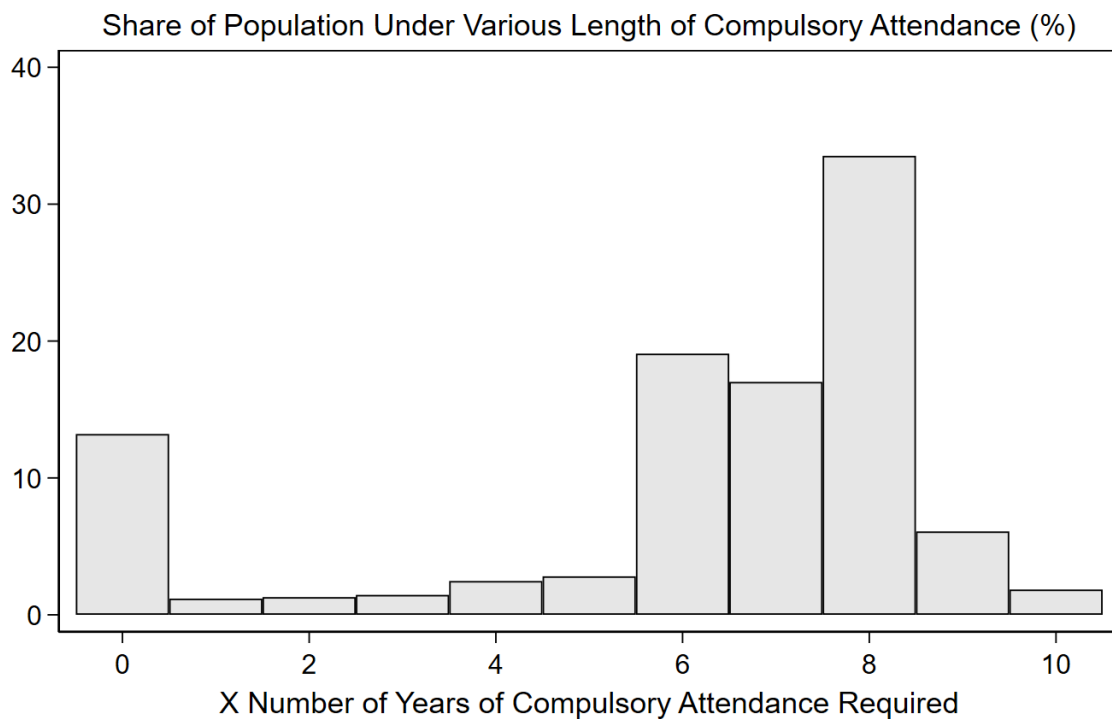


(d) Birth Cohort 1910



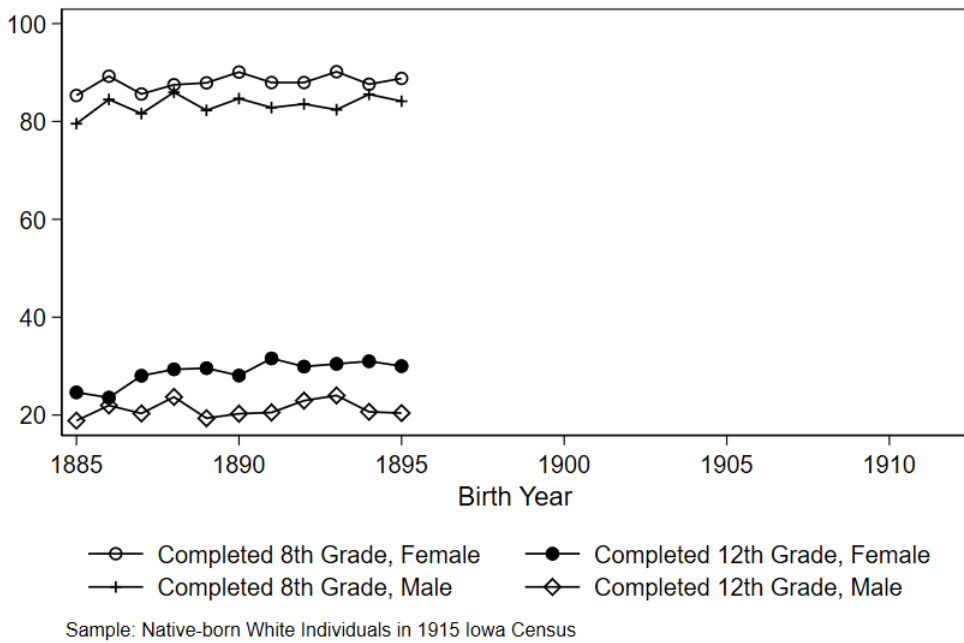
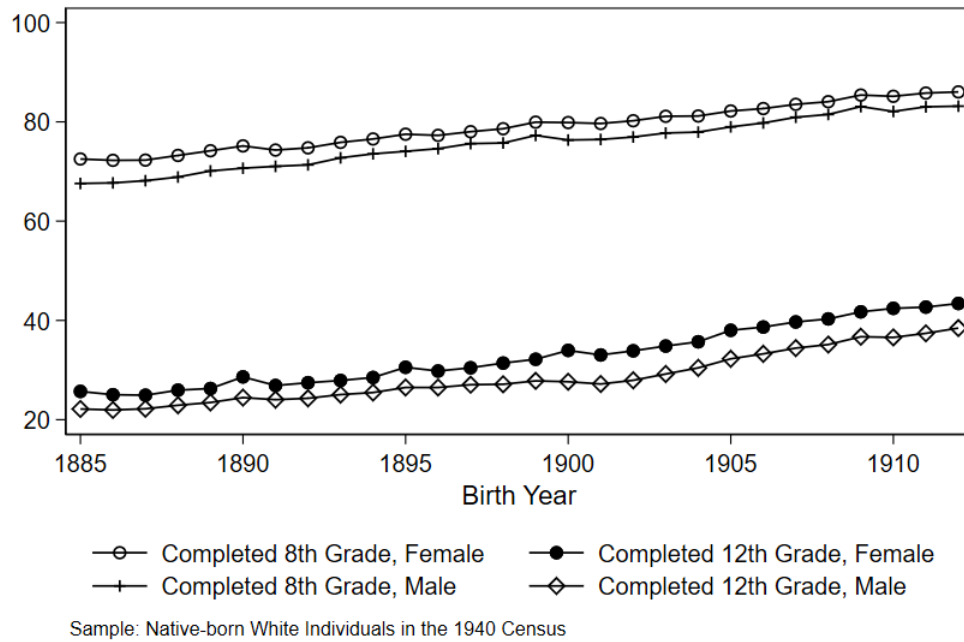
The figure illustrates the lengths of compulsory attendance for birth cohorts 1880, 1890, 1900, and 1910 in different states. Lengths of compulsory attendance are categorized into (1) None; (2) 1-5 years; (3) 6 years; (4) 7 years; (5) 8 years; (6) 9 years and above.

Figure 2: Share of Population Under Various Lengths of Compulsory Attendance (%)



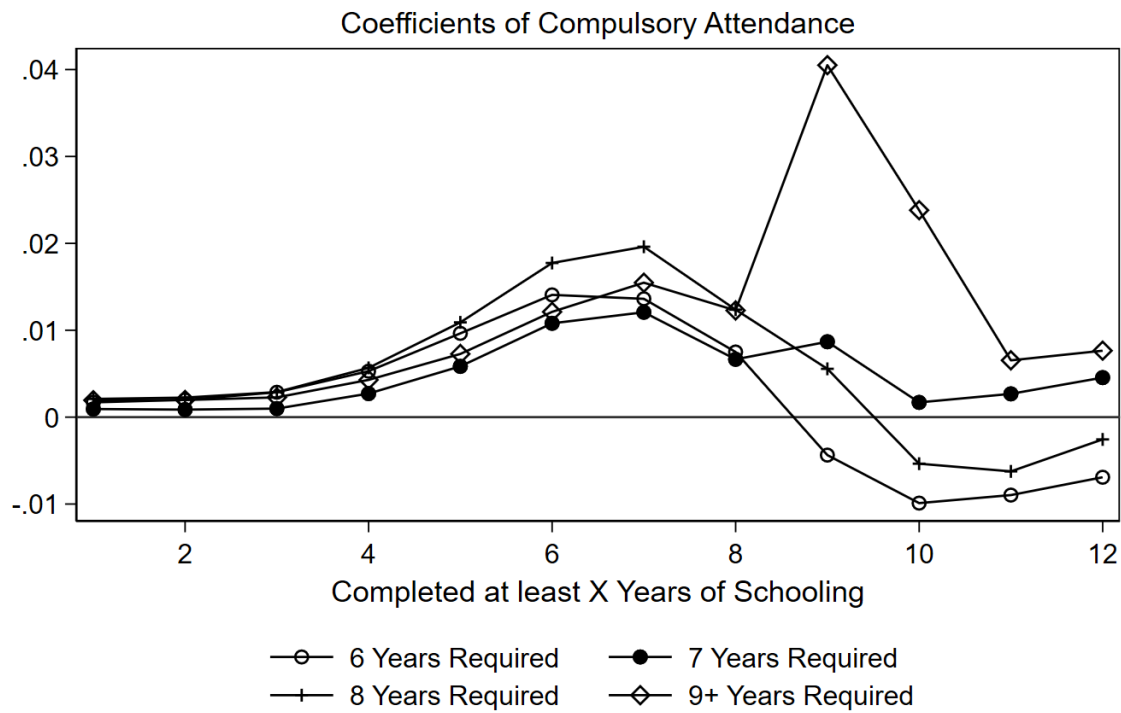
The figure shows the share of the population that was under various lengths of compulsory attendance laws in 1940. The sample is restricted to white and native-born women who were born between 1885 and 1912.

Figure 3: Share of Population that Completed 8th and 12th Grade by Gender (%)



The figure at the top shows the share of the population completed 8th and 12th grade as reported in the 1940 Decennial Census. The sample is restricted to white and native-born people who were born between 1885 and 1912. The figure at the bottom shows the share of the population completed 8th and 12th grade as reported in the 1915 Iowa State Census. The sample is restricted to white and native-born people who were at least 20 years old when the 1915 Iowa State Census was taken.

Figure 4: The Effect of Compulsory Attendance Laws on Years of Schooling Completed



The figure plots the coefficients of dummy variables that indicate different lengths of compulsory attendance laws from separate regressions. Each regression has a different outcome variable that indicates whether one completed at least X years of schooling, where X ranges from 1 to 12. Detailed results from the regressions are shown in [Table A1](#). The sample is restricted to white and native-born women who were born between 1885 and 1912 ($N=18836237$).

8 Tables

Table 1: First Stage - The Effect of Compulsory Attendance on Years of Schooling Completed

	(1) All Women	(2) Married Women	(3) Working Women	(4) Sample-line Women	(5) No South
<i>Required Years of Schooling</i>					
6 Years	0.018 (0.013)	0.010 (0.013)	0.111*** (0.018)	0.030 (0.020)	0.009 (0.015)
7 Years	0.069*** (0.015)	0.060*** (0.016)	0.193*** (0.022)	0.081*** (0.023)	0.060*** (0.017)
8 Years	0.078*** (0.017)	0.067*** (0.018)	0.206*** (0.023)	0.096*** (0.025)	0.063*** (0.018)
9 Years +	0.153*** (0.023)	0.154*** (0.024)	0.184*** (0.028)	0.168*** (0.032)	0.138*** (0.023)
N	18836237	14902197	4151245	936920	14784416
F Stats	15.983	15.541	24.121	8.392	15.283

The outcome variable is years of education completed reported in the 1940 census. The independent variables are dummy variables indicating years of required compulsory attendance. The regression includes birth state fixed effects and birth year by region fixed effects. The sample from Column 1 is White, native-born women who were born between 1885 and 1912. Columns 2, 3, 4, and 5 further restrict the sample to currently married women in 1940, working women who earned positive wages in 1940, sample-line women in the 1940 census, and women born outside of the South. First-Stage F Stats are reported.

Table 2: First Stage By Socioeconomic Background - The Effect of Compulsory Attendance on Years of Schooling Completed

	(1) All	(2) > Median OccScore	(3) <= Median OccScore	(4) Skilled Occ.	(5) Other Occ.
<i>Required Years of Schooling</i>					
6 Years	0.030* (0.014)	0.035* (0.016)	-0.003 (0.016)	-0.005 (0.015)	0.009 (0.016)
7 Years	0.079*** (0.016)	0.108*** (0.019)	0.014 (0.019)	0.092*** (0.018)	0.011 (0.019)
8 Years	0.099*** (0.017)	0.121*** (0.020)	0.032 (0.021)	0.097*** (0.020)	0.028 (0.021)
9 Years +	0.220*** (0.023)	0.229*** (0.027)	0.236*** (0.031)	0.220*** (0.027)	0.169*** (0.030)
N	6159887	2946448	3213439	2142574	3444008
F Stats	24.535	20.447	23.198	23.956	11.599
		(6) Non- Farm	(7) Farm	(8) Rural	(9) Urban
6 Years		0.040* (0.016)	-0.019 (0.018)	0.030* (0.015)	-0.032 (0.019)
7 Years		0.105*** (0.019)	0.004 (0.021)	0.045* (0.018)	0.071** (0.023)
8 Years		0.127*** (0.020)	0.010 (0.024)	0.069*** (0.021)	0.076** (0.024)
9 Years +		0.243*** (0.026)	0.221*** (0.033)	0.248*** (0.030)	0.156*** (0.031)
N		3274783	2885104	4311929	1847958
F Stats		23.750	25.712	21.047	14.205

The outcome variable is years of education completed reported in the 1940 census. The independent variables are dummy variables indicating years of required compulsory attendance. The regression includes birth state fixed effects and birth year by region fixed effects. The sample from Column 1 is the linked sample of White native-born women who were born between 1885 and 1912. Columns 2 and 3 select the sample of women based on their father's occupational scores (above and below median), Columns 4 and 5 select the sample of women based on the category of their father's occupations (skilled and others), and Columns 6 to 9 select the sample of women based on farm and urban status of their fathers.

Table 3: The Returns to Education on Labor Market Outcomes

	(1) Gainful Occupation		(2) Weeks Worked		(3) Hours Worked		(4) ln Wage	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Educ	2.190*** (0.019)	7.129*** (1.862)	0.907*** (0.009)	3.399*** (0.829)	0.752*** (0.006)	2.289*** (0.614)	0.112*** (0.001)	0.169*** (0.023)
\bar{Y}	25.871	25.871	11.114	11.114	9.219	9.219	6.391	6.391
	(5) Steno- graphers		(6) Clerical Workers		(7) Book- keepers		(8) House- keepers	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Educ	0.515*** (0.011)	3.342*** (0.724)	0.238*** (0.003)	1.777*** (0.438)	0.213*** (0.002)	1.214*** (0.225)	-0.282*** (0.003)	-1.899*** (0.391)
\bar{Y}	2.482	2.482	1.748	1.748	1.284	1.284	2.012	2.012

The outcome variables are whether one had a gainful occupation in 1940 (*100), weeks worked in 1939, weekly hours worked in 1940, the natural log of wages reported in 1940, and whether the woman was a stenographer, a clerical worker, a bookkeeper, or a housekeeper (*100). The independent variable is the number of years of education completed. Both OLS and IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample is White, native-born women who were born between 1885 and 1912 (N=18836237). Column 4 further restricts the sample to working women who earned positive wages (N=4151245).

Table 4: The Returns to Education on Labor Market Outcomes By Socioeconomic Background

	(1) Gainful Occ.	(2) Weeks Worked	(3) Hours Worked	(4) OccScore	(5) ln(Wage)	(6) Steno- grapher	(7) House- keeper
<i>Panel A: Father's OCCSCORE > Median</i>							
Educ	3.991* (1.771)	2.131* (0.832)	1.611* (0.653)	1.174** (0.425)	0.179*** (0.045)	2.766*** (0.725)	-0.589** (0.212)
\bar{Y}	24.460	10.350	8.363	5.676	6.512	3.252	0.903
<i>Panel B: Father's OCCSCORE ≤ Median</i>							
Educ	8.167*** (1.432)	3.293*** (0.589)	2.477*** (0.463)	2.107*** (0.351)	0.201*** (0.052)	2.041*** (0.451)	-0.558** (0.209)
\bar{Y}	16.338	7.792	6.228	3.490	6.138	0.992	1.145
<i>Panel C: Children from Farm Households</i>							
Educ	7.635*** (1.238)	2.921*** (0.507)	2.094*** (0.412)	1.909*** (0.305)	0.184** (0.063)	1.133*** (0.236)	-0.511* (0.225)
\bar{Y}	15.178	7.477	5.972	3.171	6.037	0.649	1.146
<i>Panel D: Children from Non-farm Households</i>							
Educ	4.400** (1.695)	2.124** (0.781)	1.832** (0.619)	1.312** (0.407)	0.219*** (0.042)	2.797*** (0.696)	-0.520** (0.200)
\bar{Y}	24.065	10.202	8.236	5.573	6.502	3.153	0.931
<i>Panel E: Children from Rural Areas</i>							
Educ	7.830*** (1.312)	3.232*** (0.545)	2.601*** (0.439)	2.017*** (0.319)	0.217*** (0.042)	1.592*** (0.390)	-0.584** (0.217)
\bar{Y}	17.027	7.911	6.362	3.666	6.130	0.959	1.183
<i>Panel F: Children from Urban Areas</i>							
Educ	1.677 (1.671)	1.104 (0.773)	0.527 (0.623)	0.605 (0.405)	0.165** (0.056)	3.948*** (0.881)	-0.333 (0.228)
\bar{Y}	26.200	11.019	8.878	6.155	6.601	4.013	0.778

The outcome variables are whether one had a gainful occupation in 1940 (*100), weeks worked in 1939, weekly hours worked in 1940, the natural log of wages reported in 1940, and whether the woman was a stenographer, a clerical worker, a bookkeeper, or a housekeeper (*100). The independent variable is the number of years of education completed. Only IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample in Panel A and B consists of women aged 28 to 55 in 1940 whose fathers had OCCSCORE above and below the median level (N=2946448 and N=3213439). The sample in Panel C and D consists of women aged 28 to 55 in 1940 who were from farm and non-farm households when they were children (N=2885104 and N=3274783). The sample in Panel E and F consists of women aged 28 to 55 in 1940 who were from rural and urban areas when they were children (N=4311929 and N=1847958). The table also shows the mean of the outcome variables \bar{Y} in each category.

Table 5: The Returns to Education on Marriage Market Outcomes

	(1) Never Married		(2) Divorced/ Separated		(3) Age at First Marriage		(4) H's Educ	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Educ	1.361*** (0.017)	-0.410 (0.851)	0.063*** (0.003)	1.430*** (0.317)	0.382*** (0.003)	0.746** (0.272)	0.708*** (0.001)	0.925*** (0.059)
\bar{Y}	12.455	12.455	2.492	2.492	21.616	21.616	9.085	9.085

The outcome variables are whether one had never been married (*100), whether one had been divorced or separated (*100), age at first marriage, and the husband's years of education. The independent variable is the number of years of education completed. Both OLS and IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample is White, native-born women who were born between 1885 and 1912 (N=18836237). Column 3 further restricts the sample to sample-line women (N=710094) since information for age at first marriage is only available for this group. Column 4 further restricts the sample to White, native-born women who were married and with their husband present in the household in 1940 (N=12583226).

Table 6: The Returns to Education on Marriage Outcomes By Socioeconomic Background

	(1) Never Married	(2) Divorced/ Separated	(3) Age at First Marriage	(4) Husband's Education
<i>Panel A: Father's OCCSCORE > Median</i>				
Educ	-0.722 (1.557)	0.531 (0.294)	0.975** (0.338)	0.761*** (0.060)
\bar{Y}	12.971	1.748	21.570	9.790
<i>Panel B: Father's OCCSCORE ≤ Median</i>				
Educ	2.986** (0.922)	0.566** (0.202)	0.741* (0.326)	0.836*** (0.053)
\bar{Y}	7.529	1.147	21.056	8.393
<i>Panel C: Children from Farm Households</i>				
Educ	2.870*** (0.777)	0.221 (0.172)	0.514 (0.342)	0.781*** (0.049)
\bar{Y}	6.807	1.029	21.020	8.176
<i>Panel D: Children from Non-farm Households</i>				
Educ	-0.443 (1.465)	0.697* (0.271)	0.912** (0.331)	0.776*** (0.055)
\bar{Y}	12.679	1.734	21.550	9.740
<i>Panel E: Children from Rural Areas</i>				
Educ	2.013** (0.731)	0.527** (0.180)	0.615 (0.316)	0.814*** (0.047)
\bar{Y}	7.353	1.203	21.035	8.475
<i>Panel F: Children from Urban Areas</i>				
Educ	-0.556 (1.676)	0.494 (0.328)	1.118** (0.386)	0.673*** (0.079)
\bar{Y}	14.919	1.870	21.949	10.197

The outcome variables are whether one had never been married (*100), whether one had been divorced or separated (*100), age at first marriage, and the husband's years of education. The independent variable is the number of years of education completed. Only IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample in Panel A and B consists of women aged 28 to 55 in 1940 whose fathers had OCCSCORE above and below the median level (N=2946448 and N=3213439). The sample in Panel C and D consists of women aged 28 to 55 in 1940 who were from farm and non-farm households when they were children (N=2885104 and N=3274783). The sample in Panel E and F consists of women aged 28 to 55 in 1940 who were from rural and urban areas when they were children (N=4311929 and N=1847958). The table also shows the mean of the outcome variables \bar{Y} in each category.

Table 7: The Returns to Education on Match Quality - Married Women Only

	(1) H's Unemployed		(2) H's OccScore		(3) H's Weeks Worked	
	OLS	IV	OLS	IV	OLS	IV
Educ	-0.935*** (0.010)	-3.163** (1.188)	0.396*** (0.004)	0.412 (0.489)	0.381*** (0.005)	0.419 (0.560)
H's Educ	-0.874*** (0.009)	0.367 (0.662)	1.132*** (0.005)	1.124*** (0.272)	0.478*** (0.005)	0.456 (0.313)
\bar{Y}	12.959	12.959	25.700	25.700	43.096	43.096
	(4) H's Hours Worked		(5) H's ln(Wage)		(6) H's Nonwage Earnings > \$50	
	OLS	IV	OLS	IV	OLS	IV
Educ	0.577*** (0.006)	0.481 (0.761)	0.052*** (0.001)	0.085* (0.040)	0.891*** (0.018)	2.633 (1.938)
H's Educ	0.367*** (0.007)	0.421 (0.426)	0.077*** (0.000)	0.059** (0.022)	-0.102*** (0.026)	-1.072 (1.081)
\bar{Y}	38.001	38.001	7.029	7.029	37.171	37.171

The outcome variables are whether the husband was unemployed or employed on public emergency work projects in 1940 (*100), the husband's occupational score, the husband's weeks worked in 1939, the husband's hours worked per week, the husband's natural log of wage earnings, and whether the husband earned more than \$50 in nonwage earnings in 1940. Both OLS and IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The independent variables are the number of years of education completed by the wife (instrumented in the IV regressions) and the number of years completed by the husband. The sample is White, native-born women who were married and with her husband present in the household in 1940 (N=12583226). Columns 5 further restricts the sample to households where the husband was earning positive wages in 1940 (N=8653408). The table also shows the mean of the outcome variables \bar{Y} in each category.

Table 8: The Returns to Education on Match Quality By Socioeconomic Background

	(1) H's Unem -ployed	(2) H's OccScore	(3) H's Weeks Worked	(4) H's Hours Worked	(5) H's ln(Wage)	(6) H's Nonwage > \$50
<i>Panel A: Father's OCCSCORE > Median</i>						
Educ	-0.417 (1.227)	0.094 (0.447)	0.261 (0.616)	0.321 (0.765)	0.061 (0.037)	3.645 (1.862)
\bar{Y}	11.658	28.448	43.982	38.141	7.213	32.414
<i>Panel B: Father's OCCSCORE ≤ Median</i>						
Educ	-4.925*** (1.126)	0.865 (0.452)	2.055*** (0.533)	2.641** (0.856)	0.077* (0.037)	-7.352** (2.247)
\bar{Y}	12.841	22.686	43.040	39.009	6.782	47.544
<i>Panel C: Children from Farm Households</i>						
Educ	-3.700*** (1.067)	1.428*** (0.418)	1.789*** (0.462)	1.320 (0.855)	0.082* (0.036)	-8.997*** (2.196)
\bar{Y}	12.685	21.779	42.962	39.234	6.691	49.809
<i>Panel D: Children from Non-farm Households</i>						
Educ	-1.317 (1.172)	0.365 (0.444)	0.619 (0.573)	0.909 (0.704)	0.080* (0.035)	2.669 (1.771)
\bar{Y}	11.890	28.250	43.910	38.121	7.200	33.001
<i>Panel E: Children from Rural Areas</i>						
Educ	-2.403* (0.992)	1.274** (0.458)	1.697*** (0.493)	1.607* (0.791)	0.099** (0.035)	-7.222** (2.257)
\bar{Y}	13.267	23.253	42.814	38.539	6.807	44.994
<i>Panel F: Children from Urban Areas</i>						
Educ	-0.757 (1.293)	0.041 (0.446)	0.019 (0.626)	0.398 (0.795)	0.048 (0.034)	2.607 (2.052)
\bar{Y}	10.589	29.801	44.668	38.497	7.329	30.409

The outcome variables are whether the husband was unemployed or employed on public emergency work projects in 1940 (*100), the husband's occupational score/weeks worked in 1939/hours worked per week/natural log of wage earnings, and whether the husband earned more than \$50 in nonwage earnings in 1940. Only IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The independent variables are the number of years of education completed by the wife (instrumented in the IV regressions) and the number of years completed by the husband (not reported). The sample in Panel A and B consists of married women aged 28 to 55 in 1940 whose fathers had OCCSCORE above and below the median level (N=2183674 and N=2653752). The sample in Panel C and D consists of married women aged 28 to 55 in 1940 who were from farm and non-farm households when they were children (N=2401011 and N=2436415). The sample in Panel E and F consists of married women aged 28 to 55 in 1940 who were from rural and urban areas when they were children (N=3538241 and N=1299185). The table also shows the mean of the outcome variables \bar{Y} in each category.

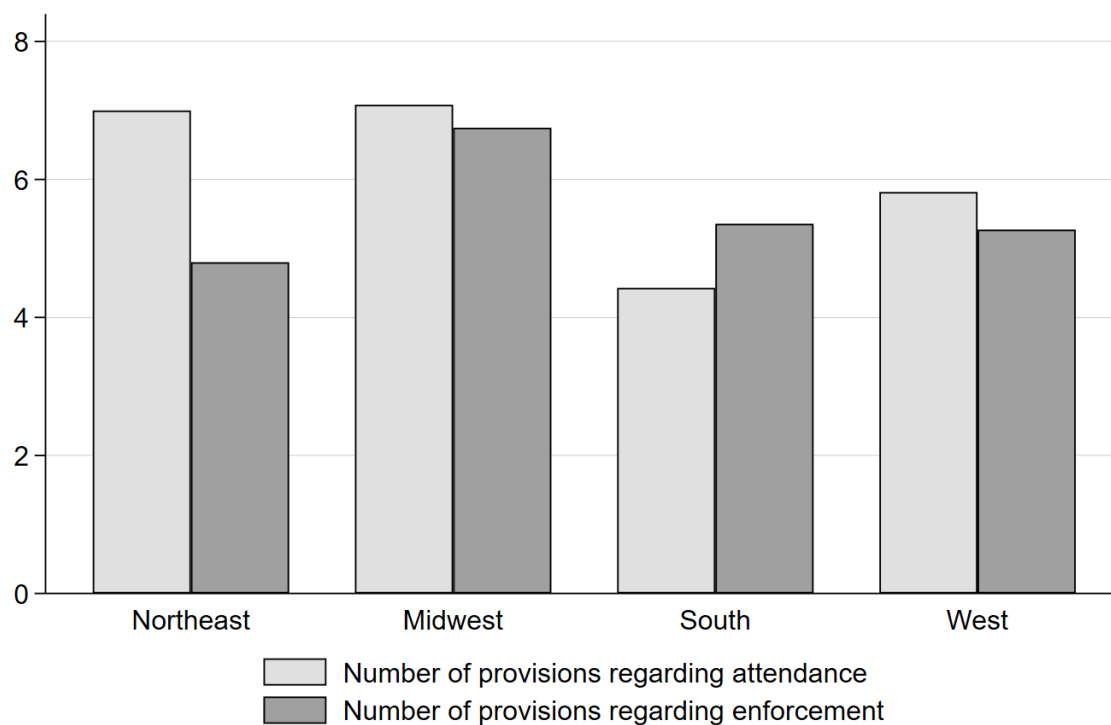
9 Appendix

Figure A1: Provisions Regarding Compulsory Attendance Laws

<i>Provisions Relating to Attendance, Age, Exemptions, Term of Attendance</i>	
1. Minimum compulsory attendance age less than 8	(32)
2. Maximum compulsory attendance age 16 or more	(42)
3. No exemptions allowed for poverty	(29)
4. No exemptions allowed for distance	(26)
5. No exemptions allowed for indefinite reasons	(31)
6. Eighth grade or more required for work permit	(20)
7. Attendance required for full term	(39)
8. Nine years or more attendance required	(33)
9. School term of 8 or more months	(25)
10. Attendance officers certificated	(8)
<i>Provisions for Enforcement</i>	
11. Annual or continuous school census	(36)
12. Truancy defined	(21)
13. Provides when truancy shall cease	(29)
14. Penalty on principals or teachers for failure to report truancy ..	(16)
15. Penalty on attendance officers for neglect of duty	(19)
16. Requires truancy to be reported immediately	(11)
17. Requires attendance officers to act immediately	(16)
18. Provides who shall grant exemptions	(38)
19. Provides who shall report truancy	(37)
20. Regular attendance officer required	(45)

The figure shows different provisions regarding compulsory attendance laws in Deffenbaugh and Keesecker 1935.

Figure A2: Number of Provisions Regarding Compulsory Attendance Laws in Different Regions



The figure shows the number of provisions regarding compulsory attendance laws in different regions with data collected by Deffenbaugh and Keesecker [1935](#).

Table A1: The Effect of Compulsory Attendance on Years of Schooling Completed

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Years of Schooling Completed==</i>	<i>One</i>	<i>Two</i>	<i>Three</i>	<i>Four</i>	<i>Five</i>	<i>Six</i>
6 Years	0.0017*** (0.0004)	0.0020*** (0.0005)	0.0029*** (0.0007)	0.0053*** (0.0010)	0.0096*** (0.0015)	0.0141*** (0.0019)
7 Years	0.0009 (0.0006)	0.0009 (0.0007)	0.0010 (0.0009)	0.0027* (0.0012)	0.0058*** (0.0017)	0.0108*** (0.0022)
8 Years	0.0021** (0.0007)	0.0023** (0.0008)	0.0029** (0.0010)	0.0057*** (0.0013)	0.0109*** (0.0018)	0.0177*** (0.0023)
9 Years +	0.0019* (0.0009)	0.0020 (0.0011)	0.0023 (0.0014)	0.0043* (0.0017)	0.0073** (0.0022)	0.0121*** (0.0027)
	(7)	(8)	(9)	(10)	(11)	(12)
<i>Years of Schooling Completed==</i>	<i>Seven</i>	<i>Eight</i>	<i>Nine</i>	<i>Ten</i>	<i>Eleven</i>	<i>Twelve</i>
6 Years	0.0136*** (0.0021)	0.0075*** (0.0021)	-0.0044 (0.0026)	-0.0099*** (0.0023)	-0.0090*** (0.0023)	-0.0069** (0.0023)
7 Years	0.0121*** (0.0025)	0.0067** (0.0025)	0.0087** (0.0030)	0.0017 (0.0028)	0.0027 (0.0030)	0.0046 (0.0029)
8 Years	0.0196*** (0.0027)	0.0124*** (0.0029)	0.0056 (0.0035)	-0.0054 (0.0029)	-0.0062* (0.0029)	-0.0026 (0.0029)
9 Years +	0.0155*** (0.0032)	0.0123*** (0.0034)	0.0405*** (0.0050)	0.0238*** (0.0043)	0.0065 (0.0042)	0.0076 (0.0040)

The table shows results from 12 separate regressions, and each regression has a different outcome variable that indicates whether one completed at least X years of schooling, where X ranges from 1 to 12. The independent variables are dummy variables that indicate different lengths of compulsory attendance laws. The regression includes birth state fixed effects and birth year by region fixed effects. The sample includes white and native-born women who were born between 1885 and 1912 ($N=18836237$).

Table A2: First Stage Results with An Alternative Set of Instruments

	(1) All Women	(2) Married Women	(3) Working Women	(4) Sample-line Women	(5) No South
<i>Required Years of Schooling</i>					
1 - 5 Years	0.028 (0.018)	0.020 (0.018)	0.038 (0.024)	0.038 (0.027)	0.019 (0.031)
6 Years	0.043* (0.021)	0.028 (0.022)	0.144*** (0.029)	0.063* (0.031)	0.024 (0.030)
7 Years	0.094*** (0.023)	0.079** (0.024)	0.227*** (0.032)	0.115*** (0.033)	0.076* (0.032)
8 Years	0.104*** (0.026)	0.086** (0.026)	0.241*** (0.034)	0.130*** (0.036)	0.079* (0.034)
9 Years +	0.180*** (0.030)	0.173*** (0.031)	0.220*** (0.038)	0.204*** (0.042)	0.155*** (0.038)
N	18836237	14902197	4151245	936920	14784416
F Stats	12.858	12.435	19.443	6.993	12.160

The outcome variable is years of education completed reported in the 1940 census. The independent variables are dummy variables indicating years of required compulsory attendance. The regression includes birth state fixed effects and birth year by region fixed effects. The sample from Column 1 is White, non-South, native-born women who were born between 1885 and 1912. Column 2, 3, 4 and 5 further restricts the sample to currently married women in 1940, working women who earned positive wages in 1940, sample-line women in the 1940 census, and women born outside of the South. First-Stage F Stats of all independent variables (but not fixed effects) are reported.

Table A3: 1940 Characteristics of Women in the Linked Census Tree Sample and Complete-Count Sample

	(1) Tree	(2) All Women
Age	39.9 (7.7)	39.8 (7.9)
Ever Married	89.3 (31.0)	87.5 (33.0)
Farm	22.5 (41.7)	19.7 (39.8)
Urban	54.8 (49.8)	58.8 (49.2)
Northeast	32.2 (46.7)	29.6 (45.7)
Midwest	39.8 (49.0)	41.9 (49.3)
South	21.9 (41.3)	21.6 (41.2)
Educ	9.6 (3.1)	9.5 (3.2)
Gainfully Employed	21.1 (40.8)	25.9 (43.8)
Self Employed	2.5 (15.7)	3.0 (17.0)
OCCSCORE	4.8 (9.9)	5.7 (10.5)
ln(Wage)	6.4 (1.0)	6.4 (1.0)
Nonwage Earnings > \$50	11.0 (31.3)	12.8 (33.4)
N	6270951	19244286

The outcome variables are age in 1940, whether one had been married in 1940 (*100), farm/urban status in 1940 (*100), whether one lived in the Northeast/Midwest/South region in 1940 (*100), years of education, whether one was gainfully employed/self-employed in 1940 (*100), one's OCCScore in 1940, natural log of wage earnings in 1940, and whether one had non-wage earnings higher than \$50 in 1940 (*100). The sample from Column 1 is the linked Census Tree sample of White and native-born women born between 1885 and 1912. The sample from Column 2 is the complete-count sample of White and native-born women born between 1885 and 1912.

Table A4: The Effect of Years of Schooling on Labor Market Outcomes (No South)

	(1) Gainful Occupation		(2) Weeks Worked		(3) Hours Worked		(4) ln Wage	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Educ	2.333*** (0.020)	11.644*** (2.282)	0.984*** (0.009)	5.135*** (1.011)	0.772*** (0.007)	3.612*** (0.743)	0.113*** (0.001)	0.171*** (0.026)
\bar{Y}	26.484	26.484	11.307	11.307	9.360	9.360	6.439	6.439
	(5) Steno- graphers		(6) Clerical Workers		(7) Book- keepers		(8) House- keepers	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Educ	0.557*** (0.014)	4.462*** (0.880)	0.245*** (0.004)	2.317*** (0.525)	0.219*** (0.003)	1.633*** (0.270)	-0.290*** (0.002)	-2.048*** (0.437)
\bar{Y}	2.714	2.714	1.927	1.927	1.383	1.383	2.113	2.113

The outcome variables are whether one had a gainful occupation in 1940 (*100), weeks worked in 1939, weekly hours worked in 1940, the natural log of wages reported in 1940, and whether the woman was a stenographer, a clerical worker, a bookkeeper, or a housekeeper (*100). The independent variable is the number of years of education completed. Both OLS and IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample is White, non-South, native-born women who were born between 1885 and 1912 (N=14784416). Column 4 further restricts the sample to working women who earned positive wages (N=3371943).

Table A5: The Returns to Education on Labor Market Outcomes By Socioeconomic Background (No South)

	(1) Gainful Occ.	(2) Weeks Worked	(3) Hours Worked	(4) OccScore	(5) ln(Wage)	(6) Steno- grapher	(7) House- keeper
<i>Panel A: Father's OCCSCORE > Median</i>							
Educ	5.485** (1.981)	2.673** (0.933)	1.961** (0.727)	1.532** (0.475)	0.166*** (0.044)	3.189*** (0.832)	-0.647** (0.237)
\bar{Y}	24.534	10.355	8.312	5.685	6.534	3.338	0.968
<i>Panel B: Father's OCCSCORE ≤ Median</i>							
Educ	8.506*** (1.383)	3.380*** (0.565)	2.598*** (0.446)	2.161*** (0.338)	0.267*** (0.058)	2.229*** (0.440)	-0.532** (0.205)
\bar{Y}	16.661	7.932	6.353	3.589	6.195	1.166	1.371
<i>Panel C: Children from Farm Households</i>							
Educ	7.495*** (1.124)	2.753*** (0.457)	2.056*** (0.376)	1.828*** (0.276)	0.287*** (0.077)	1.235*** (0.220)	-0.422* (0.214)
\bar{Y}	15.131	7.503	6.025	3.173	6.072	0.738	1.425
<i>Panel D: Children from Non-farm Households</i>							
Educ	5.483** (1.843)	2.514** (0.852)	2.094** (0.672)	1.573*** (0.443)	0.202*** (0.040)	3.109*** (0.776)	-0.582** (0.217)
\bar{Y}	24.176	10.229	8.204	5.593	6.526	3.241	0.995
<i>Panel E: Children from Rural Areas</i>							
Educ	8.736*** (1.343)	3.532*** (0.555)	2.818*** (0.445)	2.204*** (0.326)	0.275*** (0.050)	1.840*** (0.405)	-0.645** (0.223)
\bar{Y}	17.111	7.928	6.379	3.693	6.164	1.058	1.415
<i>Panel F: Children from Urban Areas</i>							
Educ	2.086 (1.849)	1.227 (0.855)	0.524 (0.681)	0.704 (0.446)	0.158** (0.054)	4.042*** (0.995)	-0.306 (0.256)
\bar{Y}	26.143	10.984	8.794	6.128	6.612	4.001	0.822

The outcome variables are whether one had a gainful occupation in 1940 (*100), weeks worked in 1939, weekly hours worked in 1940, the natural log of wages reported in 1940, and whether the woman was a stenographer, a clerical worker, a bookkeeper, or a housekeeper (*100). The independent variable is the number of years of education completed. Only IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample in Panel A and B consists of non-southern women aged 28 to 55 in 1940 whose fathers had OCCSCORE above and below the median level (N=2475170 and N=2224390). The sample in Panel C and D consists of non-southern women aged 28 to 55 in 1940 who were from farm and non-farm households when they were children (N=1942926 and N=2756634). The sample in Panel E and F consists of non-southern women aged 28 to 55 in 1940 who were from rural and urban areas when they were children (N=3057821 and N=1641739). The table also shows the mean of the outcome variables \bar{Y} in each category.

Table A6: The Returns to Education on Marriage Market Outcomes (No South)

	(1) Never Married		(2) Divorced/ Separated		(3) Age at First Marriage		(4) H's Educ	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Educ	1.544*** (0.014)	0.333 (0.927)	0.045*** (0.003)	1.590*** (0.361)	0.400*** (0.003)	0.817** (0.293)	0.687*** (0.001)	0.963*** (0.062)
\bar{Y}	13.356	13.356	2.556	2.556	21.912	21.912	9.401	9.401

The outcome variables are whether one had never been married (*100), whether one had been divorced or separated (*100), age at first marriage, and the husband's years of education. The independent variable is the number of years of education completed. Both OLS and IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample is White, native-born women who were born between 1885 and 1912 (N=14784416). Column 3 further restricts the sample to sample-line women (N=552530) since information for age at first marriage is only available for this group.

Table A7: The Returns to Education on Marriage Outcomes By Socioeconomic Background (No South)

	(1) Never Married	(2) Divorced/ Separated	(3) Age at First Marriage	(4) Husband's Education
<i>Panel A: Father's OCCSCORE > Median</i>				
Educ	-0.861 (1.713)	0.616 (0.324)	0.990** (0.356)	0.789*** (0.063)
\bar{Y}	13.521	1.727	21.716	9.885
<i>Panel B: Father's OCCSCORE ≤ Median</i>				
Educ	3.138*** (0.885)	0.522** (0.197)	0.318 (0.358)	0.817*** (0.052)
\bar{Y}	8.014	1.234	21.373	8.821
<i>Panel C: Children from Farm Households</i>				
Educ	2.677*** (0.698)	0.108 (0.163)	0.227 (0.402)	0.748*** (0.046)
\bar{Y}	7.034	1.104	21.351	8.580
<i>Panel D: Children from Non-farm Households</i>				
Educ	-0.528 (1.581)	0.807** (0.293)	0.965** (0.346)	0.810*** (0.058)
\bar{Y}	13.239	1.717	21.696	9.857
<i>Panel E: Children from Rural Areas</i>				
Educ	2.065** (0.732)	0.513** (0.182)	0.321 (0.368)	0.814*** (0.048)
\bar{Y}	7.654	1.276	21.305	8.837
<i>Panel F: Children from Urban Areas</i>				
Educ	-1.195 (1.859)	0.635 (0.363)	1.123** (0.421)	0.683*** (0.082)
\bar{Y}	15.284	1.815	22.039	10.195

The outcome variables are whether one had never been married (*100), whether one had been divorced or separated (*100), age at first marriage, and the husband's years of education. The independent variable is the number of years of education completed. Only IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The sample in Panel A and B consists of non-southern women aged 28 to 55 in 1940 whose fathers had OCCSCORE above and below the median level (N=2475170 and N=2224390). The sample in Panel C and D consists of non-southern women aged 28 to 55 in 1940 who were from farm and non-farm households when they were children (N=1942926 and N=2756634). The sample in Panel E and F consists of non-southern women aged 28 to 55 in 1940 who were from rural and urban areas when they were children (N=3057821 and N=1641739). The table also shows the mean of the outcome variables \bar{Y} in each category.

Table A8: The Returns to Education on Match Quality - Married Women Only (No South)

	(1) H's Unemployed		(2) H's OccScore		(3) H's Weeks Worked	
	OLS	IV	OLS	IV	OLS	IV
Educ	-0.995*** (0.012)	-3.676** (1.240)	0.360*** (0.004)	0.683 (0.522)	0.380*** (0.006)	1.083 (0.574)
H's Educ	-0.976*** (0.008)	0.431 (0.651)	1.177*** (0.006)	1.007*** (0.273)	0.511*** (0.006)	0.142 (0.302)
\bar{Y}	12.974	12.974	26.436	26.436	43.196	43.196
	(4) H's Hours Worked		(5) H's ln(Wage)		(6) H's Nonwage Earnings > \$50	
	OLS	IV	OLS	IV	OLS	IV
Educ	0.573*** (0.008)	0.752 (0.774)	0.046*** (0.000)	0.087* (0.040)	1.067*** (0.021)	-1.529 (1.967)
H's Educ	0.370*** (0.010)	0.277 (0.409)	0.075*** (0.000)	0.053* (0.021)	0.063* (0.031)	1.426 (1.030)
\bar{Y}	37.942	37.942	7.103	7.103	35.253	35.253

The outcome variables are whether the husband was unemployed or employed on public emergency work projects in 1940 (*100), the husband's occupational score, the husband's weeks worked in 1939, the husband's hours worked per week, the husband's natural log of wage earnings, and whether the husband earned more than \$50 in nonwage earnings in 1940. Both OLS and IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The independent variables are the number of years of education completed by the wife (instrumented in the IV regressions) and the number of years completed by the husband. The sample is White, native-born women who were married and with her husband present in the household in 1940 (N=9643189). Columns 5 further restricts the sample to households where the husband was earning positive wages in 1940 (N=6873292). The table also shows the mean of the outcome variables \bar{Y} in each category.

Table A9: The Returns to Education on Match Quality By Socioeconomic Background (No South)

	(1) H's Unem -ployed	(2) H's OccScore	(3) H's Weeks Worked	(4) H's Hours Worked	(5) H's ln(Wage)	(6) H's Nonwage > \$50
<i>Panel A: Father's OCCSCORE > Median</i>						
Educ	-0.750 (1.298)	0.095 (0.477)	0.508 (0.656)	0.479 (0.801)	0.071 (0.039)	2.635 (1.925)
\bar{Y}	11.785	28.620	43.930	37.848	7.236	31.430
<i>Panel B: Father's OCCSCORE ≤ Median</i>						
Educ	-5.287*** (1.062)	0.598 (0.412)	2.228*** (0.502)	3.058*** (0.810)	0.069* (0.035)	-7.948*** (2.109)
\bar{Y}	12.999	23.443	43.181	39.390	6.886	45.962
<i>Panel C: Children from Farm Households</i>						
Educ	-3.940*** (0.960)	1.032** (0.362)	1.818*** (0.423)	1.681* (0.793)	0.069* (0.033)	-8.748*** (1.937)
\bar{Y}	12.889	22.338	43.080	39.802	6.788	48.638
<i>Panel D: Children from Non-farm Households</i>						
Educ	-1.807 (1.243)	0.430 (0.477)	0.910 (0.616)	1.099 (0.740)	0.092* (0.038)	1.946 (1.837)
\bar{Y}	11.977	28.459	43.882	37.861	7.227	32.059
<i>Panel E: Children from Rural Areas</i>						
Educ	-2.890** (0.973)	1.065* (0.435)	1.994*** (0.491)	2.057** (0.796)	0.100** (0.035)	-8.332*** (2.227)
\bar{Y}	13.584	23.874	42.835	38.678	6.887	43.337
<i>Panel F: Children from Urban Areas</i>						
Educ	-0.327 (1.374)	-0.000 (0.480)	0.101 (0.679)	0.516 (0.851)	0.052 (0.036)	2.046 (2.203)
\bar{Y}	10.758	29.739	44.546	38.164	7.333	29.863

The outcome variables are whether the husband was unemployed or employed on public emergency work projects in 1940 (*100), the husband's occupational score/weeks worked in 1939/hours worked per week/natural log of wage earnings, and whether the husband earned more than \$50 in nonwage earnings in 1940. Only IV estimates are reported. The regression includes birth state fixed effects and birth year by region fixed effects. The independent variables are the number of years of education completed by the wife (instrumented in the IV regressions) and the number of years completed by the husband (not reported). The sample in Panel A and B consists of non-southern married women aged 28 to 55 in 1940 whose fathers had OCCSCORE above and below the median level (N=1818473 and N=1822169). The sample in Panel C and D consists of non-southern married women aged 28 to 55 in 1940 who were from farm and non-farm households when they were children (N=1607083 and N=2033559). The sample in Panel E and F consists of non-southern married women aged 28 to 55 in 1940 who were from rural and urban areas when they were children (N=2492246 and N=1148396). The table also shows the mean of the outcome variables \bar{Y} in each category.