Table 1. Mutual Same Grade, Same Gender Friends by Maternal Education and by Racial Groups

	No. of Friends (1)	Share Same Group (2)	Group Share (3)		No. of Friends (4)	Share Same Group (5)	Group Share (6)
Maternal Education				Race			
Female				Female			
High School Dropout	0.889	23.1%	12.4%	White	1.298	87.7%	54.7%
High School Graduate	1.167	53.6%	46.1%	Black	0.880	80.6%	18.5%
College Graduate	1.295	42.1%	24.5%	Hispanic	0.789	55.4%	16.9%
Missing	0.793	19.2%	17.0%	Other	0.955	39.4%	9.9%
Male				Male			
High School Dropout	0.516	17.7%	9.1%	White	0.839	85.0%	55.0%
High School Graduate	0.726	49.9%	42.6%	Black	0.446	73.8%	15.9%
College Graduate	0.860	45.6%	26.3%	Hispanic	0.457	49.5%	17.6%
Missing	0.464	22.4%	22.0%	Other	0.621	39.8%	11.5%

Notes: A mutual friend tie is defined as a two-way nomination of friendship. The "No. of friends" columns present the mean of the number of mutual friends of each type by gender. The "Share Same Group" columns present the mean of the percentage of mutual friends the students have from the same maternal education or racial group as their own. For example, the 87.7% in column (5) shows that, on average, 87.7% of a white student's mutual friends are also white. Column (3) and (6) provide the distribution of students by maternal education and by racial groups. The full sample size is 87,006.

Table 2. Summary Statistics

Number of Maternal College Friends	None		One or More	
	Mean (1)	Std Dev (2)	Mean (3)	Std Dev (4)
Panel 1. Student Outcomes				
GPA	2.723	0.810	3.095	0.724
Number Maternal College Friends	0.000	0.000	2.229	1.058
Number Maternal No HS Friends	0.080	0.306	0.072	0.267
Panel 2. Demographics used for Predicting Friendships				
Male	0.523	0.499	0.422	0.494
White	0.513	0.500	0.689	0.463
Black	0.184	0.387	0.124	0.330
Hispanic	0.220	0.414	0.085	0.279
Other	0.107	0.309	0.108	0.310
Mom No High School Degree	0.122	0.327	0.051	0.220
Mom High School Graduate	0.444	0.497	0.442	0.500
Mom College Graduate	0.218	0.412	0.396	0.489
Mom Education Missing	0.216	0.416	0.111	0.314
Panel 3. Demographics used for Testing Balance				
Student Age	14.962	1.981	14.809	1.662
No. of People in Household	4.119	1.450	4.240	1.064
No. of School Kids in Household	0.965	0.967	0.647	0.832
Live with Both Parents	0.667	0.471	0.813	0.390
Live with Biological Parents	0.901	0.298	0.966	0.181
Mother's Education in Years	10.291	5.812	14.145	2.147
Mother Born in US	0.696	0.460	0.865	0.342
Student Born in US	0.864	0.343	0.938	0.242
Student Adopted	0.032	0.134	0.022	0.148
Health Condition at Birth	0.018	0.134	0.018	0.132
Panel 4. School District Attributes				
School Percent White Students	0.532	0.305	0.616	0.274
School Percent Maternal College	0.240	0.115	0.309	0.159
School Size (1000's)	1.149	0.641	1.377	0.653
Sample Size	69,500		17,506	

Notes. The table presents means and standard deviations of the variable listed for the entire sample. Columns 1 and 2 present these statistics for the subsample of individuals who no friends based on mutually reported links whose mothers have at least a four year college degree. Columns 3 and 4 present results for the subsample of individuals who have one or more maternal college friends. The sample size row shows the regression sample for which GPA is observed.

Table 3. Balancing Test for Cohort Composition Sorting with Student Characteristics

Panel 1. Balancing Tests on Cohort Composition

Independent Variables	%Black (1)	%Hispanic (2)	%Other (3)	%Mom College Graduate (4)	%Mom HS Dropout (5)
F-test	0.826	0.545	1.564	0.917	1.002
P-value	0.604	0.855	0.124	0.520	0.445
R-squared with FE's	0.97498	0.97569	0.91323	0.89760	0.88766
Within R-squared	0.0008	0.0004	0.0003	0.0003	0.0003
Sample Size	87,006	87,006	87,006	87,006	87,006

Panel 2. Balancing Tests on Predicted Number of Friends

	Female		Male	
Independent Variables	Mom College Graduate (1)	Mom No High School (2)	Mom College Graduate (3)	Mom No High School (4)
F-test	0.977	0.875	0.548	1.010
P-value	0.469	0.560	0.851	0.442
R-squared within FE's	0.96171	0.94284	0.97691	0.89273
Within R-squared	0.0005	0.0007	0.0009	0.0009
Sample Size	37,621	37,621	36,219	36,219

Panel 3. Balancing Tests on Actual Number of Friends

	Female		Male	
Independent Variables	Mom College Graduate	Mom No High School	Mom College Graduate	Mom No High School
F-test	11.78	3.741	9.094	3.060
P-value	0.0000	0.0003	0.0000	0.0023
R-squared within FE's	0.19510	0.11159	0.17616	0.09350
Within R-squared	0.0093	0.0027	0.0068	0.0019
Sample Size	43,306	43,306	43,700	43,700

Notes. Panel 1 presents the results for a balancing test where the cohort share of a subgroup is regressed on student demographics listed in panel 3 of Table 2. The models control for actual school (high school or middle school) by demographic type based on the variables in panel 1 of Table 2, and are estimated using the entire sample of students with valid friendship information to estimate this traditional cohort study balancing test. Panel 2 presents the results for a balancing test regression predicted number of friends on the same demographics controlling for student type by school district and cohort by school district fixed effects plus a control function to address the omission of cohort from friendship predictions following our grade point average model specification and using our sample of students where we observe grade point average. Panel 3 presents the same balancing tests for actual number of friends using the full sample and not omit the control function created for the predicted friendship variables. In all models, demographic variables are set to zero when missing and a dummy for missingness is included for that variable. Then, an F-test is conducted on the demographic controls.

Table 4. Effect of Friendships on Student's Grade Point Average (GPA)

	Female GPA				Male GPA			
	First Stage	OLS	IV1	IV2	First Stage	OLS	IV1	IV2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No. of Friends with Mom College	0.859**	0.156**	0.204**		0.808**	0.152**	0.032	
	(0.068)	(0.010)	(0.057)		(0.083)	(0.013)	(0.152)	
No. of Friends with Mom No High School	0.632**	-0.011		0.024	0.635**	-0.036		0.171
	(0.100)	(0.013)		(0.196)	(0.092)	(0.023)		(0.196)
Sample Size	43306	37621	37621	37621	43700	36219	36219	36219
First Stage F-stat of IV			106.711	41.556			96.507	31.651
First Stage R-squared			0.221	0.150			0.205	0.141
OLS/IV R-squared		0.229	0.062	0.046		0.216	0.041	0.033
Type*School District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grade*School District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Omit Cohort Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Std. Dev. of Actual No. of Friends with College Grad Maternal Education			0.655				0.566	

Notes: Columns (1) and (5) show the coefficients from the first stage regression of the 2SLS, which is regressing actual number of friends on the predicted number of friends for "Friends with Mom college Graduate" and "Friends with Mom No High School" separately. The predicted number of friends is generated by summing up the predicted probability of being friends from estimation using the pair level friendship link sample for each student over all potential friends of a certain type (e.g. maternal college education). The R-squared and F-statistic from first stage are presented under columns (3), (4), (7) and (8). Each column among (2) to (4) and (6) to (8) displays a separate regression of GPA on number of mutual friends with college graduate mothers and/or with high school dropout mothers. Columns (2) and 6) present the OLS estimates while the other columns present IV estimates. The numbers of mutual friends are instrumented with corresponding predicted number of friends from the friendship link model. All regressions control for school-student type and school district-cohort/grade fixed effects, and models are estimated separately by gender. IV regressions include a control for the omission of the student's own cohort information from predicted friendship patterns in both first and second stage. All standard errors are clustered at the school level. **p<0.01 and *p<0.05.

Table 5. Robustness Tests

	Panel 1. Maternal Education Missing		
	Baseline	Drop if Missing	If Missing use Dad
	(1)	(2)	(3)
Female: Friends with	0.204**	0.219**	0.281**
Mom College Graduate	(0.057)	(0.062)	(0.089)
Female: Friends with	0.022	0.082	-0.002
Mom HS Dropout	(0.196)	(0.278)	(0.253)
Male: Friends with	0.032	0.089	0.120
Mom College Graduate	(0.151)	(0.141)	(0.172)
Male: Friends with	0.172	0.063	-0.249
Mom HS Dropout	(0.196)	(0.230)	(0.175)
	Panel 2. Alternative Fixed Effects Structures		
	Triple Difference	Non-Native	Live w/ Both Parents
Female: Friends with	0.193**	0.231**	0.207**
Mom College Graduate	(0.062)	(0.058)	(0.064)
Female: Friends with	0.072	0.071	0.131
Mom HS Dropout	(0.190)	(0.166)	(0.147)
Male: Friends with	0.014	-0.024	-0.088
Mom College Graduate	(0.129)	(0.142)	(0.166)
Male: Friends with	0.195	0.005	-0.051
Mom HS Dropout	(0.186)	(0.120)	(0.170)
	Panel 3. Different Types of Friendships		
	One Way Referrals	High School Only	Paternal Education
Female: Friends with	0.102**	0.280**	0.124
Mom College Graduate	(0.025)	(0.070)	(0.075)
Female: Friends with	-0.030	-0.064	0.744
Mom HS Dropout	(0.090)	(0.278)	(0.553)
Male: Friends with	0.017	0.081	0.139
Mom College Graduate	(0.062)	(0.196)	(0.185)
Male: Friends with	-0.011	0.359	-0.024
Mom HS Dropout	(0.088)	(0.289)	(0.170)

Notes. See notes for Table 4. Table 5 Panel 1 contains estimates that address concerns that maternal education is missing for a substantial fraction of the sample. Column (1) replicates the estimates from Table 4, column (2) presents estimates dropping individuals who did not report their maternal education, and and column (3) presents estimates where maternal education is replaced with paternal education when maternal education is missing. Panel 2 presents estimates using different fixed effect structures. Column (1) presents estimates using based on adding a vector of fixed effects for student type by cohort fixed effects, Column (2) presents estimates expanding the student type by school district so that student type includes whether the student born in the U.S. or not, and Column (3) presents estimates expanding the student type by school district so that student type includes whether the student lives with both parents or not. All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Table 6. Effect of Friendships allowing for Heterogeneous Peer Effects

	Female				Male		
	OLS	IV1	IV2		OLS	IV1	IV2
	(1)	(2)	(3)		(4)	(5)	(6)
No. of Friends with	0.156**	0.234**			0.153**	0.043	
Mom College	(0.010)	(0.059)			(0.013)	(0.149)	
No. of Friends with	-0.011		0.041		-0.035		0.213
Mom HS Dropout	(0.013)		(0.199)		(0.023)		(0.198)
Share maternal college*	0.075	0.049	0.132		-0.600	-0.568	-0.547
Maternal College	(0.193)	(0.183)	(0.216)		(0.306)	(0.306)	(0.293)
Share maternal college*	0.112	0.131	0.107		0.036	0.022	-0.023
Maternal HS Dropout	(0.307)	(0.303)	(0.298)		(0.487)	(0.459)	(0.453)
Share maternal college*	0.076	0.101	0.007		-0.933*	-1.029**	-1.085**
Black	(0.488)	(0.485)	(0.464)		(0.391)	(0.385)	(0.379)
Share maternal college*	0.860*	0.921*	0.739*		0.217	0.133	0.112
Hispanic	(0.368)	(0.359)	(0.358)		(0.552)	(0.516)	(0.530)
Share maternal college*	0.007	0.031	-0.037		-0.348	-0.383	-0.392
Asian	(0.396)	(0.385)	(0.394)		(0.348)	(0.315)	(0.309)
Sample Size	37729	37621	37621		36334	36219	36219
F-Test P-values	0.154	0.084	0.207		0.001	0.000	0.000
R-squared	0.229	0.059	0.045	0.216	0.043	0.032	0.229
Weak IV F-stat		94.582	41.013			80.708	32.064

Notes: See notes for Table 4. The "Share maternal college" is the fraction of students in the grade whose mothers completed a college degree, and in each row this variable is interacted with a dummy for a specific student demographic attribute. All regressions control for school-student type and school-cohort fixed effects, and the share maternal college variable itself is subsumed by the school-cohort fixed effects. The instrumental variable regressions include "omit own cohort controls." All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Table 7. Mechanism Analysis

	GPA (1)	Self-Evaluate (2)	Environment (3)	Mental (4)	Functioning (5)	Misbehave (6)	Addict (7)	Health (8)
				Female Students				
No. of Friends with	0.204**	0.129	0.265**	0.132	0.239**	-0.111	-0.032	0.077
Mom College Graduate	(0.057)	(0.089)	(0.088)	(0.097)	(0.072)	(0.088)	(0.060)	(0.120)
Sample Size	37621	37781	37393	36784	41027	38524	40080	38347
				Male Students				
No. of Friends with	0.032	0.122	-0.003	0.071	0.264	0.029	-0.055	0.160
Mom College Graduate	(0.151)	(0.128)	(0.180)	(0.172)	(0.143)	(0.142)	(0.139)	(0.146)
Sample Size	36219	35962	35561	34589	39552	36951	38658	36564

Notes: Panel 1 presents estimates for the female sample, and Panel 2 presents estimates for the male sample. Each cell displays the coefficient on number of students whose mother have a four year college degree from a separate IV regression; therefore each row contains coefficients from eight IV regressions. The regressions are the same as described in the note for Table 4, except for the dependent variables. Dependent variables, except grade point average, are constructed by factor analysis of students' report on own mental status, behavior, school and family environment (see Appendix Table AX). All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Table 8. Friendship Effects on GPA by Subject Matter

	Subject GPA			
	Math	English	Science	History
	(1)	(2)	(3)	(4)
	Female Students			
No. of Friends with	0.088	0.291**	0.165*	0.371**
Mom College Graduate	(0.099)	(0.085)	(0.076)	(0.090)
Sample Size	35431	36431	33225	32910
	Male Students			
No. of Friends with	-0.118	-0.044	0.104	0.178
Mom College Graduate	(0.185)	(0.192)	(0.192)	(0.165)
Sample Size	34537	35152	32242	31952

Notes: Panel 1 presents estimates for the female sample, and Panel 2 presents estimates for the male sample. Each cell displays the coefficient on number of students whose mother have a four year college degree from a separate IV regression. Column 1 presents estimates for student grade point average in mathematics classes, and Columns 2 through 4 present estimates for English, Science and History classes, respectively. All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Table 9. Heterogeneous Effect of Friendships among Female Students by School Characteristics

Dependent Var: GPA	Low White	High White	Low College	High College	Large School	Small School
	(1)	(2)	(3)	(4)	(5)	(6)
No. of Friends with	0.150**	0.318*	0.212**	0.195	0.214*	0.191**
Mom College Graduate	(0.057)	(0.128)	(0.051)	(0.108)	(0.086)	(0.062)
Sample Size	17675	19946	18537	19084	18035	19586
Weak IV F-stat	128.215	17.692	70.860	71.595	50.988	105.454
Split Location	63.9		23.8		231	

Notes: Each column displays the coefficient estimate on number of students whose mother have a four year college degree from a separate IV regression. Columns 1 and 2 presents estimates for subsamples of school districts that have below or above the median share of white students. Columns 2 and 3 present estimates for subsamples based on school district share maternal college, and student grade point average in mathematics classes, and Columns 5 and 6 present estimates for subsamples based on school size. All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Table 10. Heterogeneous Effect of Friendships among Female Students by Student Characteristics

Dependent Var: GPA	Maternal College (1)	Maternal High School (2)	White (3)	Black (4)	Hispanic (5)
No. of Friends with	0.165	0.337**	0.465*	0.231	0.493
Mom College Graduate	(0.122)	(0.102)	(0.184)	(0.192)	(0.336)
Sample Size	9615	17884	21625	6598	5858
Weak IV F-stat	43.859	124.599	30.746	26.464	14.103

Notes: Each column displays the coefficient estimate on number of students whose mother have a four year college degree from a separate IV regression. Columns 1 and 2 presents estimates for subsamples of students based on having a maternal education of four year college degree or high school graduate, respectively. Columns 3, 4 and 5 present estimates for subsamples based on whether the student is white, black or Hispanic, respectively. All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Appendix

Table A1. Summary Statistics by Gender

Gender	Female		Male	
	Mean (1)	Std Dev (2)	Mean (3)	Std Dev (4)
Panel 1. Student Outcomes				
GPA	2.88	0.78	2.72	0.83
Number Maternal College Friends	0.318	0.654	0.226	0.564
Number Maternal No HS Friends	0.110	0.356	0.047	0.229
Panel 2. Demographics used for Predicting Friendships				
White	0.547	0.498	0.550	0.498
Black	0.185	0.388	0.159	0.366
Hispanic	0.187	0.390	0.197	0.397
Other	0.098	0.298	0.115	0.319
Mom No High School Degree	0.124	0.329	0.091	0.288
Mom High School Graduate	0.461	0.498	0.426	0.494
Mom College Graduate	0.245	0.430	0.262	0.440
Mom Education Missing	0.170	0.375	0.220	0.414
Panel 3. Demographics used for Testing Balance				
Student Age	14.9	1.7	15.1	1.7
No. of People in Household	4.33	1.15	4.27	1.15
No. of School Kids in Household	0.72	0.45	0.74	0.97
Live with Both Parents	0.728	0.445	0.725	0.447
Live with Biological Parents	0.946	0.226	0.936	0.246
Mother's Education in Years	13.3	2.4	13.4	2.4
Mother Born in US	0.825	0.380	0.823	0.382
Student Born in US	0.905	0.293	0.902	0.297
Student Adopted	0.031	0.173	0.031	0.172
Health Condition at Birth	0.022	0.147	0.018	0.134
Panel 4. School District Attributes				
School Percent White Students	0.542	0.301	0.556	0.301
School Percent Maternal College	0.251	0.126	0.257	0.130
School Size (1000's)	1.439	0.647	1.430	0.641
Sample Size	43,306		17,506	

Notes. The table presents means and standard deviations of the variable listed for the entire sample. Columns 1 and 2 present these statistics for the subsample of female students. Columns 3 and 4 present results for the subsample of male students. The sample size row shows the regression sample for which GPA is observed.

Table A2. Balancing Test for Cohort Composition Sorting with Student Characteristics

Independent Variables	%Black (1)	%Hispanic (2)	%Asian (3)	%Mom College Graduate (4)	%Mom HS Dropout (5)
Age	-0.00019	-0.00024	0.00000	-0.00009	0.00024
	(0.00041)	(0.00031)	(0.00022)	(0.00032)	(0.00026)
No. of People in	0.00021	0.00003	0.00013	-0.00001	0.00010
Household	(0.00015)	(0.00016)	(0.00010)	(0.00020)	(0.00014)
No. of School Kids in	0.00003	0.00011	-0.00023	0.00020	0.00020
Household	(0.00018)	(0.00018)	(0.00014)	(0.00020)	(0.00016)
Live with Both	-0.00011	-0.00029	-0.00011	0.00049	-0.00058
Parents	(0.00044)	(0.00035)	(0.00021)	(0.00049)	(0.00035)
Live with Biological	-0.00067	-0.00013	0.00013	0.00078	-0.00002
Parents	(0.00075)	(0.00063)	(0.00036)	(0.00095)	(0.00066)
Mother's Edu in	-0.00003	-0.00005	0.00009	0.00018	-0.00003
Single Year	(0.00012)	(0.00006)	(0.00005)	(0.00017)	(0.00010)
Mother Born in US	0.00181	-0.00049	-0.00082	-0.00003	-0.00015
	(0.00111)	(0.00047)	(0.00066)	(0.00066)	(0.00053)
Born in US	-0.00061	-0.00045	-0.00031	-0.00130	-0.00011
	(0.00065)	(0.00068)	(0.00054)	(0.00067)	(0.00069)
Adopted	-0.00125	0.00037	0.00012	0.00003	-0.00058
	(0.00108)	(0.00090)	(0.00078)	(0.00102)	(0.00088)
Health Condition at	0.00016	0.00010	0.00118	0.00110	-0.00022
Birth	(0.00099)	(0.00105)	(0.00078)	(0.00128)	(0.00097)
Sample Size	84,689	84,687	84,689	84,680	84,680
R-squared	0.976	0.976	0.93897	0.904	0.890
F-test	0.852	0.639	1.523	1.077	0.797
F-pvalue	0.580	0.778	0.137	0.384	0.632

Notes: Each column displays a separate regression of a cohort composition variable on ten predetermined demographics variables. To maintain the sample size, we also include interaction terms of each predetermined demographic variable and the indicator for non-missing value of that variable. The cohort composition variables for a student includes the percentage of black (not Hispanic), Hispanic, other/Asian, mother graduated from four year college and mother dropout from high school, omitting the student's own contribution. All regressions control for school-gender fixed effect, grade dummies, and a Guryan type control for school level composition omitting the student him/herself. Standard errors are clustered at the school level. Observations with missing maternal education data are assigned the median value of the cohort variable of all other students in the school-grade-gender group. **p<0.01 and *p<0.05.

Table A3. Balancing Test for Friend Choice Sorting with Student Demographic Characteristics

	Predicted No. of Friends			
	Female		Male	
Independent Variables	Mom College Graduate	Mom HS Dropout	Mom College Graduate	Mom HS Dropout
Age	-0.00086	-0.00011	-0.00034	-0.00005
	(0.00067)	(0.00034)	(0.00037)	(0.00024)
No. of People in Household	-0.00030	0.00011	0.00030	0.00024
	(0.00035)	(0.00023)	(0.00025)	(0.00017)
No. of School Kids in Household	-0.00036	-0.00015	-0.00048	0.00004
	(0.00038)	(0.00020)	(0.00029)	(0.00015)
Live with Both Parents	0.00166	0.00030	-0.00015	-0.00055
	(0.00132)	(0.00059)	(0.00065)	(0.00042)
Live with Biological Parents	0.00126	0.00030	0.00051	-0.00037
	(0.00221)	(0.00136)	(0.00145)	(0.00087)
Mother's Years of Education	0.00027	-0.00055*	-0.00028	0.00011
	(0.00037)	(0.00023)	(0.00035)	(0.00020)
Mother Born in US	-0.00157	-0.00001	-0.00042	0.00077
	(0.00204)	(0.00080)	(0.00087)	(0.00070)
Born in US	0.00097	-0.00001	0.00058	0.00015
	(0.00216)	(0.00100)	(0.00126)	(0.00079)
Adopted	0.00232	-0.00117	0.00104	0.00030
	(0.00206)	(0.00123)	(0.00182)	(0.00118)
Health Condition at Birth	-0.00018	-0.00030	-0.00006	-0.00096
	(0.00249)	(0.00138)	(0.00160)	(0.00070)
Sample Size	37,621	37,621	36,219	36,219
R-squared	0.96171	0.94284	0.97691	0.89273
F-Statistic	0.977	0.875	0.548	1.010
F-pvalue	0.469	0.560	0.851	0.442

Notes: Each column displays a separate regression of the instrument variable--predicted number of mutual friends with college graduate mothers or with high school dropout mothers, on ten predetermined demographics variables and the interaction terms of the predetermined demographic variables and their indicators for non-missing values. All regressions control for school-gender-student type fixed effect and school-grade fixed effect. A control for omitting self from cohort composition is included in all regressions, but results are very similar with or without this control. Standard errors are clustered at the school level. **p<0.01 and *p<0.05.

Table A4. Balancing Test for Actual Friends with Student Demographic Characteristics

	Actual No. of Friends			
	Female		Male	
	Mom College Graduate	Mom HS Dropout	Mom College Graduate	Mom HS Dropout
Independent Variables	(1)	(2)	(3)	(4)
Age	-0.05089**	-0.01272**	-0.03467**	-0.00557*
	(0.00566)	(0.00320)	(0.00490)	(0.00221)
No. of People in Household	-0.01299**	0.00303	0.00070	0.00044
	(0.00307)	(0.00164)	(0.00266)	(0.00134)
No. of School Kids in Household	-0.00178	-0.00391	-0.00713*	-0.00158
	(0.00368)	(0.00223)	(0.00297)	(0.00139)
Live with Both Parents	0.06408**	-0.00399	0.04073**	-0.00198
	(0.00962)	(0.00396)	(0.00769)	(0.00331)
Live with Biological Parents	-0.00219	0.00594	-0.01003	-0.00410
	(0.01536)	(0.01277)	(0.01113)	(0.00510)
Mother's Years of Education	0.02371**	-0.00531*	0.01439**	-0.00254
	(0.00472)	(0.00228)	(0.00277)	(0.00171)
Mother Born in US	0.01081	-0.02695*	0.00022	-0.00986
	(0.01051)	(0.01259)	(0.00951)	(0.00586)
Born in US	0.02767	0.00471	0.02855*	-0.00423
	(0.02252)	(0.00670)	(0.01373)	(0.00498)
Adopted	-0.05720**	0.00703	-0.03377*	-0.00662
	(0.01834)	(0.01246)	(0.01338)	(0.00598)
Health Condition at Birth	-0.02685	-0.01913	-0.02608	-0.01415
	(0.01723)	(0.00969)	(0.02052)	(0.00948)
Sample Size	43,306	43,306	43,700	43,700
R-squared	0.19510	0.11159	0.17616	0.09350
F-Statistic	11.78	3.741	9.094	3.060
F-pvalue	0.0000	0.0003	0.0000	0.0023

Notes: Each column displays a separate regression of the instrument variable--predicted number of mutual friends with college graduate mothers or with high school dropout mothers, on ten predetermined demographics variables and the interaction terms of the predetermined demographic variables and their indicators for non-missing values. All regressions control for school-gender-student type fixed effect and school-grade fixed effect. A control for omitting self from cohort composition is included in all regressions, but results are very similar with or without this control. Standard errors are clustered at the school level. **p<0.01 and *p<0.05.

Table A5. Standard Deviation of Instruments

Predicted Number of Friends	Maternal College		Maternal No High School	
	Female	Male	Female	Male
	(1)	(2)	(3)	(4)
Standard Deviation	0.309	0.265	0.140	0.086
Standard Deviation within FE	0.147	0.128	0.082	0.054

Notes: The first row presents the standard deviation of the predicted number of friends whose mothers have a four year degree for the female and male subsamples (columns 1 and 2) and the predicted number of friends whose mothers do not have a high school degree (columns 3 and 4). The second row predicts the residual standard deviation after removing school district by student type fixed effects.

Table A6. Cohort Level Analysis of Peer Effects on GPA

Independent Variables	Female (1)	Male (2)
Share Maternal College	0.585**	0.499*
	(0.210)	(0.242)
Mom No High School Degree	-0.213**	-0.191**
	(0.020)	(0.023)
Mom College Graduate	0.251**	0.251**
	(0.013)	(0.016)
Mom Education Missing	-0.154**	-0.132**
	(0.014)	(0.014)
Sample Size	37729	36334
R-squared	0.145	0.139
F-Statistic	78.383	60.214

Notes: The table presents estimates for a regression of student grade point average on the fraction of students in a cohort whose mother completed a four-year college degree or more. The model includes dummies for maternal educational attainment plus cohort and school fixed effects. Standard errors are clustered at the school level.

Table A7. First Stage for Total Number of Friends and Number of Friends by Race

	Female			Male		
Predicted No. of Friends	Total	Black	Hispanic	Total	Black	Hispanic
Total	0.726**			0.731**		
	(0.047)			(0.066)		
Black		0.809**			0.649**	
		(0.091)			(0.095)	
Hispanic			0.677**			0.586**
			(0.121)			(0.104)
N	43306	43306	43306	43700	43700	43700
R-squared	0.223	0.382	0.249	0.193	0.283	0.178
F_iv	235.131	79.384	31.455	121.205	46.680	31.824

Notes: Predicted number of friends is generated by summing up the predicted probability of being friends from estimation using the pair level match sample for each student over all potential friends of a certain type (e.g. black). All regressions control for school-gender-student type fixed effect, school-grade fixed effect, and Guryan type controls for school level friendship pattern omitting the student's contribution. Standard errors are clustered at the school level. **p<0.01 and *p<0.05.

Table A8. Multivariate Instrumental Variables Analyses

	Female GPA			Male GPA		
	2IV	3IV	5IV	2IV	3IV	5IV
	(1)	(2)	(3)	(4)	(5)	(6)
No. of Friends with Mom College Graduate	0.204**	0.290**	0.268**	0.047	-0.098	-0.202
	(0.056)	(0.086)	(0.091)	(0.153)	(0.191)	(0.206)
No. of Friends with Mom HS Dropout	0.038	0.152	0.237	0.166	-0.019	-0.018
	(0.183)	(0.182)	(0.195)	(0.199)	(0.240)	(0.231)
Total No. of Friends		-0.084	-0.040		0.129	0.268*
		(0.070)	(0.083)		(0.107)	(0.120)
No. of Black Friends			-0.063			-0.317
			(0.108)			(0.192)
No. of Hispanic Friends			-0.212			-0.363*
			(0.174)			(0.182)
Obs.	37621	37621	37621	36219	36219	36219
Weak IV F-stat	21.794	31.462	14.921	59.373	32.334	15.858

Notes: Each column displays a separate regression of GPA on number of mutual friends in different categories. Numbers of mutual friends are instrumented with the corresponding predicted number of friends. All regressions control for school-gender-cross pair type fixed effect and school-grade fixed effect. Guryan type controls for school level friendship pattern are included for each instrumented variable in both first and second stage. Standard errors are clustered at the school level. **p<0.01 and *p<0.05.

Table A9. Friendship Effects using Opposite Gender Model or Cohort Composition

Reverse	Model Only		Model and Composition	
	Female	Male	Female	Male
Student type	(1)	(2)	(3)	(4)
No. of Friends with	0.140	0.093	0.162	0.090
Mom College Graduate	(0.144)	(0.290)	(0.319)	(0.375)
Sample Size	37621	36219	37621	36219

Notes: Columns 1 and 2 present estimates where the predicted number of friends whose mothers have a four year college degree is based on the fixed effect estimates for the opposite gender. Columns 3 and 4 present the same estimates also using the cohort composition for opposite gender students. All standard errors are clustered at the school district level. **p<0.01 and *p<0.05.

Table A10. Factor Analysis Elements

	Survey Questions
Self Evaluation	How strong do you agree or disagree with each of the following statements? --I am physically fit. --I have a lot to be proud of. --I like myself just the way I am. --I feel like I am doing everything just right. --I have a lot of good qualities. In general, how hard do you try to do your school work well?
Environmental Evaluation	How strong do you agree or disagree with each of the following statements? --I feel close to people at this school. --I feel like I am part of this school. --The students at this school are prejudiced. --The teachers at this school treat students fairly. --I feel safe in my school. --I am happy to be at this school.
Mental Health	How often did you feel depressed or blue in the last month? How often did you afraid of things in the last month? How strong do you agree or disagree with each of the following statements? --I feel loved and wanted. --I feel socially accepted. What do you think are the chances you will be killed by age 21.
Functioning well in School	Since school started this year, how often have you had trouble: --getting along with your teachers? --paying attention in school? --getting your homework done? --getting along with other students?
Problematic Behavior	During the past twelve months, how often did you: --lie to your parents or guardians? --skip school without an excuse? In the past year, how often have you gotten into a physical fight?
Smoking and Drinking	During the past twelve months, --did you smoke cigarettes every week? --did you drink beer, wine, or liquor every week? --did you get drunk every week? Have you had a drink of beer, wine, or liquor—not just a sip or a taste of someone else's drink—more than two or three times in your life?
Health Status	In general, how is your health? How strongly do you agree or disagree with each of the following statements? --I seldom get sick. --When I do get sick, I get better quickly. In the last month, how often did a health or emotional problem cause you to: --miss a day of school? --miss a social or recreational activity?
Notes: all variables from original dataset are converted to binary indicators to simplify the factor analysis.	