

Supplement to:

Sutton, April, Bernardo Mackenna, Bolun Zhang, and Amanda Bosky. 2026. “The Exception to Women’s Advantage: How Rurality, Red Counties, and the Local Economy Shape Gender Gaps in Educational Attainment” *Sociological Science* 13: 712-746.

## Appendix B

### Proximity to College Measures

We obtained college addresses from the Integrated Postsecondary Education Data System (IPEDS) 2002/03 and used Google's Geocoding Application Programming Interfaces (API) to determine the longitude and latitude coordinates for each university address and the center of each student's zip code area. We then calculated the distance between every U.S. baccalaureate degree granting institution and students' residential zip code.

Our measure of *the number of four-year colleges within commuting distance* follows that designed by López Turley (2009). We constructed thresholds for all students in the sample based on the median distance between the residential zip code areas and first college choice among those to which they applied. Like López Turley (2009), this calculation is based upon the applications of students who think it is "important" or "somewhat important" to live close to home during college. We apply different thresholds for students across urbanicity classifications based on the median distance we calculated for each urbanicity classification. For example, the median distance is about 11 miles among city youth compared with 53 miles among rural students. According to these calculated thresholds, we then count the number of 4-year colleges that lie within the threshold distance from the center coordinates of each student's zip code area.

We construct our measure of the *travel time to nearest four-year public college* using both Google's Geocoding API and Distance Matrix API (for commuting travel time).

**Table B1. Log Odds Coefficients from Weighted Logistic Regressions Predicting Youth's BA Attainment, Fully Interacted by Gender**

	City		Suburban		Rural	
Women (ref: men)	-1.034	(1.438)	-0.416	(0.908)	-2.744	(1.435)
<i>Income (ref: &lt;35k)</i>						
\$35k-\$50k	0.194	(0.273)	0.126	(0.232)	0.664	(0.337)
\$50k-\$75k	0.129	(0.279)	0.161	(0.220)	0.421	(0.289)
\$75-100k	0.435	(0.302)	0.384	(0.228)	0.528	(0.386)
> \$100k	0.398	(0.323)	0.450	(0.231)	0.543	(0.429)
Women X \$35k-\$50k	0.035	(0.362)	0.012	(0.305)	-1.085*	(0.428)
Women X \$50k-\$75k	0.100	(0.378)	0.131	(0.299)	-0.795*	(0.372)
Women X \$75-100k	-0.008	(0.484)	0.113	(0.285)	-0.774	(0.595)
Women X > \$100k	0.332	(0.420)	0.091	(0.304)	-0.082	(0.565)
<i>Mother's Education (ref: no college)</i>						
Some College	-0.250	(0.257)	-0.001	(0.232)	-0.292	(0.323)
Bachelor's Degree	0.027	(0.213)	-0.017	(0.158)	0.700*	(0.271)
Advanced Degree	0.258	(0.299)	0.378	(0.236)	0.113	(0.483)
Women X Some College	-0.026	(0.395)	0.123	(0.315)	-0.113	(0.509)
Women X Bachelor's Degree	0.311	(0.329)	0.051	(0.217)	-0.633	(0.403)
Women X Advanced Degree	0.468	(0.440)	-0.236	(0.328)	1.148	(0.682)
<i>Father's Education (ref: no college)</i>						
Some College	0.144	(0.329)	-0.023	(0.202)	-0.456	(0.423)
Bachelor's Degree	0.924***	(0.252)	0.391*	(0.194)	1.003**	(0.334)
Advanced Degree	0.701*	(0.271)	0.292	(0.232)	0.888	(0.527)
Women X Some College	0.841*	(0.410)	0.030	(0.285)	0.750	(0.563)
Women X Bachelor's Degree	-0.249	(0.341)	-0.063	(0.239)	-0.514	(0.400)
Women X Advanced Degree	-0.418	(0.365)	0.334	(0.304)	-0.430	(0.654)
<i>Lives with both biological parents</i>						
Women X Lives with both biological parents	-0.156	(0.182)	0.031	(0.152)	0.277	(0.268)
	0.095	(0.239)	0.007	(0.211)	0.339	(0.320)
<i>Age by end of 2004 (ref: &lt;19 years old)</i>						
Women X Age	-0.004	(0.193)	-0.016	(0.123)	-0.409	(0.238)
	-0.048	(0.253)	-0.332	(0.180)	0.217	(0.317)
<i>Ethnoracial Background (ref: non-Hispanic white)</i>						
NH Black	0.094	(0.268)	-0.016	(0.123)	1.301**	(0.484)
Hispanic	-0.023	(0.282)	0.393	(0.299)	-0.715	(0.767)
Asian American/Pacific Islander	0.515*	(0.236)	0.117	(0.267)	0.068	(0.777)
Other	-0.135	(0.381)	0.517*	(0.248)	0.524	(0.419)
Women X NH Black	0.001	(0.366)	0.043	(0.360)	-0.399	(0.604)
Women X Hispanic	0.024	(0.347)	-0.382	(0.321)	0.764	(0.879)
Women X Asian American/Pacific Islander	-0.351	(0.313)	-0.700*	(0.329)	0.621	(0.764)
Women X Other	0.154	(0.513)	-0.754*	(0.380)	0.304	(0.690)
<i>Transferred high schools b/w base-year and 1st follow-up</i>						
Women X Transfer	-0.383	(0.320)	-0.132	(0.291)	0.262	(0.523)
	-0.282	(0.467)	0.082	(0.344)	-0.648	(0.656)
<i>Parental Religious Affiliation</i>						
Baptist	0.048	(0.356)	0.015	(0.236)	-0.622	(0.366)
Other Christian affiliation	-0.136	(0.288)	0.132	(0.184)	-0.360	(0.300)
Other/No Religious affiliation	-0.377	(0.329)	-0.320	(0.264)	-0.036	(0.439)
Women X Baptist	0.321	(0.447)	-0.797*	(0.311)	0.713	(0.517)
Women X Other Christian affiliation	0.278	(0.392)	-0.417	(0.255)	-0.016	(0.440)
Women X Other/No Religious affiliation	0.446	(0.425)	0.120	(0.359)	-0.235	(0.639)
10th Grade Math Item Response Theory (IRT) Score	0.003	(0.010)	0.007	(0.008)	0.016	(0.015)
Women X 10th Grade Math IRT Score	0.011	(0.013)	-0.001	(0.011)	0.014	(0.020)
High School Academic Grade Point Average	1.378***	(0.196)	1.558***	(0.148)	1.641***	(0.265)
Women X High School Academic Grade Point Average	-0.002	(0.324)	0.024	(0.200)	0.160	(0.387)
<i>Region (ref: Northeast)</i>						
Midwest	-0.897**	(0.272)	-0.151	(0.205)	-0.369	(0.407)
South	-0.383	(0.263)	-0.494*	(0.226)	-0.347	(0.440)
West	-1.129***	(0.284)	-0.769**	(0.279)	-0.819	(0.431)
Women X Midwest	0.050	(0.405)	0.148	(0.261)	-0.273	(0.401)
Women X South	-0.211	(0.374)	0.271	(0.285)	-0.570	(0.466)
Women X West	0.490	(0.429)	0.676*	(0.330)	-0.157	(0.499)

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**Table B1, cont. Log Odds Coefficients from Weighted Logistic Regressions Predicting Youth's BA Attainment, Fully Interacted by Gender**

	City		Suburban		Rural	
Academic Disengagement	-0.303*	(0.127)	-0.071	(0.126)	-0.079	(0.133)
Women X Academic Disengagement	0.251	(0.177)	-0.015	(0.118)	0.147	(0.182)
Behavioral Disengagement	-0.159	(0.139)	-0.018	(0.096)	-0.326	(0.186)
Women X Behavioral Disengagement	-0.083	(0.194)	0.218	(0.164)	0.629*	(0.266)
<b>Math Coursetaking Pipeline (ref: Less than Algebra II)</b>						
Algebra II	1.170**	(0.353)	0.740**	(0.253)	0.705	(0.406)
Advanced Math (e.g., trigonometry)	1.093**	(0.374)	0.843***	(0.244)	1.168**	(0.409)
Pre-calculus	1.674***	(0.379)	1.034***	(0.270)	1.111**	(0.408)
Calculus	1.442***	(0.420)	1.236***	(0.308)	1.031*	(0.474)
Women X Algebra II	-0.701	(0.477)	0.120	(0.364)	-0.318	(0.507)
Women X Advanced Math	-0.375	(0.484)	0.247	(0.343)	-0.057	(0.549)
Women X Pre-calculus	-0.668	(0.482)	0.253	(0.388)	0.196	(0.601)
Women X Calculus	0.052	(0.563)	0.032	(0.427)	-0.186	(0.609)
<b>Science Coursetaking Pipeline (less than General Biology)</b>						
General Biology	0.359	(0.271)	0.115	(0.192)	0.560	(0.304)
Chemistry 1 or Physics 1	0.658*	(0.290)	0.730***	(0.208)	0.723*	(0.333)
Chemistry 1 and Physics 1	0.983*	(0.439)	0.651*	(0.252)	0.605	(0.396)
Chem 2 or Physics 2 or Advanced Biology	0.931*	(0.390)	0.486	(0.276)	0.761	(0.507)
Women X General Biology	0.246	(0.375)	0.250	(0.255)	-0.287	(0.420)
Women X Chemistry 1 or Physics 1	0.047	(0.415)	-0.021	(0.288)	-0.284	(0.484)
Women X Chemistry 1 and Physics 1	-0.087	(0.535)	-0.341	(0.312)	0.105	(0.516)
Women X Chem 2 or Physics 2 or Adv. Biology	0.158	(0.564)	0.372	(0.397)	-0.156	(0.700)
Offers one AP/IB course (ref: no AP/IB courses)	-0.516	(0.464)	0.539	(0.292)	0.046	(0.384)
Offers at least two AP/IB course (ref: no AP/IB courses)	-0.108	(0.368)	0.660**	(0.239)	-0.556	(0.332)
Women X Offers one AP/IB course	0.313	(0.620)	-0.312	(0.419)	0.695	(0.484)
Women X Offers two or more AP/IB courses	0.361	(0.536)	0.057	(0.338)	0.843*	(0.398)
School Socioeconomic Composition	0.492	(0.288)	0.530*	(0.206)	1.231**	(0.465)
Women X School Socioeconomic Composition	-0.544	(0.417)	-0.030	(0.268)	-0.788	(0.608)
<b>School Type (ref: public)</b>						
Catholic	0.149	(0.244)	0.412	(0.257)	0.244	(0.931)
Private	0.213	(0.352)	0.084	(0.208)	-0.554	(0.663)
Women X Catholic	0.556	(0.366)	-0.153	(0.316)	-0.338	(1.148)
Women X Private	-0.023	(0.422)	0.002	(0.328)	0.581	(0.580)
Constant	-4.892***	(0.973)	-7.067***	(0.707)	-6.443***	(1.040)
Observations	3,960		5,900		2,090	

SOURCES: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002/2012) and Integrated Postsecondary Education Data System (IPEDS), 2002-03; U.S. Census 2000; MIT Election Data and Science Lab, Election Returns 2000.

NOTES: Models estimated separately for students attending city, suburban, and rural high schools and are fully interacted by gender.

Sample sizes are unweighted and rounded to nearest 10 per NCES guidelines.

Robust standard errors in parentheses. \*\*\*p<0.001, \*\* p<0.01, \*p<0.05 (two-tailed tests).

**Table B2. Log Odds Coefficients from Weighted Logistic Regressions Predicting Rural Youth's BA Attainment, Fully Interacted by Gender**

	Local Context		GPA		Education & Non-Cognitive Measures	
Women (ref: men)	-1.918	(1.871)	-1.046	(1.993)	-4.192	(2.177)
County proportion of voters who cast ballot for President Bush in 2000	0.011	(0.011)	0.016	(0.014)	0.011	(0.016)
Women X County proportion of voters who cast ballot for President Bush in 2000	-0.035*	(0.015)	-0.043*	(0.019)	-0.045*	(0.020)
County % Employed in Higher-Status Professional Occupations	0.016	(0.065)	0.062	(0.084)	0.025	(0.089)
Women X County % Employed in Higher-Status Professional Occupations	0.194*	(0.098)	0.088	(0.107)	0.051	(0.116)
Gender Composition of Higher-Status Professional Occupational Workers (prop. Women)	1.503	(1.510)	0.657	(1.629)	0.562	(1.629)
Women X Gender Composition of Higher-Status Professional Occupational Workers (prop. Women)	0.055	(1.609)	-0.376	(1.774)	-0.125	(1.742)
% County Employed in Agricultural/Craft/Lower-Manual Occupations	-0.016	(0.018)	-0.018	(0.019)	-0.005	(0.022)
Women X % County Employed in Agricultural/Lower-Manual Occupations	0.039	(0.022)	0.029	(0.022)	0.025	(0.026)
County number of Evangelical adherents per 1000	0.000	(0.001)	-0.000	(0.001)	-0.000	(0.001)
Women X County number of Evangelical adherents per 1000	-0.001	(0.001)	0.000	(0.001)	-0.001	(0.001)
Travel time to nearest 4-year public college	-0.001	(0.002)	-0.001	(0.003)	-0.000	(0.003)
Women X Travel time to nearest 4-year public college	0.006	(0.003)	0.004	(0.004)	0.005	(0.004)
# of 4-year colleges within commuting distance	0.022*	(0.009)	0.022	(0.013)	0.024	(0.014)
Women X # of 4-year colleges within commuting distance	-0.020	(0.014)	-0.020	(0.015)	-0.028	(0.016)
% County Unemployed	-0.073	(0.083)	-0.103	(0.104)	-0.014	(0.111)
Women X % County Unemployed	-0.079	(0.103)	-0.065	(0.119)	-0.093	(0.130)
County % Hispanic	-1.631	(1.525)	-4.237**	(1.524)	-2.241	(1.782)
Women X County % Hispanic	-1.521	(2.460)	2.186	(2.411)	0.614	(2.873)
County % White	-1.812*	(0.908)	-2.514**	(0.953)	-2.428*	(1.006)
Women X County % White	2.381*	(1.129)	3.234**	(1.198)	3.605**	(1.254)
<i>Region (ref: Northeast)</i>						
Midwest	0.317	(0.336)	-0.142	(0.382)	-0.123	(0.452)
South	-0.054	(0.449)	-0.428	(0.481)	-0.383	(0.537)
West	0.146	(0.449)	-0.468	(0.483)	-0.617	(0.547)
Women X Midwest	-0.765*	(0.336)	-0.763	(0.396)	-0.335	(0.478)
Women X South	-0.308	(0.471)	-0.326	(0.483)	0.099	(0.603)
Women X West	-0.521	(0.472)	-0.347	(0.480)	-0.128	(0.602)
10th Grade Math Item Response Theory (IRT) Score	0.089***	(0.012)	0.038**	(0.014)	0.017	(0.015)
Women X 10th Grade Math IRT Score	0.018	(0.015)	0.008	(0.018)	0.017	(0.020)
High School Academic Grade Point Average			2.152***	(0.243)	1.728***	(0.261)
Women X High School Academic Grade Point Average			-0.188	(0.367)	0.091	(0.387)
<i>Income (ref: &lt;35k)</i>						
\$35k-\$50k	0.408	(0.311)	0.593	(0.355)	0.677	(0.346)
\$50k-\$75k	0.366	(0.242)	0.495	(0.267)	0.396	(0.289)
\$75-100k	0.291	(0.372)	0.538	(0.386)	0.544	(0.388)
>\$100k	0.407	(0.433)	0.631	(0.474)	0.520	(0.451)
Women X \$35k-\$50k	-0.654	(0.391)	-0.987*	(0.439)	-1.089*	(0.445)
Women X \$50k-\$75k	-0.449	(0.340)	-0.665	(0.365)	-0.715	(0.369)
Women X \$75-100k	-0.153	(0.538)	-0.478	(0.585)	-0.710	(0.589)
Women X >\$100k	0.447	(0.531)	0.176	(0.571)	-0.022	(0.604)
<i>Mother's Education (ref: no college)</i>						
Some College	0.115	(0.331)	-0.196	(0.364)	-0.290	(0.353)
Bachelor's Degree	0.813**	(0.248)	0.752**	(0.246)	0.695*	(0.272)
Advanced Degree	0.578	(0.360)	0.232	(0.438)	0.115	(0.482)
Women X Some College	-0.465	(0.437)	-0.116	(0.505)	-0.093	(0.529)
Women X Bachelor's Degree	-0.710	(0.360)	-0.531	(0.386)	-0.575	(0.404)
Women X Advanced Degree	0.280	(0.536)	0.941	(0.638)	1.140	(0.674)
<i>Father's Education (ref: no college)</i>						
Some College	-0.121	(0.412)	-0.247	(0.482)	-0.363	(0.459)
Bachelor's Degree	1.075***	(0.298)	1.144***	(0.306)	1.004**	(0.336)
Advanced Degree	1.170**	(0.356)	1.011*	(0.456)	0.960	(0.522)
Women X Some College	0.487	(0.522)	0.579	(0.611)	0.619	(0.593)
Women X Bachelor's Degree	-0.470	(0.386)	-0.632	(0.395)	-0.558	(0.420)
Women X Advanced Degree	-0.502	(0.478)	-0.539	(0.593)	-0.547	(0.654)
<i>Lives with both biological parents</i>						
Women X Lives with both biological parents	0.433	(0.243)	0.178	(0.266)	0.275	(0.285)
	0.172	(0.262)	0.349	(0.307)	0.371	(0.334)
<i>Age by end of 2004 (ref: &lt;19 years old)</i>						
Women X Age	-0.470*	(0.206)	-0.427	(0.227)	-0.380	(0.234)
	0.241	(0.279)	0.297	(0.300)	0.192	(0.306)
<i>Ethnoracial Background (ref: non-Hispanic white)</i>						
NH Black	0.788	(0.405)	1.206*	(0.497)	0.942	(0.521)
Hispanic	-1.065	(0.841)	-0.671	(0.932)	-0.882	(0.862)
Asian American/Pacific Islander	0.018	(0.773)	0.002	(0.912)	-0.203	(0.993)
Other	-0.119	(0.362)	0.192	(0.441)	0.328	(0.466)
Women X NH Black	-0.259	(0.516)	-0.358	(0.609)	-0.028	(0.664)
Women X Hispanic	1.231	(0.939)	0.917	(1.017)	1.100	(0.968)
Women X Asian American/Pacific Islander	1.176	(0.838)	0.852	(0.890)	0.900	(0.950)
Women X Other	0.803	(0.510)	0.500	(0.660)	0.425	(0.718)
<i>Transferred high schools b/w base-year and 1st follow-up</i>						
Women X Transfer	-0.446	(0.487)	-0.136	(0.478)	0.249	(0.511)
	-0.198	(0.628)	-0.166	(0.615)	-0.643	(0.647)

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**Table B2, continued. Log Odds Coefficients from Weighted Logistic Regressions Predicting Rural Youth's BA Attainment, Fully Interacted by Gender**

	Local Context		GPA		Education & Non-Cognitive Measures	
<i>Lives with both biological parents</i>	0.433	(0.243)	0.178	(0.266)	0.275	(0.285)
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Women X Asian American/Pacific Islander	1.176	(0.838)	0.852	(0.890)	0.900	(0.950)
Women X Other	0.803	(0.510)	0.500	(0.660)	0.425	(0.718)
<i>Transferred high schools b/w base-year and 1st follow-up</i>	-0.446	(0.487)	-0.136	(0.478)	0.249	(0.511)
Women X Transfer	-0.198	(0.628)	-0.166	(0.615)	-0.643	(0.647)
<i>Parental Religious Affiliation</i>						
Baptist	-0.600	(0.329)	-0.540	(0.359)	-0.610	(0.370)
Other Christian affiliation	-0.365	(0.277)	-0.373	(0.289)	-0.375	(0.315)
Other/No Religious affiliation	-0.222	(0.359)	-0.111	(0.435)	0.012	(0.444)
Women X Baptist	0.650	(0.484)	0.686	(0.504)	0.825	(0.532)
Women X Other Christian affiliation	0.060	(0.405)	-0.002	(0.427)	0.086	(0.458)
Women X Other/No Religious affiliation	-0.035	(0.550)	-0.059	(0.649)	-0.178	(0.676)
<i>School Type (ref: public)</i>						
Catholic					0.165	(1.076)
Private					-0.947	(0.755)
Women X Catholic					-0.407	(1.445)
Women X Private					0.891	(0.681)
Academic Disengagement					-0.062	(0.139)
Women X Academic Disengagement					0.155	(0.191)
Behavioral Disengagement					-0.332	(0.199)
Women X Behavioral Disengagement					0.612*	(0.262)
<u>Math Coursetaking Pipeline (ref: Less than Algebra II)</u>						
Algebra II					0.708	(0.392)
Advanced Math (e.g., trigonometry)					1.093**	(0.386)
Pre-calculus					0.974*	(0.401)
Calculus					0.922*	(0.461)
Women X Algebra II					-0.249	(0.499)
Women X Advanced Math					0.034	(0.546)
Women X Pre-calculus					0.296	(0.612)
Women X Calculus					-0.035	(0.638)
<i>Science Coursetaking Pipeline (less than General Biology)</i>						
General Biology					0.667*	(0.300)
Chemistry 1 or Physics 1					0.866*	(0.364)
Chemistry 1 and Physics 1					0.810*	(0.387)
Chem 2 or Physics 2 or Advanced Biology					0.992	(0.551)
Women X General Biology					-0.357	(0.441)
Women X Chemistry 1 or Physics 1					-0.299	(0.512)
Women X Chemistry 1 and Physics 1					-0.111	(0.520)
Women X Chem 2 or Physics 2 or Adv. Biology					-0.353	(0.764)
Offers one AP/IB course (ref: no AP/IB courses)					0.241	(0.382)
Offers at least two AP/IB course (ref: no AP/IB courses)					-0.427	(0.314)
Women X Offers one AP/IB course					0.687	(0.451)
Women X Offers two or more AP/IB courses					0.868*	(0.350)
<i>School Socioeconomic Composition</i>						
Women X School Socioeconomic Composition					1.121*	(0.560)
Constant	-4.164**	(1.452)	-7.123***	(1.581)	-5.629**	(1.700)

SOURCES: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002/2012) and Integrated Postsecondary Education Data System (IPEDS), 2002-03; U.S. Census 2000; MIT Election Data and Science Lab, Election Returns 2000.

NOTES: Observations=2,090 (unweighted, rounded to the nearest 10 per NCES guidelines).

Robust standard errors in parentheses. \*\*\*p<0.001, \*\* p<0.01, \*p<0.05 (two-tailed tests).