# ONLINE APPENDIX:
# Women's Suffrage and Children's Education

Esra Kose, Elira Kuka and Na'ama Shenhav

August, 2020

# A  Appendix A: Empirical Appendix

Table A.1: Progressive Voting in the Senate Before and After Suffrage

| | Share Yes on Prog. | | Share Abstain on Prog. | | Share No on Prog. | |
|---|---|---|---|---|---|---|
| | Level | Log | Level | Log | Level | Log |
| *A: Total Progressive Voting* | | | | | | |
| Post Suffrage | -0.001 | -0.002 | -0.014 | -0.050 | 0.015* | 0.045** |
| | (0.017) | (0.047) | (0.018) | (0.071) | (0.007) | (0.022) |
| Mean Y | 0.427 | -0.927 | 0.274 | -1.394 | 0.269 | -1.381 |
| Observations | 13385 | 12987 | 13385 | 11313 | 13385 | 12535 |
| *B: Within-Politician Progressive Voting* | | | | | | |
| Post Suffrage | -0.024* | -0.051 | 0.020 | 0.020 | 0.003 | 0.013 |
| | (0.014) | (0.032) | (0.017) | (0.072) | (0.008) | (0.024) |
| Mean Y | 0.433 | -0.904 | 0.260 | -1.470 | 0.279 | -1.341 |
| Observations | 5642 | 5518 | 5642 | 4858 | 5642 | 5366 |

Notes: This table contains results obtained when the dependent variable is (i) the share of progressive bills that a senator voted for (columns 1-2); (ii) the share of progressive bills that a senator abstained from (columns 3-4); and (iii) the share of progressive bills that the senator voted against (columns 5-6). We show results with levels in odd columns and logs in the even columns. Post-suffrage is an indicator for the years after suffrage was passed. Regressions include year fixed effects and state fixed effects. Standard errors are clustered at the state level. Panel A includes all senators voting between 1900 and 1930 (385 unique members), while Panel B only includes senators present for at least 1 year prior to suffrage, and 1 year after suffrage (108 unique members.) Sources: Coding of progressive and anti-progressive bills from Miller (2008), 1900–1930 Senate voting data from Voteview: Congressional Roll Call Votes Database. * p<0.10, ** p<0.05, *** p<0.01.

Table A.2: Effect of Suffrage on Years of Education –
Change in Coefficients as Controls are Added

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| *A: All* | | | | | | |
| Suff Share 0-15 | 0.462** | 0.442* | 0.417** | 0.404** | 0.401** | 0.091 |
|  | (0.217) | (0.231) | (0.173) | (0.179) | (0.179) | (0.203) |
| Mean Education | 9.647 | 9.647 | 9.647 | 9.647 | 9.647 | 9.647 |
| Observations | 1555475 | 1555475 | 1555475 | 1555475 | 1555475 | 1555475 |
| | | | | | | |
| *B: Whites* | | | | | | |
| Suff Share 0-15 | 0.417* | 0.369 | 0.374** | 0.373** | 0.371** | 0.062 |
|  | (0.224) | (0.236) | (0.167) | (0.169) | (0.169) | (0.197) |
| Mean Education | 9.967 | 9.967 | 9.967 | 9.967 | 9.967 | 9.967 |
| Observations | 1393855 | 1393855 | 1393855 | 1393855 | 1393855 | 1393855 |
| | | | | | | |
| *C: Blacks* | | | | | | |
| Suff Share 0-15 | 1.502*** | 1.470*** | 1.121*** | 1.111*** | 1.099*** | 0.884*** |
|  | (0.312) | (0.279) | (0.282) | (0.283) | (0.300) | (0.295) |
| Mean Education | 6.810 | 6.810 | 6.810 | 6.810 | 6.810 | 6.810 |
| Observations | 157028 | 157028 | 157028 | 157028 | 157028 | 157028 |
| BSt,BY FE | Yes | Yes | Yes | Yes | Yes | Yes |
| BSt Trends | | Yes | Yes | Yes | Yes | Yes |
| State Controls | | | Yes | Yes | Yes | Yes |
| Compulsory and Rosenwald | | | | Yes | Yes | Yes |
| CYxBY FE | | | | | Yes | Yes |
| RegionxBY FE | | | | | | Yes |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variable is suffrage exposure, which is defined as the share of time between birth and age 15 that an individual was exposed to a suffrage law in his state of birth. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A.3: F-Tests Predicting Suffrage Year, Late Suffrage ($\geq$ 1920), and Post-Suffrage: Levels of Covariates

| | 1 to 3 yrs Pre-suff. (Suff. Yr >1917) | | 1900 (Suff. Yr >1910) | | 1910 (Suff. Yr >1910) | | 3 yrs. Pre-/Post- Suff |
|---|---|---|---|---|---|---|---|
| | Suff. Yr. | Late | Suff. Yr. | Late | Suff. Yr. | Late | Post |
| Pct. White | -0.015 | -0.013 | 6.854 | 0.149 | 0.405 | -0.179 | -0.062 |
| | (0.019) | (0.012) | (4.356) | (0.917) | (3.804) | (0.760) | (0.048) |
| Pct. Urban | 0.003 | 0.004 | 0.019 | 0.006 | 0.016 | -0.000 | -0.020 |
| | (0.035) | (0.022) | (0.063) | (0.013) | (0.056) | (0.011) | (0.015) |
| Pct. Foreign | -0.059 | -0.022 | | | | | 0.008 |
| | (0.039) | (0.025) | | | | | (0.033) |
| Ln Pop | -0.715 | -0.404 | 1.120 | 0.129 | 0.529 | 0.139 | -0.616 |
| | (0.764) | (0.483) | (0.849) | (0.179) | (0.768) | (0.153) | (0.583) |
| Pct. Emp. Manuf. | 5.472 | 3.030 | | | | | 0.448 |
| | (6.541) | (4.133) | | | | | (0.864) |
| Ln Manuf. Wage per Earner | -1.409 | 0.350 | | | | | -1.378 |
| | (1.986) | (1.255) | | | | | (0.865) |
| Ln Avg. Farm Value | 0.095 | 0.046 | | | | | 0.405 |
| | (0.599) | (0.378) | | | | | (0.307) |
| Ln Tax-Reported Income per Capita | 0.245 | -0.010 | | | | | 0.077 |
| | (0.924) | (0.584) | | | | | (0.167) |
| Ln Number Hospitals | 0.742 | 0.378 | | | | | -0.179 |
| | (0.866) | (0.547) | | | | | (0.140) |
| Ln Doctors per Capita | -0.995 | -0.512 | | | | | 0.331 |
| | (1.018) | (0.643) | | | | | (0.770) |
| Ln Number of Schools per Capita | -0.137 | -0.045 | | | | | |
| | (0.763) | (0.482) | | | | | |
| Compulsory Attendance | 0.030 | -0.030 | -0.134 | -0.025 | -0.036 | -0.039 | |
| | (0.132) | (0.083) | (0.184) | (0.039) | (0.307) | (0.061) | |
| Schooling for Child Labor | 0.011 | -0.052 | -0.269 | -0.026 | 0.330 | -0.082 | |
| | (0.151) | (0.095) | (0.160) | (0.034) | (0.442) | (0.088) | |
| Pct. Foreign White | | | -0.005 | -0.001 | -0.011* | -0.001 | |
| | | | (0.005) | (0.001) | (0.006) | (0.001) | |
| Ln Total Value of Farms | | | -1.542* | -0.164 | -1.040 | -0.234 | |
| | | | (0.804) | (0.169) | (0.748) | (0.149) | |
| Obs | 31 | 31 | 43 | 43 | 43 | 43 | 217 |
| F-test P-Value | 0.401 | 0.659 | 0.263 | 0.607 | 0.441 | 0.422 | 0.266 |
| Partial R2 | 0.317 | 0.188 | 0.109 | 0.080 | 0.087 | 0.102 | 0.006 |

Notes: Columns 1-6 of this table test whether the year of suffrage (columns 1, 3, and 5) or or "late" suffrage (columns 2, 4, and 6), a dummy for suffrage year $\geq$ 1920, is associated with *levels* of state-level covariates prior to suffrage, net of region fixed effects. Columns 1-2 use annual covariates from Lleras-Muney (2002) from 1915-17, and restrict to states that passed suffrage after 1917, and columns 3-4 and 5-6, respectively use state-level covariates for 1900 and 1910 from ICPSR 2896, restricting to states that passed suffrage after 1910. Column 7 tests whether state-level demographic variables changed in the three years after suffrage, relative to the three years before suffrage, using the states from columns 1-2. We include regionxyear and state fixed effects for that specification. Standard errors are clustered on state in column (7). The F-test p-value comes from a test that the coefficients shown are jointly equal to zero, and the partial $R^2$ reports the $R^2$ of the variables shown in the table. * p<0.10, ** p<0.05, *** p<0.01.

4

Table A.4: F-Tests Predicting Suffrage Year and Late Suffrage ($\geq$ 1920):
Changes in Covariates

| | 1915-1917 (Suff Yr >1917) | | 1900-1910 (Suff Yr >1910) | |
|---|---|---|---|---|
| | Suff. Yr. | Late | Suff. Yr. | Late |
| Chg. Pct. White | 0.905 | 0.374 | -33.582 | -4.486 |
| | (0.575) | (0.422) | (21.067) | (4.410) |
| Chg. Pct. Urban | -0.352 | -0.092 | 0.643* | 0.120* |
| | (0.300) | (0.220) | (0.327) | (0.068) |
| Chg. Pct. Foreign | -0.630 | -0.532 | | |
| | (0.623) | (0.457) | | |
| Chg. Pct. Emp. Manuf. | -0.858 | -0.232 | | |
| | (4.350) | (3.190) | | |
| Chg. Ln Pop | -5.098 | -0.106 | -1.466 | -0.565 |
| | (8.388) | (6.152) | (2.037) | (0.426) |
| Chg. Ln Manuf. Wage per Earner | 5.133 | 3.963 | | |
| | (4.260) | (3.124) | | |
| Chg. Ln Avg. Farm Value | -11.349 | -2.712 | | |
| | (7.246) | (5.314) | | |
| Chg. Ln Tax-Reported Income per Capita | -0.563 | -0.214 | | |
| | (0.516) | (0.378) | | |
| Chg. Ln Number Hospitals | -4.868* | -2.487 | | |
| | (2.378) | (1.744) | | |
| Chg. Ln Doctors per Capita | 5.920 | -0.401 | | |
| | (9.567) | (7.016) | | |
| Chg. Ln Number of Schools per Capita | -0.861 | -0.667 | | |
| | (1.861) | (1.365) | | |
| Chg. Compulsory Attendance | -0.099 | -0.036 | 0.180 | 0.031 |
| | (0.139) | (0.102) | (0.148) | (0.031) |
| Chg. Schooling for Child Labor | 0.182 | 0.057 | 0.212 | 0.010 |
| | (0.149) | (0.109) | (0.151) | (0.032) |
| Chg. Pct. Foreign White | | | -0.021 | -0.001 |
| | | | (0.019) | (0.004) |
| Chg. Ln Total Value of Farms | | | -1.612 | -0.218 |
| | | | (1.457) | (0.305) |
| Obs | 31 | 31 | 43 | 43 |
| F-test P-Value | 0.071 | 0.410 | 0.139 | 0.333 |
| Partial R2 | 0.304 | 0.047 | 0.131 | 0.114 |

Notes: This table tests whether the year of suffrage (columns 1 and 3) or "late" suffrage (columns 2 and 4), a dummy for suffrage year $\geq$ 1920, is associated with *changes* in state-level covariates prior to suffrage, net of region fixed effects. Columns 1-2 use annual data from Lleras-Muney (2002) from 1915-17, limiting the sample to states that passed suffrage after 1917, and columns 3-4 use state-level covariates for 1900 and 1910 from ICPSR 2896, limiting the sample to states that passed suffrage after 1910. Hence, the independent variables are either changes in state-level covariates between 1915-17 (columns 1 and 2) or changes in state-level covariates between 1900-10. There were no changes in compulsory schooling laws between 1915-17 for this sample, so instead we use changes from 1907-17 in columns (1)-(2). The F-test p-value comes from a test that the coefficients shown are jointly equal to zero, and the partial $R^2$ reports the $R^2$ of the variables shown in the table. * p<0.10, ** p<0.05, *** p<0.01.

Table A.5: Correlation between Timing of Suffrage and Progressive Era Laws

| | | | | | | |
|---|---|---|---|---|---|---|
| Year of Workers' Compensation Law | -0.145 (0.102) | | | | | |
| Year of Prohibition | | 0.040 (0.082) | | | | |
| Year of Women's Minimum Wage Law | | | 0.382 (0.488) | | | |
| Year of State Mother's Pension Law | | | | 0.389 (0.282) | | |
| Year of State General Federation of Women's Clubs Chapter | | | | | 0.696 (0.417) | |
| Year of Women's Maximum Hour Law | | | | | | -0.270 (0.391) |
| Observations | 47 | 29 | 15 | 46 | 48 | 40 |

Notes: This table contains results obtained when the dependent variable is the year of suffrage approved in each state and the main independent variable is the year of the listed Progressive era law. All regressions include region fixed effects. Sources: Suffrage laws are from Lott and Kenny (1999) and Miller (2008*b*). Data on mother's pension laws, state General Federation of Women's Clubs chapter establishment, women's maximum hour laws, women's minimum wage laws from Skocpol (1992); workers' compensation law dates from Kantor and Fishback (1996); and state prohibition laws from Depew, Edwards and Owens (2013).

Table A.6: Correlation between Timing of Suffrage and New Deal Spending

| | Outcome = Year Suffrage | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Total Relief per Capita (1967 dol.) | 0.018 (0.027) | | |
| Direct Relief per Capita (1967 dol.) | | 0.015 (0.039) | |
| Work Relief per Capita (1967 dol.) | | | 0.031 (0.070) |
| Observations | 36 | 36 | 36 |
| X mean | 133 | 74 | 32 |

Notes: This table contains results obtained when the dependent variable is the year that suffrage was approved in each state and the main independent variable is the generosity of New Deal relief spending in the state, the total (1967 $) spent between 1929 and 1940 normalized by the 1930 population (Fishback, Haines and Kantor, 2007*a*). All regressions include region fixed effects. Total relief is the sum of direct and work relief, and is sourced from data made available from Fishback, Haines and Kantor (2007*a*). The sample excludes states that passed suffrage prior to 1900. Suffrage laws are from Lott and Kenny (1999) and Miller (2008*b*). * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A.7: Correlation between Suffrage and Compulsory Schooling Laws

|  | Comp. Attendance | Child Labor |
|---|---|---|
| Post Suffrage Law | -0.545 | 0.352 |
|  | (0.437) | (0.420) |
| Observations | 1488 | 1488 |

Notes: This table contains results obtained when the dependent variable is the parameter of a compulsory schooling or child labor law and the main independent variable is an indicator for whether suffrage was passed in the state. All regressions include state fixed effects, state trends, and region by year fixed effects. Standard errors are clustered at the state level. Sources: Data used in Goldin and Katz (2003$b$) obtained from the website of Claudia Goldin. * p<0.10, ** p<0.05, *** p<0.01.

Table A.8: Correlation between Suffrage and the Elements of Compulsory Schooling Laws

|  | Age Leave Sch. | Age Work | Min Sch. to Work | Min Sch. to Drop |
|---|---|---|---|---|
| Post Suffrage Law | -0.110 | 0.284 | -0.397 | -0.510 |
|  | (0.365) | (0.985) | (0.476) | (2.958) |
| Observations | 1466 | 1488 | 1392 | 1422 |

Notes: This table contains results obtained when the dependent variable is the parameter of a compulsory schooling or child labor law and the main independent variable is an indicator for whether suffrage was passed in the state. All regressions include state fixed effects, state trends, and region by year fixed effects. Standard errors are clustered at the state level. Sources: Data used in Goldin and Katz (2003$b$) obtained from the website of Claudia Goldin. * p<0.10, ** p<0.05, *** p<0.01.

Table A.9: Effect of Suffrage on Years of Education –
Marginal Effect of Each Additional Year of Exposure by Age

|  | All | Whites | Blacks |
|---|---|---|---|
| Add'l Effect of Treatment from 0-5 | 0.007 | 0.008 | -0.000 |
|  | (0.009) | (0.008) | (0.027) |
| Add'l Effect of Treatment between 6-10 | 0.005 | 0.000 | 0.090** |
|  | (0.019) | (0.018) | (0.035) |
| Effect of Treatment between 11-15 | 0.005 | 0.004 | 0.079*** |
|  | (0.013) | (0.013) | (0.028) |
| Mean Education | 9.647 | 9.967 | 6.810 |
| P-Value for Test of Equality | 0.979 | 0.854 | 0.095 |
| R-Squared | 0.194 | 0.123 | 0.215 |
| Observations | 1555475 | 1393855 | 157028 |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variables are a spline in the number of years an individual is treated between the ages of 0 and 15. Therefore the coefficient for "Treated between X-Y" is the additional impact of one year of treatment during that age range; the text described an example for calculating the total effect of exposure to suffrage. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. All regressions include sample weights, and standard errors are clustered at the state level. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. Source: 1940-1960 decennial censuses. * p<0.10, ** p<0.05, *** p<0.01.

Table A.10: Effect of Suffrage on Years of Education –
Effects Beyond Age 15

|  | All | Whites | Blacks |
|---|---|---|---|
| Suff Share 0-15 | 0.090 | 0.054 | 0.738*** |
|  | (0.242) | (0.236) | (0.230) |
| Suff Share 16-22 | 0.008 | -0.011 | -0.033 |
|  | (0.071) | (0.071) | (0.263) |
| Suff Share 23-30 | -0.012 | -0.008 | -0.417 |
|  | (0.104) | (0.105) | (0.404) |
| Mean Education | 9.647 | 9.967 | 6.810 |
| R-Squared | 0.194 | 0.123 | 0.215 |
| Observations | 1555475 | 1393855 | 157028 |

Notes: This table contains results obtained when the
dependent variable is years of education and the main
independent variables are "Suff Share x-y", which are
defined as the share of time between ages x and y
that an individual was exposed to a suffrage law in his
state of birth. All regressions include controls for de-
mographics and state-level characteristics, birth state
and birth year fixed effects, birth state linear time
trends, as well as region-by-birth year and census year-
by-birth year fixed effects. All regressions include sam-
ple weights, and standard errors are clustered at the
state level. The sample consists of individuals born be-
tween 1880 and 1930, and that are at least 20 years
old at the time of observation. We exclude states that
passed suffrage prior to 1900. Source: 1940-1960 de-
cennial censuses. * p<0.10, ** p<0.05, *** p<0.01.

Table A.11: Effect of Suffrage on Years of Education –
Differential Effects by Region

|  | All | White | Black |
|---|---|---|---|
| Suff Share 0-15 x Northeast | 0.291* | 0.267 | 1.161* |
|  | (0.168) | (0.168) | (0.686) |
| Suff Share 0-15 x Midwest | -0.168 | -0.169 | 0.989*** |
|  | (0.258) | (0.253) | (0.324) |
| Suff Share 0-15 x South | 1.018** | 0.957** | 0.696 |
|  | (0.470) | (0.473) | (0.432) |
| Suff Share 0-15 x West | 0.540*** | 0.544** | 13.683*** |
|  | (0.193) | (0.213) | (4.161) |
| Mean Education | 9.647 | 9.967 | 6.810 |
| P-Value NE=MW=S=W | 0.057 | 0.065 | 0.029 |
| P-Value NE=MW=S | 0.074 | 0.096 | 0.794 |
| Observations | 1555475 | 1393855 | 157028 |

Notes: This table contains results obtained when the dependent
variable is years of education and the main independent variable
is suffrage exposure, which is defined as the share of time between
birth and age 15 that an individual was exposed to a suffrage law
in his state of birth. All regressions include controls for demo-
graphics and state-level characteristics, birth state and birth year
fixed effects, birth state linear time trends, as well as census year-
by-birth year fixed effects. Estimates are weighted using Census
sample weights, and standard errors are clustered on the state of
birth. The sample consists of individuals born between 1880 and
1930, and that are at least 20 years old at the time of observation.
We exclude states that passed suffrage prior to 1900. The bottom
rows of the table test the hypothesis that the effects are equal
for all four regions (NE, MW, S, W) or for all regions except the
West, since there we have some concerns about overfitting for
blacks in the West. For reference, the number of observations
for whites (blacks) in the NE, MW, S, and W, respectively, is:
397,080 (7,381); 509,551 (7,946); 421,211 (140,982); 66,013 (537).
The average years of education for whites (blacks) pre-suffrage in
the NE, MW, S, and W, respectively, is: 9.3 (7.9); 9.1 (7.8); 8.0
(5.1); 9.1 (7.9). Source: 1940-1960 decennial censuses. * p<0.10,
** p<0.05, *** p<0.01.

Table A.12: Effect of Suffrage on Log Infant Mortality –
Interactions with South and with Pre-Suffrage Education Levels

|  | (1) | (2) | (3) |
|---|---|---|---|
| *A: All* | | | |
| Post Suffrage | -0.081** | -0.059** | -0.629** |
|  | (0.031) | (0.025) | (0.272) |
| Post Suffrage x South |  | -0.125** |  |
|  |  | (0.057) |  |
| Post Suffrage * Pre-Period Average Education |  |  | 0.061** |
|  |  |  | (0.028) |
| Mean Y | 8.820 | 8.820 | 8.820 |
| Observations | 760 | 760 | 760 |
| N States | 43 | 43 | 43 |
|  | | | |
| *B: Whites* | | | |
| Post Suffrage | -0.096** | -0.078** | -0.760* |
|  | (0.037) | (0.032) | (0.380) |
| Post Suffrage x South |  | -0.100 |  |
|  |  | (0.061) |  |
| Post Suffrage * Pre-Period Average Education |  |  | 0.073* |
|  |  |  | (0.040) |
| Mean Y | 8.667 | 8.667 | 8.667 |
| Observations | 724 | 724 | 724 |
| N States | 43 | 43 | 43 |
|  | | | |
| *C: Blacks* | | | |
| Post Suffrage | -0.015 | 0.061 | -0.772*** |
|  | (0.047) | (0.051) | (0.221) |
| Post Suffrage x South |  | -0.424*** |  |
|  |  | (0.108) |  |
| Post Suffrage * Pre-Period Average Education |  |  | 0.101*** |
|  |  |  | (0.030) |
| Mean Y | 5.703 | 5.703 | 5.703 |
| Observations | 677 | 677 | 675 |
| N States | 42 | 42 | 41 |

Notes: The dependent variable is log infant mortality. Post suffrage is a dummy variable that takes the value of one if the state passed suffrage by the current year. We include interactions between post suffrage and either South (column 2) or pre-suffrage education levels (column 3). Pre-suffrage education is calculated for each state (and race for Panels B and C) as the average education in that sample among individuals age 16 and above in the year that suffrage was passed. All regressions include controls for state-level characteristics, state and year fixed effects, and state linear time trends. Estimates are weighted using population weights, and standard errors are clustered on the state. We exclude states that passed suffrage prior to 1900. Source: 1900 to 1932 mortality records by state, age, race, and gender from the Centers for Disease Control and Prevention. * p<0.10, ** p<0.05, *** p<0.01.

Table A.13: Effect of Suffrage on Years of Education –
Accounting for Selective Survivorship with Lee (2009) Bounds

|  | Bounds for Whites | | Bounds for Blacks | |
| --- | --- | --- | --- | --- |
|  | Lower | Upper | Lower | Upper |
| Suff Share 0-15 | -0.143 | 0.645** | 0.914 | 3.151*** |
|  | (0.200) | (0.280) | (0.552) | (0.626) |
| Observations | 1348682 | 1350468 | 139785 | 142347 |

Notes: This table presents estimates when we trim the sample following Lee (2009) to account for selection from the decline in infant mortality following suffrage. In columns (1) and (3) we drop the top X% of completed education outcomes among the sample exposed to suffrage by age 1, where X is the percent change in mortality by South/non-South and race that we estimate in Appendix Table A.12. In columns (2) and (4) we drop the bottom X% of completed education outcomes among the sample exposed to suffrage by age 1. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. p<0.10, ** p<0.05, *** p<0.01.

Table A.14: Frequency of Growth in Local Real Schooling Revenues

|  | All | South | Non-South |
|---|---|---|---|
| Average number of year to year changes per city | 9.67 | 9.16 | 9.77 |
|  | (1.45) | (1.59) | (1.40) |
| *A: Revenues* |  |  |  |
| Average number of years tot. revenue grew by 5% | 3.57 | 3.29 | 3.63 |
|  | (1.19) | (1.13) | (1.20) |
| Average number of years tot. revenue grew by 10% | 3.33 | 3.09 | 3.38 |
|  | (1.20) | (1.12) | (1.21) |
| Average number of years tot. revenue grew by 25% | 2.62 | 2.50 | 2.64 |
|  | (1.12) | (1.13) | (1.12) |
| Share of years tot. revenue grew by 5% | 0.37 | 0.36 | 0.37 |
|  | (0.11) | (0.11) | (0.11) |
| Share of years tot. revenue grew by 10% | 0.34 | 0.34 | 0.34 |
|  | (0.11) | (0.11) | (0.11) |
| Share of years tot. revenue grew by 25% | 0.27 | 0.27 | 0.27 |
|  | (0.11) | (0.11) | (0.10) |
| Observations | 482 | 80 | 402 |
| *B: Revenues Per Pupil* |  |  |  |
| Average number of years tot. revenue per pupil grew by 5% | 3.647 | 3.325 | 3.711 |
|  | (1.19) | (1.20) | (1.17) |
| Average number of years tot. revenue per pupil grew by 10% | 3.402 | 3.013 | 3.480 |
|  | (1.17) | (1.15) | (1.16) |
| Average number of years tot. revenue per pupil grew by 25% | 2.668 | 2.425 | 2.716 |
|  | (1.09) | (1.17) | (1.07) |
| Share of years tot. revenue per pupil grew by 5% | 0.375 | 0.362 | 0.378 |
|  | (0.10) | (0.11) | (0.10) |
| Share of years tot. revenue per pupil grew by 10% | 0.350 | 0.328 | 0.355 |
|  | (0.11) | (0.11) | (0.10) |
| Share of years tot. revenue per pupil grew by 25% | 0.275 | 0.264 | 0.277 |
|  | (0.10) | (0.11) | (0.10) |
| Observations | 482 | 80 | 402 |

Notes: This table reports the average number of years that cities experience at least an x% growth in real revenue and real revenue per pupil over two consecutive years, where x takes values of 5, 15 and 25%. The sample consists of all cities with available expenditure, revenue and enrollment data, which we observe for at least 7 years, and which are not outliers. See sample restrictions in the notes of Table 5. Source: 1909 to 1911 and 1913 to 1915 Report of the Commissioner of Education, and 1917 to 1927 Biennial Survey of Education for cities with populations of 10,000 and over.

Table A.15: Effect of Suffrage on Log Expenditures and Enrollment –
Heterogeneity by Pre-Suffrage Education, Share Black, and South

| | Expenditures | | | Enrollment | | |
|---|---|---|---|---|---|---|
| | Pre-Ed | 1910 Black | South | Pre-Ed | 1910 Black | South |
| *Years Relative to Suffrage* | | | | | | |
| 5+ Years Prior | -0.261 | -0.071 | -0.074 | -0.206 | 0.019 | 0.014 |
| | (0.159) | (0.046) | (0.048) | (0.137) | (0.035) | (0.033) |
| 3-4 Years Prior | -0.142 | -0.015 | -0.017 | -0.137 | 0.008 | 0.011 |
| | (0.108) | (0.021) | (0.018) | (0.117) | (0.014) | (0.013) |
| 0-1 Years After | -0.070 | 0.042 | 0.041* | 0.102 | 0.024 | 0.022 |
| | (0.250) | (0.028) | (0.021) | (0.088) | (0.017) | (0.014) |
| 2-3 Years After | 0.448* | 0.109*** | 0.095*** | 0.305** | 0.015 | 0.014 |
| | (0.263) | (0.031) | (0.031) | (0.130) | (0.026) | (0.022) |
| 4-5 Years After | 0.542* | 0.128*** | 0.121*** | 0.473** | 0.004 | 0.010 |
| | (0.289) | (0.037) | (0.040) | (0.184) | (0.030) | (0.026) |
| 6+ Years After | 0.844** | 0.102** | 0.106** | 0.680*** | 0.001 | 0.010 |
| | (0.319) | (0.046) | (0.047) | (0.239) | (0.042) | (0.035) |
| eventyr1_x | 0.019 | -0.145 | -0.040 | 0.023 | -0.254* | -0.087* |
| | (0.018) | (0.196) | (0.066) | (0.016) | (0.129) | (0.049) |
| eventyr2_x | 0.013 | -0.110 | -0.034 | 0.015 | -0.153* | -0.064* |
| | (0.012) | (0.114) | (0.034) | (0.013) | (0.081) | (0.034) |
| eventyr4_x | 0.012 | -0.176 | -0.040 | -0.009 | 0.051 | 0.019 |
| | (0.028) | (0.215) | (0.065) | (0.010) | (0.089) | (0.022) |
| eventyr5_x | -0.038 | 0.120 | 0.064 | -0.031** | 0.300** | 0.095*** |
| | (0.028) | (0.276) | (0.074) | (0.014) | (0.136) | (0.031) |
| eventyr6_x | -0.045 | 0.212 | 0.093 | -0.050** | 0.476** | 0.154*** |
| | (0.031) | (0.336) | (0.078) | (0.020) | (0.192) | (0.045) |
| eventyr7_x | -0.080** | 0.385 | 0.149* | -0.072*** | 0.631** | 0.214*** |
| | (0.035) | (0.354) | (0.083) | (0.026) | (0.235) | (0.058) |
| Obs | 5183 | 2453 | 5183 | 5183 | 2453 | 5183 |
| Pre-X Mean | 8.93 | 0.08 | 0.19 | 8.93 | 0.08 | 0.19 |
| Pre-X 25th Pct | 8.83 | 0.01 | | 8.83 | 0.01 | |
| Pre-X 75th Pct | 9.35 | 0.09 | | 9.35 | 0.09 | |
| N Cities | 523 | 233 | 523 | 523 | 233 | 523 |
| N States | 42 | 37 | 42 | 42 | 37 | 42 |

Notes: This table contains results obtained when the dependent variables are log expenditures and log enrollment, and the independent variables of interest are academic years since suffrage interacted with one of our three measures of advantage: state-level pre-suffrage education levels (columns 1 and 4); city-level black share of the population (columns 2 and 5); and whether the city is located in the South (columns 3 and 6.) All regressions include controls for state-level characteristics, and city and academic year fixed effects. Estimates are weighted using city population in 1910, and standard errors are clustered on state. The sample consists of all cities with available expenditure, revenue and enrollment data, which we observe for at least 7 years, and which are not outliers. Source: 1909 to 1911 and 1913 to 1915 Report of the Commissioner of Education, and 1917 to 1927 Biennial Survey of Education for cities with populations of 10,000 and over. * p<0.10, ** p<0.05, *** p<0.01.

Table A.16: Relationship between County and White Education Expenditures –
Georgia and South Carolina

| | | | | |
|---|---|---|---|---|
| Expenditures, all schools | 0.945*** | | | |
| | (0.022) | | | |
| | | | | |
| – x Post-1920 | -0.055*** | | | |
| | (0.015) | | | |
| | | | | |
| Exp. per pupil, all schools | | 1.707*** | | |
| | | (0.173) | | |
| | | | | |
| – x Post-1920 | | -0.172 | | |
| | | (0.130) | | |
| | | | | |
| Ln Expenditures, all schools | | | 0.996*** | |
| | | | (0.038) | |
| | | | | |
| – x Post-1920 | | | 0.000 | |
| | | | (0.013) | |
| | | | | |
| Ln Exp. per pupil, all schools | | | | 0.963*** |
| | | | | (0.047) |
| | | | | |
| – x Post-1920 | | | | 0.034 |
| | | | | (0.031) |
| Mean Y | 306675.58 | 35.56 | 11.69 | 3.32 |
| N | 4154 | 4154 | 4154 | 4154 |

Notes: This table shows the within-county relationship between pre- and post-1920 local expenditures across all schools (column 1), expenditures per pupil (column 2), ln expenditures (column 3), and ln expenditures per pupil (column 4) and the corresponding measure for whites (e.g., total expenditures for white schools in column 1). Regressions include county and year fixed effects. Estimates weighted by total school enrollment in the county. Standard errors clustered on county shown in parenthesis. The sample is limited to Georgia and South Carolina, since those are the only states with available data before and after 1920 * p<0.10, ** p<0.05, *** p<0.01. Source: ICPSR data series: "County-level school enrollment and resources in ten segregated Southern states, 1910-1940"

## Table A.17: Relationship between County and Black Education Expenditures – Georgia and South Carolina

| | | | | |
|---|---|---|---|---|
| Expenditures, all schools | 0.034 | | | |
| | (0.024) | | | |
| – x Post-1920 | 0.069*** | | | |
| | (0.013) | | | |
| Exp. per pupil, all schools | | -0.067 | | |
| | | (0.064) | | |
| – x Post-1920 | | 0.199*** | | |
| | | (0.064) | | |
| Ln Expenditures, all schools | | | 0.433*** | |
| | | | (0.035) | |
| – x Post-1920 | | | 0.195*** | |
| | | | (0.042) | |
| Ln Exp. per pupil, all schools | | | | 0.348*** |
| | | | | (0.063) |
| – x Post-1920 | | | | 0.165** |
| | | | | (0.069) |
| Mean Y | 37212.79 | 5.99 | 9.53 | 1.48 |
| N | 4154 | 4154 | 4154 | 4154 |

Notes: This table shows the within-county relationship between pre- and post-1920 local expenditures across all schools (column 1), expenditures per pupil (column 2), ln expenditures (column 3), and ln expenditures per pupil (column 4) and the corresponding measure for blacks (e.g., total expenditures for black schools in column 1). Regressions include county and year fixed effects. Estimates weighted by total school enrollment in the county. Standard errors clustered on county shown in parenthesis. The sample is limited to Georgia and South Carolina, since those are the only states with available data before and after 1920 * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Source: ICPSR data series: "County-level school enrollment and resources in ten segregated Southern states, 1910-1940".

## Table A.18: Effect of Suffrage on Years of Education – Mandatory vs Voluntary States

|                                      | All       | Whites    | Blacks   |
|--------------------------------------|-----------|-----------|----------|
| *A: Interaction with Mandatory States* |           |           |          |
| Suff Share 0-15                      | 0.052     | 0.040     | 0.643*   |
|                                      | (0.199)   | (0.195)   | (0.356)  |
| Suff Share 0-15 x Mandatory States   | 0.321***  | 0.202     | 0.528**  |
|                                      | (0.105)   | (0.122)   | (0.221)  |
| Mean Education                       | 9.647     | 9.967     | 6.810    |
| Observations                         | 1555475   | 1393855   | 157028   |
| *B: Keep Voluntary States Only*      |           |           |          |
| Suff Share 0-15                      | -0.069    | -0.054    | 0.723**  |
|                                      | (0.206)   | (0.202)   | (0.330)  |
| Mean Education                       | 10.027    | 10.110    | 8.103    |
| Observations                         | 1220439   | 1169065   | 47218    |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variable is suffrage exposure, which is defined as the share of time between birth and age 15 that an individual was exposed to a suffrage law in his state of birth. In Panel A, suffrage exposure is interacted with indicators for "mandatory" and voluntary states, where "mandatory states" are the state that did not pass suffrage prior to the Nineteenth Amendment nor voluntarily ratified it. In Panel B, the sample is restricted to states that passed suffrage voluntarily as defined above. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. * p<0.10, ** p<0.05, *** p<0.01.

## Table A.19: Effect of Suffrage on Years of Education – By Whether Individual Migrated From State of Birth

|                | Whites  |            |         | Blacks    |            |         |
|----------------|---------|------------|---------|-----------|------------|---------|
|                | All     | Non Movers | Movers  | All       | Non Movers | Movers  |
| Suff Share 0-15 | 0.062   | 0.006      | 0.215   | 0.884***  | 1.342***   | 0.485   |
|                | (0.197) | (0.199)    | (0.170) | (0.295)   | (0.483)    | (0.501) |
| Mean Education | 9.967   | 9.743      | 10.447  | 6.810     | 6.320      | 7.505   |
| Observations   | 1393855 | 949891     | 443964  | 157028    | 92760      | 64268   |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variable is suffrage exposure, which is defined as the share of time between birth and age 15 that an individual was exposed to a suffrage law in his state of birth. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. * p<0.10, ** p<0.05, *** p<0.01.

## Table A.20: Effect of Suffrage on Years of Education – Sensitivity to Census

|  | 1940 | 1950 | 1960 | 1950, 1940 Pop | 1960, 1940 Pop |
|---|---|---|---|---|---|
| *A: Blacks* |  |  |  |  |  |
| Suff Share 0-15 | 0.234 | 1.530** | 0.957** | 2.892** | 1.191** |
|  | (0.296) | (0.693) | (0.389) | (1.349) | (0.505) |
| Mean Education | 6.009 | 6.984 | 7.272 | 6.426 | 6.502 |
| Observations | 61004 | 22447 | 73577 | 15839 | 50924 |
| *B: Whites* |  |  |  |  |  |
| Suff Share 0-15 | 0.084 | 0.231 | -0.064 | 0.229 | -0.046 |
|  | (0.178) | (0.231) | (0.205) | (0.207) | (0.211) |
| Mean Education | 9.567 | 10.056 | 10.173 | 9.704 | 9.735 |
| Observations | 509583 | 204510 | 679762 | 148663 | 483804 |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variable is suffrage exposure, which is defined as the share of time between birth and age 15 that an individual was exposed to a suffrage law in his state of birth. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

## Table A.21: Effect of Suffrage on Years of Education – Keep Early States

|  | All | Whites | Blacks | Whites Males | Whites Females | Blacks Males | Blacks Females |
|---|---|---|---|---|---|---|---|
| Suff Share 0-15 | 0.122 | 0.091 | 0.926*** | 0.088 | 0.091 | 1.372* | 0.560** |
|  | (0.189) | (0.182) | (0.295) | (0.180) | (0.200) | (0.699) | (0.265) |
| Mean Education | 9.671 | 9.987 | 6.813 | 9.873 | 10.097 | 6.403 | 7.175 |
| R-Squared | 0.195 | 0.125 | 0.215 | 0.135 | 0.116 | 0.208 | 0.213 |
| Observations | 1581878 | 1419943 | 157155 | 701079 | 718864 | 74410 | 82745 |

Notes: The sample includes all states, including those that passed suffrage prior to 1900. Suff Share 0-15 is defined as the share of time between birth and age 15 that suffrage law passed in an individual's state of birth. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. Source: 1940-1960 decennial censuses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

## Table A.22: Effect of Suffrage on Years of Education – Individuals 25 or Older Only

|  | All | Whites | Blacks | Whites | | Blacks | |
|---|---|---|---|---|---|---|---|
|  |  |  |  | Males | Females | Males | Females |
| Suff Share 0-15 | 0.091 | 0.051 | 1.044*** | 0.014 | 0.085 | 1.564** | 0.586* |
|  | (0.207) | (0.201) | (0.266) | (0.196) | (0.225) | (0.685) | (0.325) |
| Mean Education | 9.568 | 9.888 | 6.706 | 9.777 | 9.995 | 6.320 | 7.048 |
| R-Squared | 0.192 | 0.122 | 0.213 | 0.133 | 0.112 | 0.207 | 0.210 |
| Observations | 1424162 | 1276966 | 143098 | 629908 | 647058 | 67855 | 75243 |

Notes: The sample excludes states that passed suffrage prior to 1900, and is composed of individuals age $\geq 25$. Suff Share 0-15 is defined as the share of time between birth and age 15 that suffrage law passed in an individual's state of birth. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. Source: 1940-1960 decennial censuses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

## Table A.23: Effect of Suffrage on Years of Education – Sensitivity to Measure of Exposure

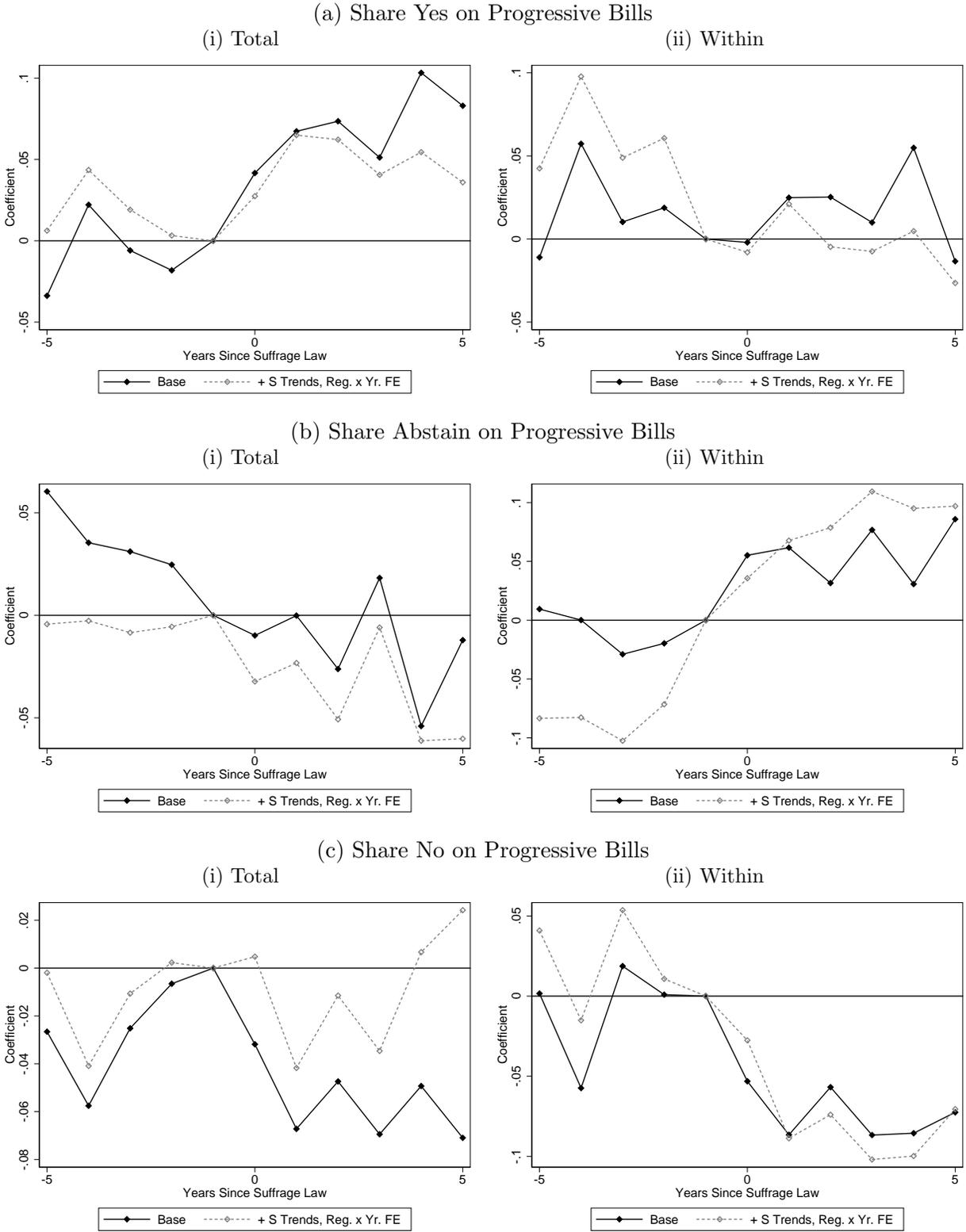|  | All | Whites | Blacks |
|---|---|---|---|
| Suffrage by 15 | 0.009 | -0.001 | 0.292*** |
|  | (0.021) | (0.022) | (0.060) |
| Mean Education | 9.647 | 9.967 | 6.810 |
| Observations | 1555475 | 1393855 | 157028 |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variable is suffrage exposure, which is equal to one if an individual is exposed to suffrage in his state of birth at age 15 or younger. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A.24: Effect of Suffrage on Years of Education – Sensitivity to State Controls

|  | All | Whites | Blacks |
|---|---|---|---|
| *A: Baseline: State Controls At Birth* | | | |
| Suff Share 0-15 | 0.091 | 0.062 | 0.884*** |
|  | (0.203) | (0.197) | (0.295) |
| *B: Substitute Cumulative State Controls 0-15* | | | |
| Suff Share 0-15 | 0.150 | 0.128 | 0.875*** |
|  | (0.181) | (0.172) | (0.300) |
| *C: Substitute Pre-State Controls\*Birthyear* | | | |
| Suff Share 0-15 | 0.046 | 0.004 | 1.034*** |
|  | (0.253) | (0.239) | (0.246) |
| *D: Drop Controls for Compulsory Schooling* | | | |
| Suff Share 0-15 | 0.089 | 0.059 | 0.862*** |
|  | (0.197) | (0.196) | (0.302) |
| *E: Dynamic Controls for Compulsory Schooling* | | | |
| Suff Share 0-15 | 0.073 | 0.036 | 0.805*** |
|  | (0.200) | (0.189) | (0.289) |
| *F: Add Controls for Progressive Laws* | | | |
| Suff Share 0-15 | 0.064 | 0.033 | 0.994*** |
|  | (0.206) | (0.201) | (0.265) |
| *G: Add Trend in Pre-Education* | | | |
| Suff Share 0-15 | 0.097 | 0.062 | 0.884*** |
|  | (0.202) | (0.197) | (0.295) |
| *H: Drop States with Rosenwald Schools* | | | |
| Suff Share 0-15 | -0.066 | -0.066 | 1.476*** |
|  | (0.193) | (0.193) | (0.345) |

Notes: This table contains results obtained when the dependent variable is years of education and the main independent variable is suffrage exposure, which is defined as the share of time between birth and age 15 that an individual was exposed to a suffrage law in his state of birth. Each panel and column presents estimates from separate regressions. Each panel title refers to a separate robustness exercise, see text for details. Panel E reports results where we include a control for the relevant compulsory schooling law at each age, from age 1 to 18. All regressions include controls for demographics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses. * p<0.10, ** p<0.05, *** p<0.01.

Figure A.1: Effect of Suffrage on Presidential Turnout
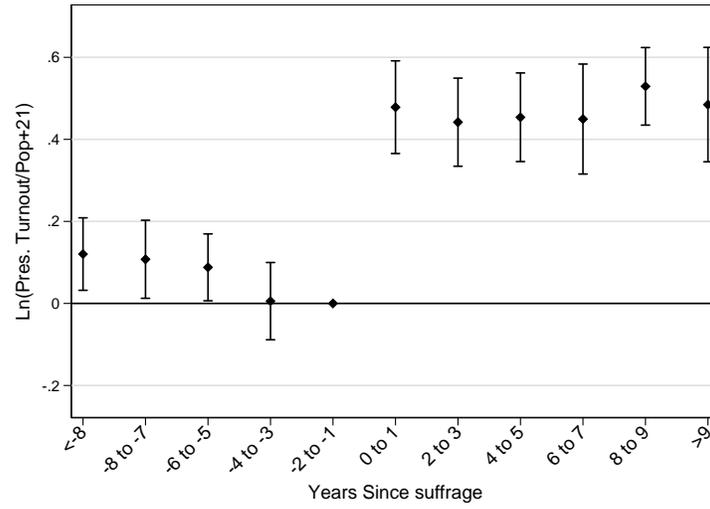


Notes: This figure plots the estimated coefficients obtained from an event study specification that analyzes the effect of suffrage on state-level presidential turnout, defined as the natural logarithm of total number of votes at the presidential elections divided by the voting eligible age, 21+. We control for state and year fixed effects, weight the estimates using population weights, and cluster the standard errors at the state level. The two years prior to the passage of suffrage are the omitted category, so estimates are relative to that point. The sample excludes states that passed suffrage prior to 1900. Sources: Turnout: "Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972" (ICPSR 8611); Population: 1900-1930 censuses.

# Figure A.2: Voting on Progressive Bills After Suffrage – Total and Within-Politicians

## (a) Share Yes on Progressive Bills

### (i) Total

### (ii) Within



## (b) Share Abstain on Progressive Bills

### (i) Total

### (ii) Within



## (c) Share No on Progressive Bills

### (i) Total

### (ii) Within



These figures are obtained from event study specifications that analyze the effect of suffrage on (i) the share of progressive bills that a senator voted for; (ii) the share of progressive bills that a senator abstained from; and (iii) the share of progressive bills that the senator voted against. The "Within" panels includes individual fixed effects, while the "Total" panels do not. "Base" specification in black diamonds includes year fixed effects and state fixed effects. Wee add state trends and region-by-year fixed effects as a robustness check, shown with the grey open diamonds. Event study coefficients are relative to t=-1. We group together the years t≥5 and t≤-5, shown at the end-points. Standard errors are clustered at the state level. Sources: Coding of progressive and anti-progressive bills from Miller (2008), 1900–1930 Senate voting data from Voteview: Congressional Roll Call Votes Database (Lewis et al., 2019).

Figure A.3: Average Educational Attainment Across Cohorts and Regions
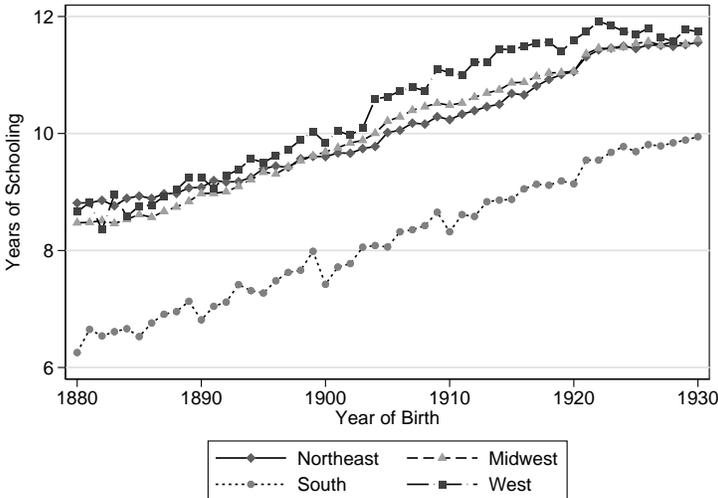


Notes: This figure plots the (weighted) average number of years of completed schooling for U.S. born residents by birth cohort and region. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

Figure A.4: Relationship between Subgroup Effect of Suffrage on Years of Education and Pre-Suffrage Average Disadvantage
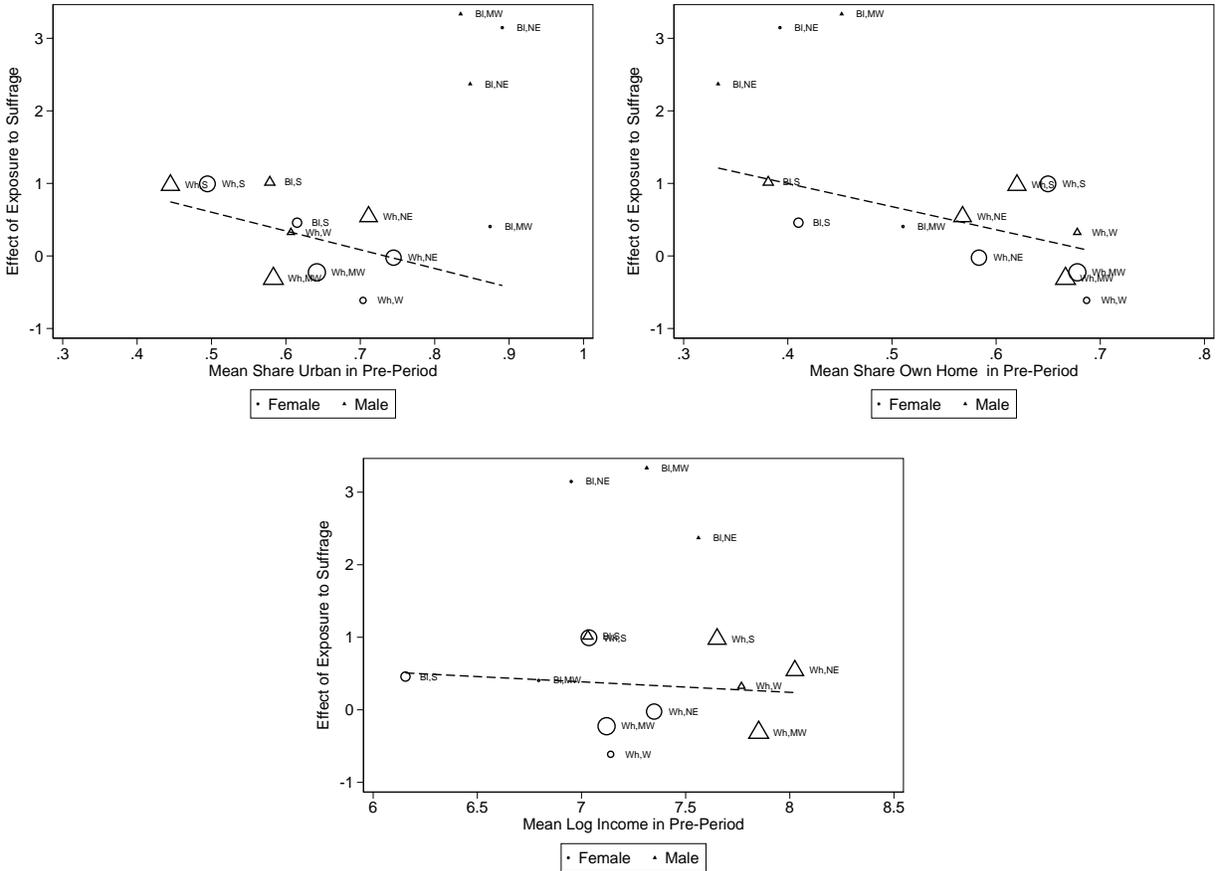


Notes: To create these figures, we first estimate specifications that analyze the effect of suffrage exposure on educational attainment separately for demographic groups defined according to region of birth, race and gender. We then plot the estimated coefficients along with the three different average pre-suffrage measure of disadvantage for each demographic group, with the circle/triangle size representing the number of observations in each group. Regions are abbreviated as follows: "S" for South, "W" for West, "MW" for Midwest, and "NE" for Northeast, and race is abbreviated as: "Bl" for black and "Wh" for white. We do not show blacks in the West due to their small sample size, but an equivalent figure that includes all groups is available on request. All regressions include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

Figure A.5: Effect of Suffrage at Each Age of Exposure on Years of Education –
By South/Non-South
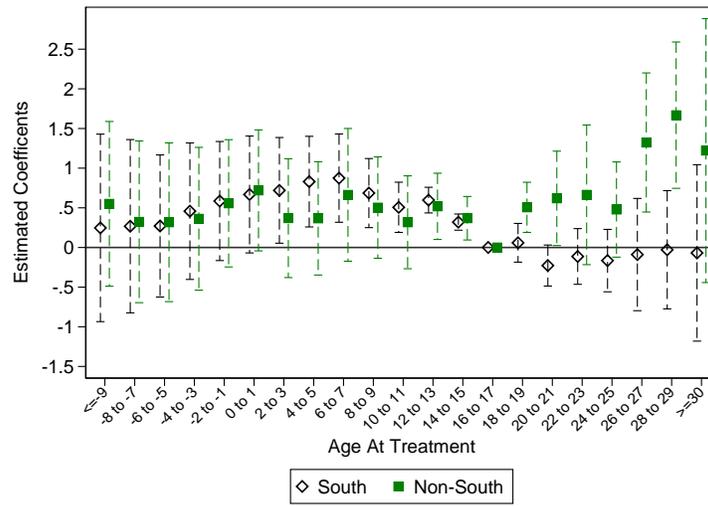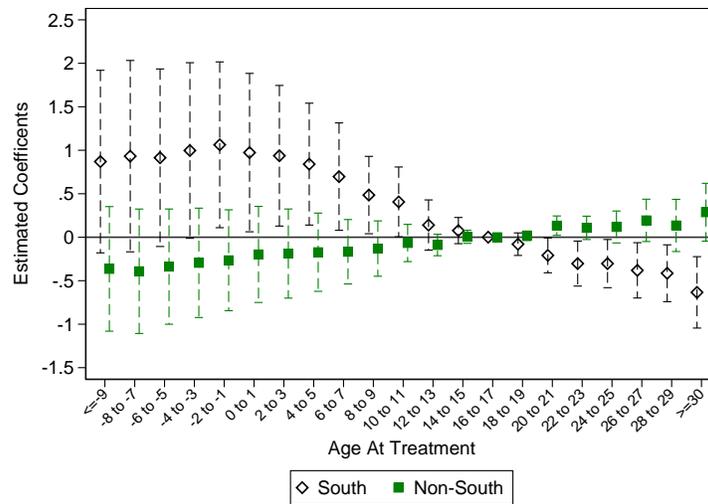


(a) Blacks



(b) Whites

Notes: This figure plots the estimated coefficients (and 95% confidence intervals) ob-
tained from event study specifications that analyze the effect of suffrage at each age of
first exposure on educational attainment and includes an interaction between the age
at treatment dummies and whether the state of birth is in the South or Non-South,
estimated separately for whites and blacks. All specifications include controls for de-
mographics and state-level characteristics, birth state and birth year fixed effects, birth
state linear time trends, as well as region-by-birth year and census year-by-birth year
fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative
to that point. Estimates are weighted using Census sample weights, and standard errors
are clustered on the state of birth. The sample consists of individuals born between
1880 and 1930, and that are at least 20 years old at the time of observation. We exclude
states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

Figure A.6: Effect of Suffrage at Each Age of Exposure on Literacy –
By Race
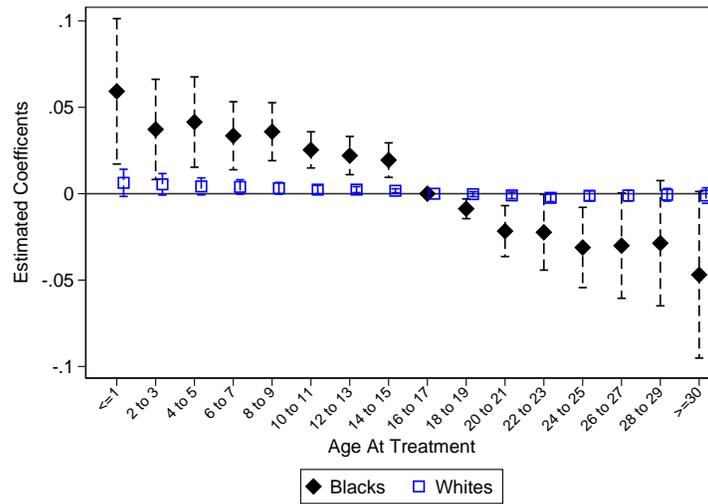


Notes: This figure plots the estimated coefficients (and 95% confidence intervals) obtained from event study specifications that analyze the effect of suffrage at each age of first exposure on literacy attainment, separately for whites and blacks. All specifications include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative to that point. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1915, and that are at least 15 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1920-1930 decennial censuses.

Figure A.7: Effect of Suffrage at Each Age of First Exposure on Log Earnings –
By South/Non-South
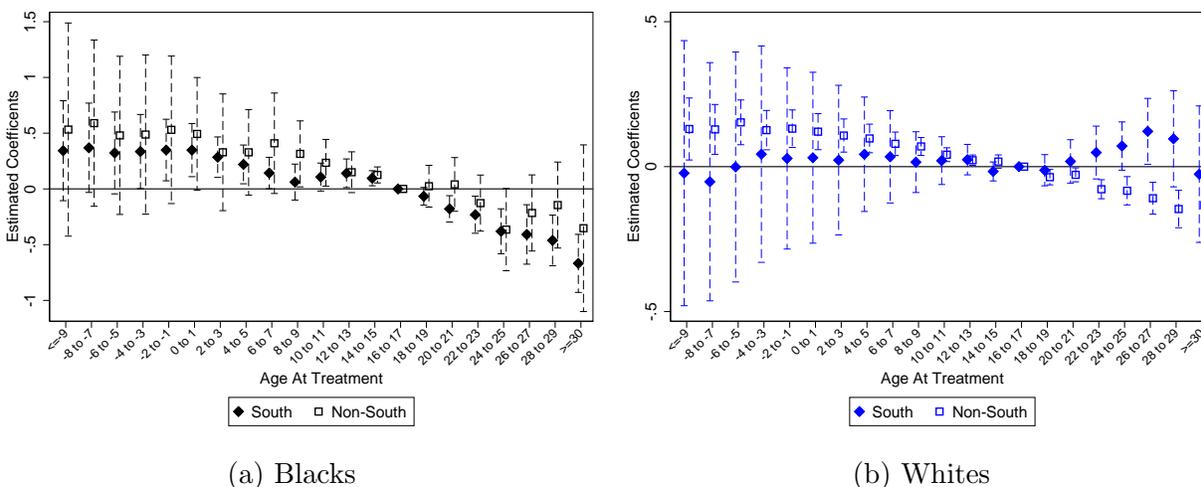


(a) Blacks

(b) Whites

Notes: This figure plots the estimated coefficients (and 95% confidence intervals) obtained from event study specifications that analyze the effect of suffrage at each age of first exposure on log income, and includes an interaction between the age at treatment dummies and whether the state of birth is in the South or Non-South, estimated separately for whites and blacks. All specifications include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative to that point. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at between 30 and 65 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

Figure A.8: Distributional Effects of Exposure to Suffrage (Ages 0–15) on Earnings –
By South/Non-South

(a) Whites

(i) South

(ii) Non-South

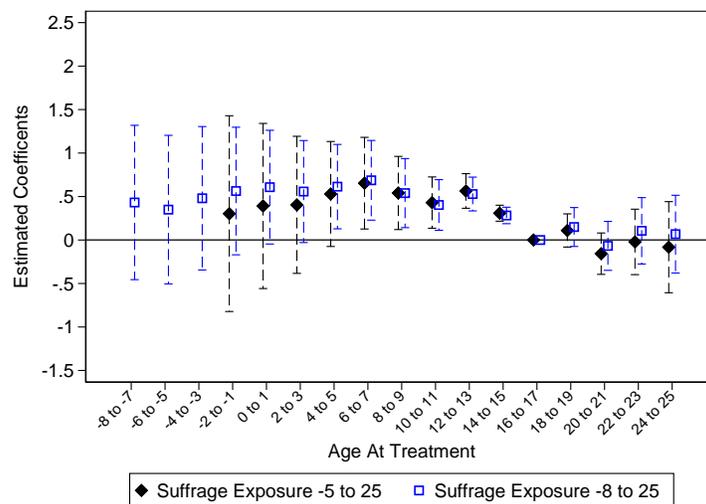(b) Blacks

(i) South

(ii) Non-South
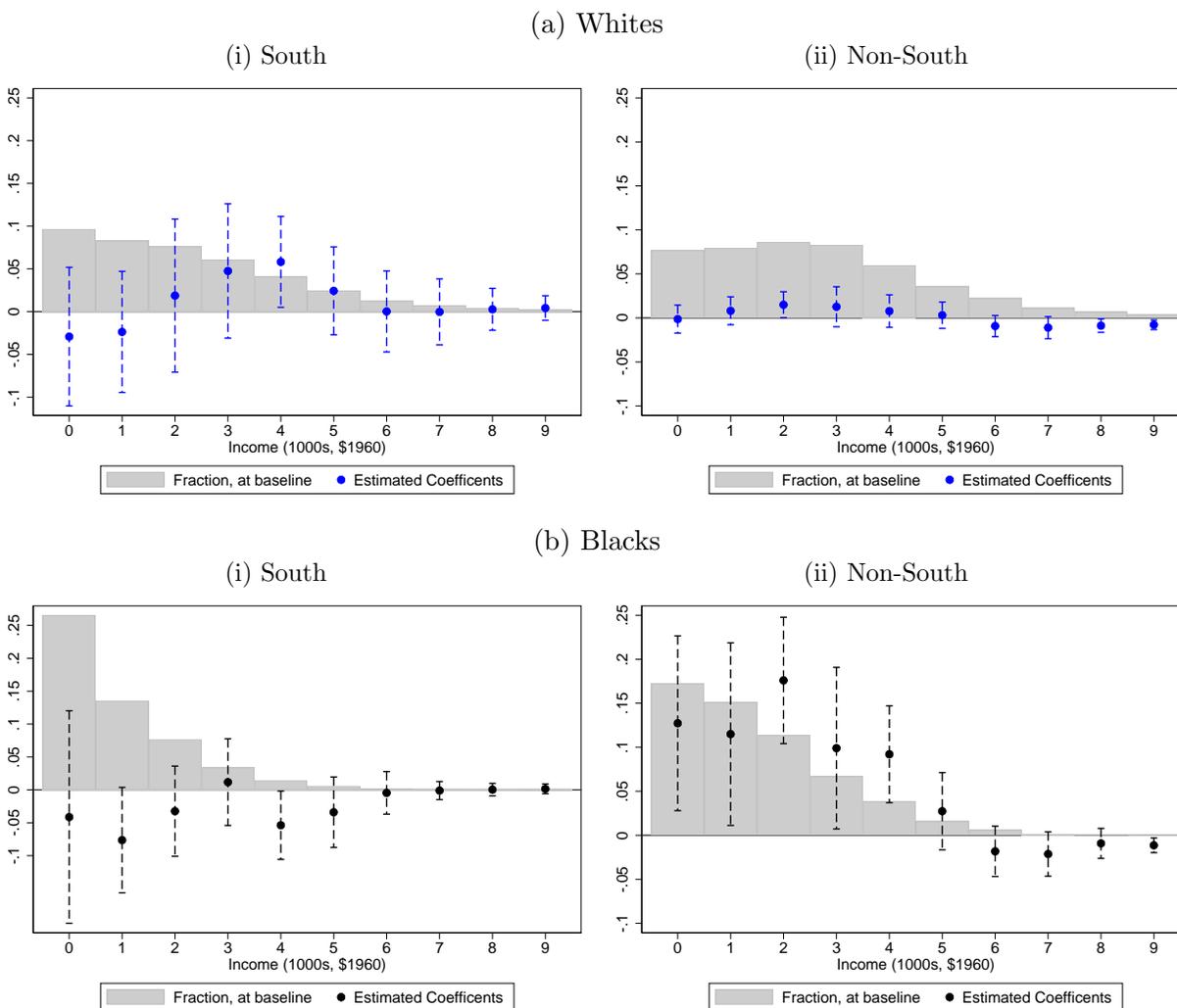
Notes: These figures plot the estimated coefficients (and 95% confidence intervals) from a series of regressions of indicators for whether an individual had earnings ($1960 at least as great as $x$, where $x$ is represented on the x-axis, on suffrage exposure between ages 0–15. Regressions are estimated separately for white and blacks and by south/non-south, and they include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. For reference, we also include a histogram of the earnings of individuals who were exposed to suffrage after age 15, who serve as the comparison group in these regressions. The sample consists of individuals born between 1880 and 1930, and that are between the ages of 30–60 at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

Figure A.9: Effect of Placebo Suffrage Laws on Years of Education – By Race



(a) Blacks                                        (b) Whites
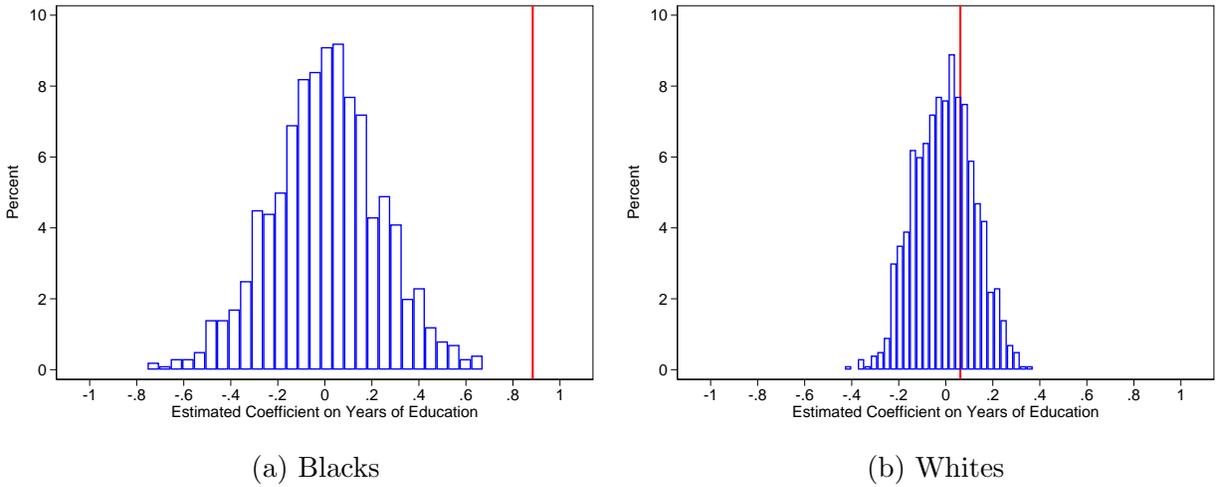
Notes: These figures plot the distribution of the estimated difference-in-differences coefficients on suffrage exposure obtained from 1000 repetitions where we randomly assign a year of suffrage between 1910 and 1920 to each state. The red line indicates the estimated effect when we use the real suffrage laws. The empirical p-value for blacks is $< 0.01$ and for whites is 0.31. All specifications include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Estimates are weighted using Census sample weights. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

Figure A.10: Effect of Suffrage at Each Age of First Exposure on Years of Education –
Sensitivity To Different Age of First Exposure Windows, Blacks



Notes: This figure plots the estimated coefficients (and 95% confidence intervals) obtained from event study specifications that analyze the effect of suffrage at each age of first exposure on educational attainment, estimated for blacks only separately for cohorts exposed to suffrage between -5 and 25 and between -8 and 25. All specifications include controls for demographics and state-level characteristics, birth state and birth year fixed effects, birth state linear time trends, as well as region-by-birth year and census year-by-birth year fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative to that point. Estimates are weighted using Census sample weights, and standard errors are clustered on the state of birth. The sample consists of individuals born between 1880 and 1930, and that are at least 20 years old at the time of observation. We exclude states that passed suffrage prior to 1900. Source: 1940-1960 decennial censuses.

# B    Appendix B: Data Appendix

**Voter Turnout**    We obtain the number of votes cast in each presidential election for our analysis of voter turnout in Section 1.1 from the ICPSR data series #8611: "Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840–1972" (Clubb, Flanigan and Zingale, 2006). We estimate the population over age 21 using decennial census data (Ruggles et al., 2020), with linear interpolation for the intercensal years.

**State Controls**    We source these measures from the data set used in Lleras-Muney (2002) and provided in Lleras-Muney (2014, 2020) as well as from ICPSR data series #2896 "Historical, Demographic, Economic, and Social Data: The United States, 1790–2002" (Haines and Inter-university Consortium for Political and Social Research, 2010). The data from Lleras-Muney (2002) span the years 1915-1939 and have been utilized in many previous studies of this time period, such as Goldin and Katz (2010). We use ICPSR #2896, which harmonizes information from the Censuses of Manufacturing and Agriculture, to create an equivalent set of controls to Lleras-Muney (2002) that spans from 1880-1914. We linearly interpolate between decennial census observations to create annual measures.[1] Finally, we use the 1870–1930 decennial censuses to generate estimates of literacy at birth for each state and cohort (Ruggles et al., 2020).

**Compulsory Schooling**    We use data on compulsory schooling requirements from 1910 to 1913 used in Goldin and Katz (2003*b*), and from 1914 to 1944 used in Acemoglu and Angrist (2000).[2] We then determine the relevant schooling and labor laws for each cohort following the assignment rules in Stephens and Yang (2014*a*). In particular, the measure of compulsory attendance, $CA$ is defined for each cohort $c$ born in state $s$ as follows:
$CA_{cs} = min\{DropoutAge_{cs} - EnrollmentAge_{cs}, Years\ of\ SchoolNeeded\ to\ Dropout_{cs}\}$, where each of the components of $CA$ are determined by the prevailing laws in state $s$ in the year that $c$ turns 14. The measure of compulsory schooling required for child labor, $CL_{cs}$ is defined as: $CL_{cs} = max\{WorkPermitAge_{cs} - EnrollmentAge_{cs}, EducationforWorkPermit_{cs}\}$. Since we only have these laws beginning in 1910, we assume that cohorts that turned 14 before 1910 (born between 1880-1896) were exposed to the 1910 laws.

**Rosenwald Initiative**    We aggregate the county-level Rosenwald student exposure measure used in Aaronson and Mazumder (2011*b*) and provided in Aaronson and Mazumder (2011*a*) to the state level to generate an individual measure of Rosenwald exposure in one's state of birth.

**Progressive Laws and New Deal Spending**    We hand-coded the years of progressive laws that appear in Appendix Table A.5 based on Tables 6, 8 and 10 of Skocpol (1992), Table

---

[1]Following Lleras-Muney (2002), we adjust all monetary values for inflation using the Consumer Price Index, 1982-1984 as the base period.

[2]For the data used in Acemoglu and Angrist (2000), we use the Stata dataset "schooling_laws_aa" provided in Stephens and Yang (2014*b*). For the data used in Goldin and Katz (2003*b*), we use the data provided in Goldin and Katz (2003*a*).

1 of Kantor and Fishback (1996), and Table 1 of Depew, Edwards and Owens (2013). We obtain information on New Deal Spending used in Table A.6 from the data used in Fishback, Haines and Kantor (2007*a*), and provided in Fishback, Haines and Kantor (2007*b*).

**Mortality Statistics**   We obtained pdf files of the 1900 to 1932 *Mortality Statistics* (originally published by the Census) from the Centers for Disease Control and Prevention website (U.S. Bureau of the Census, n.d.). We used optical character recognition (OCR) to convert the pdfs to Excel files and a research assistant manually checked the values.

**City-level Education Data**   During our period of interest, city-level education statistics were published either in the Report of the Commissioner of Education (annually, academic years 1909/10 until 1915/16) or in the Biennial Survey of Education (biennially, from 1917/18 on). We downloaded pdfs for nearly all of the years we digitized, 1906 to 1911 and 1913 to 1928, from the HathiTrust Digital Library (U.S. Department/Bureau of Education, 1868-1916; U.S. Department of the Interior, Bureau/Office of Education, 1917-1928).[3] The one exception is that for 1923/24, we scanned the volume ourselves for better image quality. We selected three tables to digitize in each year: the school census, which has enrollment and attendance; the "receipts of school systems", which contains sources of revenue; and the expenses and outlays table, which has total current expenditures. We digitized this information for all cities with populations over 10,000 using an external digitization service.

To obtain our final city panel data, we first harmonized the naming conventions across years by manually looking for cases where the name changed very slightly across years (e.g., "Windham (P. O. Willimantic)" became "Windham (P. O., Willimantic)"). Second, we manually identified cities that merged or split, and generated consistent names for these cities. Third, since the reporting categories for local revenue (city and county) varied across years, we aggregated these to create a comparable measure over time. We define revenue from local sources as total revenue minus revenue from the state.

**Congressional Voting**   We draw on Congressional roll call data from Voteview (Lewis et al., 2019) and the coding of progressive bills used in Miller (2008*b*) and provided in Miller (2008*a*) for our analysis of voting in the Senate in Section 1.1.[4] The final data include all votes by legislators in the Senate and the House of Representatives from 1900 to 1930, and indicators for whether the bill voted on was "progressive" or "anti-progressive." Following Miller (2008*b*), we consider voting "no" on an anti-progressive bill or "yes" on a progressive bill to be a "progressive" vote. To be as inclusive as possible, we also consider votes on bills coded as "questionably progressive" or "questionably anti-progressive" as "progressive" and "anti-progressive," respectively.

**County-level Education Expenditures**   To estimate the "pass-through" of growth in county spending to black and white schools, we use a panel of county-level education expen-

---

[3]The original pdfs can be accessed from Hathitrust (https://www.hathitrust.org/) with a Hathitrust subscription.

[4]To download the Voteview data, go to the Voteview website, then click on "Download Data Type," and then click on "Member Ideology" (for the list of members) or "Members' Votes" (for legislators' votes).

ditures for Georgia and South Carolina from 1910 to 1940 we use the data from Carruthers and Wanamaker (2014) provided in Carruthers and Wanamaker (2019).[5] Expenditure data are available for South Carolina for every academic year, and for Georgia for every academic year between 1910–1922 and for every other academic year between 1922–1940. The data include information on expenditures for white schools, black schools, and total expenditures.[6] We compute expenditures per pupil by dividing total expenditures by enrollment.

---

[5]The data also include race-specific school spending for Louisiana and Arkansas, but for a shorter period (from 1922–1940 for Louisiana, and every other year from 1928–1940 for Arkansas.)

[6]Total expenditures are frequently larger than the sum of expenditures for white and black schools, which could represent administrative costs.

# References

**Aaronson, Daniel, and Bhashkar Mazumder.** 2011*a*. "Data for: The Impact of Rosenwald Schools on Black Achievement." *https: // doi. org/ 10. 1086/ 662962*, Accessed in 2014.

**Aaronson, Daniel, and Bhashkar Mazumder.** 2011*b*. "The Impact of Rosenwald Schools on Black Achievement." *Journal of Political Economy*, 119(5): 821–888.

**Acemoglu, Daron, and Joshua Angrist.** 2000. "How Large are Human-Capital Externalities? Evidence from Compulsory-Schooling Laws." *NBER Macroeconomics Annual 2000*, 15: 9–74.

**Carruthers, Celeste K., and Marianne H. Wanamaker.** 2014. "Municipal Housekeeping: The Impact of Women's Suffrage on the Provision of Public Education." *Journal of Human Resources*.

**Carruthers, Celeste K., and Marianne H. Wanamaker.** 2019. "County-level School Enrollment and Resources in Ten Segregated Southern States, 1910-1940." *https: // doi. org/ 10. 3886/ E109625V1-43532*.

**Clubb, Jerome M., William H. Flanigan, and Nancy H. Zingale.** 2006. "Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972." *https: // doi. org/ 10. 3886/ ICPSR08611. v1*.

**Depew, Briggs, Griffin Edwards, and Emily Owens.** 2013. "Alcohol Prohibition and Infant Mortality." Mimeo.

**Fishback, Price V., Michael R. Haines, and Shawn Kantor.** 2007*a*. "Births, Deaths, and New Deal Relief during the Great Depression." *Review of Economics and Statistics*, 89(1): 1–14.

**Fishback, Price V., Michael R. Haines, and Shawn Kantor.** 2007*b*. "Data for: Births, Deaths, and New Deal Relief during the Great Depression." *http: // www. u. arizona. edu/ ~fishback/ Published_ Research_ Datasets. html*, Accessed in 2017.

**Goldin, Claudia, and Lawrence F. Katz.** 2010. *The Race between Education and Technology.* Cambridge, Mass.:Belknap Press.

**Goldin, Claudia, and Lawrence Katz.** 2003*a*. "Data for: Mass Secondary Schooling and the State." *https: // scholar. harvard. edu/ goldin/ pages/ data*, Accessed in 2017.

**Goldin, Claudia, and Lawrence Katz.** 2003*b*. "Mass Secondary Schooling and the State." National Bureau of Economic Research Working Paper 10075.

**Haines, Michael R., and Inter-university Consortium for Political and Social Research.** 2010. "Historical, Demographic, Economic, and Social Data: The United States, 1790-2002." *https: // doi. org/ 10. 3886/ ICPSR02896. v3*.

**Kantor, Shawn Everett, and Price V. Fishback.** 1996. "Precautionary Saving, Insurance, and the Origins of Workers' Compensation." *Journal of Political Economy*, 104: 419–442.

**Lee, David S.** 2009. "Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects." *The Review of Economic Studies*, 76(3): 1071–1102.

**Lewis, Jeffrey B., Keith Poole, Howard Rosenthal, Adam Boche, Aaron Rudkin, and Luke Sonne.** 2019. "Voteview: Congressional Roll-Call Votes Database." *https://voteview.com/data*.

**Lleras-Muney, Adriana.** 2002. "Were Compulsory Attendance and Child Labor Laws Effective? An Analysis from 1915 to 1939." *Journal of Law and Economics*, 45(2): 401–35.

**Lleras-Muney, Adriana.** 2014. "Data for: Were Compulsory Attendance and Child Labor Laws Effective? An Analysis from 1915 to 1939." *http://www.econ.ucla.edu/alleras/research/data.html*, Accessed in 2014 (defunct).

**Lleras-Muney, Adriana.** 2020. "Personal Website, Data." *https://adrianallerasmuney.squarespace.com/data*, Accessed: 2020-08-05.

**Lott, John R., and Lawrence W. Kenny.** 1999. "Did Women's Suffrage Change the Size and Scope of Government?" *Journal of Political Economy*, 107(6): 1163–1198.

**Miller, Grant.** 2008*a*. "Data for: Women's Suffrage, Political Responsiveness, and Child Survival in American History." *https://ngmiller.people.stanford.edu/research*, Accessed 08-01-2019.

**Miller, Grant.** 2008*b*. "Women's Suffrage, Political Responsiveness, and Child Survival in American History." *The Quarterly Journal of Economics*, 123(3): 1287–1327.

**Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, , and Matthew Sobek.** 2020. " Integrated Public Use Microdata Series: Version 10.0 [Machine-readable database]."

**Skocpol, Theda.** 1992. *Protecting Soldiers and Mothers: The Political Origins of Social Policy in United States.* Harvard:Belknap Press.

**Stephens, Jr., Melvin, and Dou-Yan Yang.** 2014*a*. "Compulsory Education and the Benefits of Schooling." *American Economic Review*, 104(6): 1777–92.

**Stephens, Jr., Melvin, and Dou-Yan Yang.** 2014*b*. "Data for: Compulsory Education and the Benefits of Schooling." *https://doi.org/10.3886/E112828V1*, Accessed in 2017.

**U.S. Bureau of the Census.** n.d.. "Vital Statistics of the United States: 1890-1938." *https://www.cdc.gov/nchs/products/vsus/vsus_1890_1938.htm*, Accessed on 2014-06-14.

**U.S. Department/Bureau of Education.** 1868-1916. "Report of the Commissioner of Education." *// catalog. hathitrust. org/ Record/ 009164574* .

**U.S. Department of the Interior, Bureau/Office of Education.** 1917-1928. "Biennial Survey of Education." *// catalog. hathitrust. org/ Record/ 100886319* .