

Intergenerational Closure and Academic Achievement in High School: A New Evaluation of Coleman's Conjecture

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Supplementary Appendix

Data were drawn from the 2002 base-year and 2004 follow-up waves of the Education Longitudinal Study of 2002 (ELS), which was collected by the National Center for Education Statistics (NCES) of the U.S. Department of Education.¹ The ELS is a nationally representative sample of students in public and private high schools, based on a two-stage sampling design that first draws a random sample of public and private high schools and then draws a random within-school sample of sophomores. For the first follow-up in 2004, respondents were followed to alternative destinations, but the vast majority of respondents were high school seniors in 2004.

The base-year 2002 wave includes a nationally representative sample of 15,360 respondents who were high school sophomores during the 2001-02 academic school year.² The base-year study included seven questionnaire components: student, parent, math teacher, English teacher, school administrator, librarian, and a facilities checklist.

The 2004 wave (hereafter, the first follow-up) was conducted during the 2003-04 school year, and it includes a supplemental sample of 1,013 respondents who were not participants at the time of the base-year wave but were selected and were eligible at the time of the first follow-up wave. Participants who entered the survey during the first follow-up wave are: (1) base-year non-respondents who were eligible but did not participate in the base-year wave and participated in the follow-up wave ($N = 653$), (2) base-year ineligible students who became eligible at the time of the first follow-up wave ($N = 158$), or (3) freshened students who were enrolled in the 12th grade during the spring of 2004 ($N = 202$).³ The freshened sample of seniors was drawn from the participating base-year schools. The addition of these three groups makes the sample nationally representative of high school seniors in 2004, which allows the data to be used for cross-sectional analysis or longitudinal analysis. We do not include any of these 1,013

¹ The design of the ELS allows it to be used on its own as a longitudinal survey or as a cross-sectional survey that is compatible with two prior studies: the High School and Beyond (HS&B) and National Education Longitudinal Survey of 1988 (NELS:88).

² There are 15,362 respondents in the base-year wave data, 2 of which have been removed from the base-year to first follow-up data.

³ An example of a respondent who gained eligibility is someone who was not proficient in the English language to complete the base-year survey but gained proficiency by the time of the first follow-up.

respondents in our analysis of 2004 test scores. Our focal analysis group remains the 15,360 respondents who were high school sophomores when interviewed in 2001-02.

Unlike the base-year wave, which includes seven different questionnaires, the first follow-up wave only administers questionnaires to students and administrators. Students who were enrolled in the same school for the first-year wave as for the base-year wave completed the student questionnaire (as did freshened students). Students whose enrollment status changed between the base-year and first follow-up waves – e.g., they dropped out, graduated early, were homeschooled, or transferred schools – were administered a specialized questionnaire that corresponded to their enrollment status.⁴

Achievement Tests

Respondents were administered achievement tests for the base-year and first follow-up waves. Base-year respondents were administered math and reading achievement tests, but only math tests were administered for the follow-up wave. However, not all follow-up respondents who were in the base-year wave completed the math test in 2004. Achievement tests were administered to students who were enrolled in the participating base-year schools. Accordingly, test scores were imputed by NCES for transfer students and homeschooled students, and dropouts and early graduates do not have test scores for the follow-up wave.

Selection of the Sample and Construction of the Direct-Adjustment Weight for the Math Gains Models

For this article, our goal is to model the relationships between family background, social networks, and student achievement. Family background and social network information is gathered from the base-year student and parent questionnaires, while school-level information is gathered from the administrator and teacher questionnaires. Since social network data are only available for the base-year survey, we restricted the sample to respondents who were sampled for both the base-year and first follow-up waves ($N = 15,325$).⁵

Table S1 presents the first follow-up enrollment status of the sample using the status variable F1UNIV2B cross-tabulated by base-year school type and transfer status between 2002 and 2004. Because transfer students are different from their peers who remain in the same school, we constructed a first follow-up school status variable using F1UNIV2B and transfer status patterns from Table S1. This variable is represented by the rows of Table S2, which is simply then a collapsed version of Table S1. We are most interested in students who remain in school, and so transfer students are further divided by sector type. We also combine “out of scope” respondents with students who were homeschooled because of small cell sizes.

⁴ Dropouts are defined as individuals who were (1) not enrolled in school during the spring term 2004, (2) had not completed a high school diploma or General Educational Development (GED), and (3) missed at least 4 consecutive weeks of school. Respondents who dropped out for a short while but returned to school at least 2 weeks prior to the first follow-up are treated as students rather than dropouts.

⁵ As a result, 35 base-year respondents were dropped from our analysis: 21 respondents who were deceased at the time of the follow-up wave and 14 who were institutionalized.

The variable defined by the rows of Table S2 is then specified as a dependent variable for the multinomial logit reported in Table S3. Accordingly, the 9 first follow-up destinations are: (1) In school, in grade, non-transfer; (2) In school, in grade, transfer, same sector; (3) In school, in grade, transfer, different sector; (4) In school, out of grade, non-transfer; (5) In school, out of grade, transfer; (6) Homeschooled, out of scope; (7) Early graduate, (8) Dropout; (9) Nonrespondent/status unknown. The predictor variables include dummies for gender, race, urbanicity, region, and family structure as well as variables for parents' education, occupational prestige, and family income. The model yielded a chi-squared test statistic of 1388.5 with 152 degrees of freedom, which indicates that these predictor variables account for a substantial portion of the variation in trajectories.

To construct the direct adjustment weight, we then used only the odds of being in category (1). Thus, patterns of movement between the other categories were examined only to make sure that the predictor variables were sufficiently carefully sorting the sample in expected ways (i.e., to verify that parental education is more strongly predictive of retention and dropout than of homeschooling, and so on). Descriptive statistics of the direct-adjustment weight are presented in Table S4. The base-year student weight constructed by contractors to the Department of Education has a standard deviation of .63, when normalized to have a mean of 1 across the 13,943 respondents in our base-year analysis sample (with minimum and maximum values of .02 and 4.12). Our direct-adjustment weight, when normalized to have a mean of 1 across the 10,502 respondents in our first follow-up analysis sample, has a standard deviation of .67 (with minimum and maximum values of .02 and 5.31). The greater relative dispersion of the direct-adjustment weight reflects its incorporation of the estimated odds of non-attrition.

[TABLES S1 THROUGH S4 HERE]

Imputation of Item-Specific Missing Data

Item-specific missing data were best-subset regression imputed for the sample of respondents who participated in both the base-year and first follow-up waves ($N = 15,325$). The Stata command “impute” was used for categorical or continuous variables, and a user-augmented logit-based command, “implog,” was used for dummy variables.

The imputation process was completed in five steps: (1) create a core set of variables used for all subsequent imputation; (2) impute student and parent variables using the core variables from Step 1 as well as specific additional variables for each target variable; (3) collapse student network data at the school-level, creating school means for each network variable; (4) merge the school-level means back into the student-level data; and (5) impute student network variables using the core set of variables, additional student-level network variables, and the school-level means.

Step 1. We selected a set of NCES composite variables (for a description of how composite variables were constructed, see subsection 3.3 and Appendix F of the Base-Year User's Manual). In most cases, NCES imputed missing data for all cases on these variables, and we accepted their imputations. These variables include: student's sex, student's race, region, urbanicity, school type, mother's education (in years),

father's education (in years), mother's occupational prestige (1989 GSS coding), father's occupational prestige (1989 GSS coding), family income (natural log), and family structure (i.e., mother only, father only, and other family structure).⁶

Step 2. Student and parent characteristics were then best-subset regression imputed. These variables include *learning disability, behavior* (i.e., number of times suspended this year, number of times on probation this year, ever held back prior to this year, and repeat the 4th grade), *educational expectations* (i.e., mother's expectations, father's expectations, and student's expectations), *factors important in choosing future college* (i.e., curriculum, athletics, low crime rates, and academics), *tracking characteristics of school* (i.e., percent college prep, percent remedial reading, and percent remedial math), *parental involvement in school organizations* (i.e., belong to parent-teacher organization, attend parent-teacher organization meetings, take part in parent-teacher organization activities, volunteer at school, and attend other organization), *parental involvement and attitudes about school* (i.e., parents invest in community; school assigns too little homework, children challenged at school, child works hard, and school prepares students for college), and the *number of years parents lived in community*.

All variables were imputed using the core set of variables based on NCES composite variables noted in Step 1. Except for *learning disability* and the four *behavior* variables, which were imputed using only the core set of variables, all other student and parent variables were imputed using additional variables. Within each group of variables (e.g., *factors important in choosing future college*), variables were imputed using the other variables within the group. Moreover, *educational expectations* was also imputed from significant others' influence (i.e., the mean of BY566A-BY566G), academic track, and the numbers of hours per week the respondent spent on homework out of school. *Factors important in choosing future college* were imputed using the core variables and variables for the importance of an active social life, and the importance of a religious environment, as well as the percent of students in college prep, general, and other tracks. *Tracking characteristics of school* were imputed using the core variables and variables for the percent of students in general, other, vocational, IEP, and alternative tracks. *Parent involvement in school organizations* was imputed using the core variables and variables indicating whether or not parents attended religious services with their child. *Parental involvement and attitudes about school* were imputed using the core variables and variables for parental investment in the community (including the variable *number of years parents lived in community*).

The final three steps pertain only to the student network data, which include the primary explanatory variable *parents know parents* (as indicated by both respondents and

⁶ Recoding mother's occupation and father's occupation into 1989 GSS occupational prestige scores resulted in missing information for mothers or fathers who "never held a job for pay," or were identified as a "homemaker" or in "military" (1,389 mothers and 769 fathers). Prestige scores were imputed using the common set of variables minus mother's occupational prestige and father's occupational prestige. These imputed values can be thought of as "what if" prestige scores.

their parents) and *student network structure* (e.g., number of friends nominated, same sex, grade below, and grade above):

Step 3. The student network data were collapsed at the school level, and school means of each network variable were created.

Step 4. The school-level means were merged with the student-level data.

Step 5. The student network variables were then imputed using (1) the core set of variables, (2) the school-level mean of the variable being imputed, (3) additional student-reported network variables (including the number of friends nominated, know friends' parents, parents know friends' parents, and same-sex friendship), (4) additional parent-reported network data (including parent knows friend, parents knows friend's parents, and friend attends the same school as the student).

ADDITIONAL RESULTS

Descriptive Statistics

Tables S5 and S6 present the standard deviations of the primary variables used to transform the coefficients into comparable standardized metrics for the main text of the article.

[TABLES S5 THROUGH S6 HERE]

Additional Figures

Because of space constraints, we present a graphical representation of the closure associations only for Model 3 from Table 2 in the main text. Figures S1 through S5 present models for all five models, separately by school sector, from Table 2.

[FIGURES S1 THROUGH S5 HERE]

Complementary Regression Models with Slightly Different Specifications

Table S7 presents the pooled regression models corresponding to Table 2, as discussed in footnote 7 in the results section. Table S8 presents models of 12th grade test scores, from which the coefficients in Table 3 are drawn. Table S8 also includes a Model 5, which is analogous to the same Model in Table 2 that includes the additional variables that can be interpreted as either confounders or mediators. Table S9 is equivalent to Table S8, but math gains are used as the dependent variable instead of 12th grade test scores alone. Table S10 then takes the models in Table S9 and adds a lagged 10th grade test score as an independent variable. Nothing in these models contradicts the interpretations and conclusions offered in the main text.

[TABLES S7 THROUGH S10 HERE]

Regression Models that Utilize Parent-Reported Measures of Social Closure

For the models in the main text, we use student-reported measures of social closure. There are parent-reported measures available as well, and these are used for the alternative models in Tables S11 through S13. As we will explain later, the results are similar. We use the student reported measures in the main paper for the following three reasons:

1. There is much more missing data on the parent-reported network data, both as survey non-response and item-specific non-response. In combination, over the whole sample, there were about 2,500 students who had valid student-reported *parents know parents* data but not valid parent-reported *parents know parents*. It would be naive to simply impute this data, as clearly missingness is an inverse function of true closure itself, especially in view of the next point.
2. The parent questionnaire is completed by a guardian or parent, and the equivalent *parents know parents* questions refer to “you” rather than to the students’ parents. This creates complications, given that the reference of the question is a function of who answers the question. 74.5% of parental respondents are mothers; 16.9% are fathers; the remaining 8.4% are spread across 14 separate categories. Taking account of this heterogeneity would necessitate another level of modeling, with the goal of eliminating noise in the closure measure that is a function of who responds to the parent questionnaire. In contrast, the student-based network data are completely straightforward and align well with Coleman’s hypothesis and proposed measure of closure. They are closer to what Hallinan and Kubitschek (1999) argued should be analyzed in an evaluation of Coleman’s conjecture.
3. The parent network data would have been very useful supplementary information if parents had been asked to provide an indication of whether they knew the parents of the friends whom their 10th grader had nominated. Unfortunately, this was too costly for NCES to implement (even though that is what we suggested to them). Instead, NCES put a new name generator on the parent questionnaire, asking parents themselves to nominate their students’ friends. There are three problems with the name generator on the parents’ questionnaire. Similar to the NELS, it did not ask the parents to restrict the student’s friends to those in their school. This creates a mismatch with the student name generator, which asked only for best friends in the present school. Second, in the parent name generator there is a built-in bias toward generating names of friends whose parents the parent or guardian knows. For quite obvious reasons, some students hide their best friends from their parents, and this is more likely to be the case for friends whose parents are not known by their own parents! This was a major flaw with the NELS design, and we did not want to repeat it in our ELS-based analysis. Third, because there is no way to link the parent responses to the student responses, there is no way to model student network structure while using a parent-reported measure of social closure. We show in our main results that this is consequential, since out-of-grade friendships are related to both lower achievement and lower levels of closure.

Because of this reasoning, we do not analyze the parent-based network data in the main text of the paper.

Nonetheless, we expect readers will be curious about how the results differ when parent-reported measures are used. These results are presented in Tables S11 through S13, and they are similar in the sense that the closure association with achievement remains substantially larger in Catholic schools than in public schools. Yet the results are different as well, in that the estimated coefficients are larger in all cases, so that even the public sector results suggest that there is a substantial closure effect when measured in this way. Our view is that all of the coefficients for *parents know parents* in Tables S11 through S13 are biased upward because of the reasons just stated. The estimated effect is confounded by the characteristics of who answered the parent questionnaire (i.e., those students whose mothers were more likely to answer the parent questionnaire were more likely to have higher levels of achievement and higher levels of reported social closure). This would also explain why there now appears to be a more substantial individual-level effect of parental closure.

[TABLES S11 THROUGH S13 HERE]

Thus, for the main text, we utilize only student-reported data. The direct student-reported measure of closure is more straightforward, more reliable, and closer to the concept that Coleman used to develop his own conjecture.

Results for Non-Catholic Private Schools

Tables S14 through S18 repeat all steps of the analysis reported in the main text, but here they are estimated for non-Catholic private schools. As noted in the main text, there is a positive and substantial association between social closure and achievement in Models 1 and 2, even though it is smaller than for Catholic and public schools and more imprecisely estimated. When further adjustment variables are added in Models 3 through 5, these coefficients drop precipitously. Because this category of schools is relatively small and quite heterogeneous, we do not emphasize these results in the main text.

[TABLES S14 THROUGH S18 HERE]

Table S1. First Follow-up Status by Base-Year School Control and Transfer Status

Follow-up status	Public in base-year			Catholic in base-year			Other Private in base-year			Total
	Non-Transfer	Transfer, Same Sector	Transfer, Different Sector	Non-Transfer	Transfer, Same Sector	Transfer, Different Sector	Non-Transfer	Transfer, Same Sector	Transfer, Different Sector	
In school, in grade	8,842	772	33	1,660	25	115	1,069	56	80	12,652
In school, out of grade	126	89	1	3	1	8	6	1	6	241
Homeschooled	26			2			11			39
Early graduate	480			8			29			517
Dropout	585			8			20			613
Out of scope/country	72			7			20			99
Nonrespondent/F1 status unknown	999			81			84			1,164
Total	11,130	861	34	1,769	26	123	1,239	57	86	15,325

Table S2. Collapsed Version of First Follow-up Status by Base-Year School Control and Transfer Status (Table S1), Used to Define Categories for Multinomial Logit in Table S3

Follow-up status (collapsed from Table S1)	Public	Catholic	Other Private	Total
In school, in grade, non-transfer	8,842	1,660	1,069	11,571
In school, in grade, transfer, same sector	772	25	56	853
In school, in grade, transfer, different sector	33	115	80	228
In school, out of grade, non-transfer	126	3	6	135
In school, out of grade, transfer	90	9	7	106
Homeschooled, out of scope	98	9	31	138
Early graduate	480	8	29	517
Dropout	585	8	20	613
Nonrespondent/F1 status unknown	999	81	84	1,164
Total	12,025	1,918	1,382	15,325

Table S3. Multinomial Logit Coefficients Used to Construct the Direct Adjustment Weight, Outcome Destinations Defined in Tables S1 and S2 (Reference is *In School, in grade, non-transfer*)

Variable	Coefficient	Standard Error	Z	P> Z
<i>In school, in grade, transfer, same sector</i>				
Female	-.090	.083	-1.09	.275
Black	.697	.136	5.13	.000
Hispanic	.298	.126	2.37	.018
Asian	.136	.182	0.75	.456
Native American	.846	.402	2.11	.035
Multiracial	.306	.224	1.36	.173
Father only	.241	.217	1.11	.266
Mother only	.230	.110	2.08	.037
Other family member	.593	.328	1.81	.071
Mother's education	-.043	.022	-1.94	.053
Father's education	-.009	.020	-0.43	.664
Mother's SEI	-.004	.004	-1.16	.247
Father's SEI	-.009	.004	-2.14	.032
Family income (natural log)	-.088	.037	-2.36	.018
Suburban	-.192	.116	-1.66	.097
Rural	-.137	.142	-0.97	.334
Northeast	-.638	.166	-3.84	.000
South	-.074	.120	-0.62	.537
West	.285	.151	1.88	.060
Constant for category	-.351	.428	-0.82	.413
<i>In school, in grade, transfer, different sector</i>				
Female	-.372	.176	-2.12	.034
Black	-.293	.338	-0.87	.387
Hispanic	-.564	.327	-1.73	.084
Asian	.260	.307	0.85	.398
Native American	.258	1.058	0.24	.807
Multiracial	.311	.417	0.75	.456
Father only	-.092	.577	-0.16	.873
Mother only	.591	.256	2.31	.021
Other family member	.316	.801	0.40	.693
Mother's education	.009	.041	0.22	.825
Father's education	.097	.042	2.28	.022
Mother's SEI	-.004	.007	-0.50	.619
Father's SEI	-.015	.009	-1.66	.098
Family income (natural log)	.446	.130	3.44	.001
Suburban	-.617	.229	-2.70	.007
Rural	-1.825	.410	-4.45	.000
Northeast	-.140	.321	-0.44	.663
South	-.155	.265	-0.58	.560
West	-.475	.343	-1.39	.165
Constant for category	-9.363	1.446	-6.48	.000
<i>In school, out of grade, non-transfer</i>				
Female	-.386	.200	-1.93	.054
Black	.834	.319	2.61	.009
Hispanic	1.070	.294	3.63	.000
Asian	.597	.326	1.83	.067
Native American	.913	.769	1.19	.235

Multiracial	.390	.437	0.89	.373
Father only	.831	.421	1.97	.049
Mother only	.083	.235	0.35	.724
Other family member	-1.065	1.022	-1.04	.297
Mother's education	-.188	.065	-2.91	.004
Father's education	-.069	.056	-1.21	.225
Mother's SEI	-.005	.010	-0.50	.620
Father's SEI	-.007	.012	-0.61	.540
Family income (natural log)	-.049	.062	-0.78	.433
Suburban	-.426	.258	-1.65	.099
Rural	-.321	.317	-1.01	.311
Northeast	.317	.307	1.03	.302
South	.165	.268	0.62	.537
West	-.210	.373	-0.56	.574
Constant for category	-.143	.818	-0.17	.861
<i>In school, out of grade, transfer</i>				
Female	-.394	.221	-1.79	.074
Black	.908	.372	2.44	.015
Hispanic	.453	.372	1.22	.223
Asian	-.160	.540	-0.30	.767
Native American	-.316	1.107	-0.29	.776
Multiracial	1.268	.442	2.87	.004
Father only	.072	.613	0.12	.906
Mother only	.283	.270	1.05	.295
Other family member	.991	.771	1.28	.199
Mother's education	-.117	.072	-1.63	.104
Father's education	-.139	.088	-1.58	.115
Mother's SEI	-.030	.010	-2.88	.004
Father's SEI	.007	.015	0.47	.638
Family income (natural log)	.022	.084	0.26	.792
Suburban	-.332	.280	-1.19	.235
Rural	-.407	.399	-1.02	.307
Northeast	.066	.407	0.16	.871
South	.362	.328	1.10	.270
West	.766	.380	2.02	.044
Constant for category	-.917	1.377	-0.67	.506
<i>Homeschooled, out of scope</i>				
Female	-.413	.213	-1.94	.052
Black	.250	.358	0.70	.484
Hispanic	1.039	.260	3.99	.000
Asian	.548	.441	1.24	.214
Native American	-.259	.979	-0.26	.791
Multiracial	.200	.507	0.39	.693
Father only	.003	.546	0.00	.996
Mother only	.205	.253	0.81	.416
Other family member	.853	.739	1.15	.248
Mother's education	-.032	.062	-0.51	.610
Father's education	.017	.048	0.35	.727
Mother's SEI	.005	.010	0.49	.625
Father's SEI	.010	.012	0.79	.432
Family income (natural log)	-.046	.067	-0.68	.496
Suburban	-.075	.263	-0.28	.776

Rural	-.179	.342	-0.52	.601
Northeast	.018	.362	0.05	.961
South	.263	.286	0.92	.357
West	.189	.344	0.55	.582
Constant for category	-4.691	.907	-5.17	.000
<i>Early Graduate</i>				
Female	-.124	.099	-1.25	.212
Black	.031	.161	0.19	.849
Hispanic	.114	.175	0.66	.512
Asian	-.391	.256	-1.53	.126
Native American	.403	.576	0.70	.484
Multiracial	.275	.246	1.12	.263
Father only	.208	.272	0.76	.445
Mother only	.312	.133	2.34	.019
Other family member	.742	.390	1.90	.057
Mother's education	-.050	.033	-1.53	.127
Father's education	-.069	.029	-2.41	.016
Mother's SEI	-.014	.005	-2.76	.006
Father's SEI	.009	.006	1.67	.095
Family income (natural log)	-.068	.046	-1.47	.142
Suburban	-.288	.145	-1.99	.046
Rural	-.669	.177	-3.77	.000
Northeast	-.477	.217	-2.19	.028
South	.302	.159	1.90	.058
West	-.015	.203	-0.08	.940
Constant for category	-.274	.526	-0.52	.602
<i>Dropout</i>				
Female	-.352	.098	-3.61	.000
Black	.491	.156	3.15	.002
Hispanic	.330	.146	2.26	.024
Asian	-1.030	.246	-4.19	.000
Native American	-.064	.438	-0.14	.885
Multiracial	.528	.211	2.50	.012
Father only	.353	.235	1.51	.132
Mother only	.265	.116	2.29	.022
Other family member	.775	.363	2.13	.033
Mother's education	-.142	.032	-4.39	.000
Father's education	-.139	.030	-4.69	.000
Mother's SEI	-.016	.005	-2.95	.003
Father's SEI	-.006	.006	-1.08	.281
Family income (natural log)	-.095	.041	-2.33	.020
Suburban	-.327	.115	-2.84	.005
Rural	-.327	.153	-2.14	.033
Northeast	.045	.168	0.27	.789
South	.120	.129	0.93	.353
West	.008	.165	0.05	.963
Constant for category	2.923	.566	5.17	.000
<i>Non-respondent, follow-up status unknown</i>				
Female	-.068	.075	-0.91	.364
Black	.078	.122	0.64	.525
Hispanic	.010	.140	0.07	.942

Asian	-0.100	.142	-0.71	.481
Native American	.575	.329	1.75	.081
Multiracial	.543	.149	3.65	.000
Father only	.125	.198	0.63	.527
Mother only	.249	.095	2.60	.009
Other family member	.528	.364	1.45	.146
Mother's education	-.081	.025	-3.31	.001
Father's education	-.062	.018	-3.46	.001
Mother's SEI	-.008	.003	-2.19	.028
Father's SEI	.003	.004	0.89	.372
Family income (natural log)	.002	.038	0.05	.957
Suburban	-.249	.097	-2.56	.010
Rural	-.443	.131	-3.39	.001
Northeast	-.143	.145	-0.98	.325
South	.103	.116	0.89	.375
West	.203	.132	1.55	.122
Constant for category	-.021	.460	-0.05	.964

Notes: N = 15,325. Wald chi-squared (152) = 1388.50.

Table S4. Raw and Normalized Base-Year Poststratification Weight (BYSTUWT) and the Direct Adjustment Weight

Variable	Mean	S.D.	Minimum	Maximum	N
BYSTUWT	237.64	149.36	5.09	978.38	13,943
BYSTUWT ⁿ	1.00	.63	.02	4.12	13,943
Direct Adjustment Weight [*]	316.60	212.38	6.16	1680.82	10,502
Direct Adjustment Weight ^{n*}	1.00	.67	.02	5.31	10,502

Note: Sample is restricted to respondents in Catholic School and Public School.

ⁿ Normalized by dividing through by the mean.

^{*} Restricted to respondents who are “In School, in grade, non-transfer” as of the first follow-up.

Table S5. School-Level Means and Standard Deviations of Primary Variables

Variable	Catholic		Public	
	Mean	S.D.	Mean	S.D.
<i>Math Test Scores</i>				
IRT estimated number right (10 th grade)	49.02	5.78	41.72	6.80
IRT estimated number right (12 th grade)	56.31	6.36	48.10	7.55
Gain Score (12 th -10 th grade IRT estimated number right)	6.69	2.03	4.74	2.22
<i>Parents Know Parents (Mean across nominated friends)</i>	.67	.14	.61	.13
<i>Student Network Structure</i>				
Number friends nominated	2.81	.29	2.72	.28
Same Sex (Mean across nominated friends)	.89	.09	.82	.06
Grade Below (Mean across nominated friends)	.04	.04	.08	.05
Grade Above (Mean across nominated friends)	.08	.06	.18	.08

Notes: N = 95 Catholic schools and N = 580 public schools for all variables except 12th grade math test scores and math gain score). For these two variables, N = 95 Catholic schools and N = 579 public schools.

Table S6. Individual-level Minus School-Level Means and Standard Deviations of Primary Variables

Variable	Catholic		Public	
	Mean	S.D.	Mean	S.D.
<i>Math Test Scores</i>				
IRT estimated number right (10 th grade)	.00	10.53	.00	12.27
IRT estimated number right (12 th grade)	.00	11.06	.00	13.15
Gain Score (12 th -10 th grade IRT estimated number right)	.00	5.69	.00	6.13
<i>Parents Know Parents (Mean across nominated friends)</i>	.00	.30	.00	.31
<i>Student Network Structure</i>				
Number friends nominated	.00	.57	.00	.73
Same Sex (Mean across nominated friends)	.00	.18	.00	.23
Grade Below (Mean across nominated friends)	.00	.14	.00	.18
Grade Above (Mean across nominated friends)	.00	.17	.00	.25

Notes: N = 95 Catholic schools and N = 580 public schools for all variables except 12th grade math test scores and math gain score). For these two variables, N = 95 Catholic schools and N = 579 public schools.

Table S7. Coefficients from Pooled Multilevel Regression Models of 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS					
Constant	42.12	42.46	43.10	43.22	43.43
<i>School-Level Variables</i>					
Catholic school	4.94 (3.32)	2.28 (3.33)	-4.27 (2.47)	-4.95* (2.48)	-6.39* (2.59)
Parents know parents	16.28* (2.40)	13.98* (2.22)	.75 (1.80)	1.07 (1.77)	.20 (1.83)
Catholic school*	2.01 (4.77)	1.70 (4.70)	5.09 (3.44)	5.84 (3.46)	5.56 (3.46)
Parents know parents		.03 (.94)	-.45 (.56)	-.37 (.52)	-.51 (.45)
Number of friends nominated		-6.88 (4.91)	2.32 (3.02)	3.09 (2.89)	3.04 (2.80)
Same Sex		-30.70* (5.19)	-2.69 (3.42)	-2.56 (3.35)	1.44 (2.94)
Grade below		-20.90* (3.46)	-6.85* (2.27)	-6.68* (2.17)	-3.68 (2.04)
Grade above					
<i>Student-Level Variables</i>					
Parents know parents	1.56* (.47)	1.51* (.45)	.67 (.41)	.66 (.41)	-.10 (.37)
Catholic school*	.48 (1.43)	.51 (1.41)	.64 (1.28)	.65 (1.27)	1.05 (1.23)
Parents know parents		.68* (.18)	.43* (.16)	.43* (.16)	.15 (.16)
Number of friends nominated		-1.62* (.64)	-1.17* (.57)	-1.18* (.57)	-.54 (.52)
Same Sex		-7.29* (.78)	-5.17* (.66)	-5.16* (.66)	-3.89* (.63)
Grade below		-5.11* (.57)	-3.58* (.52)	-3.58* (.51)	-2.25* (.48)
Grade above					
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓
Region				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓
RANDOM EFFECTS					
School-level variance	34.45	29.26	9.21	8.66	7.21
Student-level variance	157.26	153.85	124.31	124.33	108.72
Number of schools	675	675	675	675	675
Number of students	13,943	13,943	13,943	13,943	13,943

* p < .05 (two-tailed test)

Table S8. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools

Independent Variable	Catholic					Public				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS										
Constant	55.99	56.01	55.52	55.57	55.55	47.44	47.47	47.87	47.88	47.87
<i>School-Level Variables</i>										
Parents know parents	21.04*	20.88*	9.07*	6.67	1.72	14.42*	14.13*	2.71	3.20	2.02
	(4.23)	(4.59)	(3.80)	(4.20)	(6.17)	(2.32)	(2.26)	(1.81)	(1.77)	(1.95)
Number of friends nominated		-3.33	-1.40	-.86	-.51		.10	.09	.17	.42
		(2.02)	(1.55)	(1.53)	(1.75)		(1.21)	(.70)	(.67)	(.66)
Same sex		-.29	7.31	7.92	6.68		.04	3.52	4.66	4.75
		(6.58)	(5.19)	(5.09)	(6.55)		(5.19)	(3.55)	(3.43)	(3.44)
Grade below		-9.81	10.87	12.10	5.12		-20.97*	1.07	.39	2.47
		(17.98)	(9.64)	(9.62)	(12.55)		(5.37)	(3.27)	(3.31)	(3.23)
Grade above		-5.14	5.55	9.41	8.94		-13.91*	-2.79	-2.50	-1.78
		(10.58)	(8.07)	(8.06)	(9.39)		(4.39)	(2.96)	(2.89)	(2.99)
<i>Student-Level Variables</i>										
Parents know parents	1.73	1.77	1.30	1.31	.70	.54	.62	-.53	-.54	-.87
	(1.42)	(1.36)	(.90)	(.90)	(.87)	(.60)	(.58)	(.52)	(.52)	(.48)
Number of friends nominated		-.64	-.28	-.28	-.32		.72*	.48*	.48*	.19
		(.60)	(.47)	(.47)	(.46)		(.28)	(.24)	(.24)	(.23)
Same Sex		-.04	.72	.70	.33		-1.89*	-1.40	-1.40	-.50
		(2.72)	(1.58)	(1.58)	(1.51)		(.84)	(.75)	(.75)	(.68)
Grade below		-4.62*	-3.55	-3.58	-3.20		-8.28*	-5.21*	-5.22*	-3.95*
		(2.06)	(1.94)	(1.94)	(1.87)		(1.08)	(.87)	(.87)	(.84)
Grade above		-6.01*	-4.58*	-4.58*	-3.09*		-5.37*	-3.73*	-3.73*	-2.99*
		(1.79)	(1.60)	(1.60)	(1.54)		(.76)	(.72)	(.72)	(.64)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓			✓	✓	✓
Region				✓	✓				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓					✓
RANDOM EFFECTS										
School-level variance	27.52	28.30	7.13	6.48	7.37	40.40	38.00	11.64	11.16	9.99
Student-level variance	129.99	128.83	115.25	115.21	103.72	184.31	180.67	142.80	142.79	123.40
Number of schools	95	95	95	95	95	579	579	579	579	579
Number of students	1,660	1,660	1,660	1,660	1,660	8,842	8,842	8,842	8,842	8,842

* p < .05 (two-tailed test)

Table S9. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores Minus 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools

Independent Variable	Catholic					Public				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS										
Constant	6.66	6.69	6.59	6.59	6.63	4.67	4.67	4.71	4.69	4.69
<i>School-Level Variables</i>										
Parents know parents	3.72* (1.50)	4.76* (1.80)	3.32 (1.75)	2.66 (1.98)	-.03 (2.94)	.37 (.69)	.39 (.70)	1.14 (.85)	1.22 (.85)	.95 (.93)
Number of friends nominated		-1.07* (.50)	-.79 (.68)	-.79 (.70)	-.62 (.80)		-.08 (.44)	.08 (.40)	.12 (.40)	.24 (.39)
Same sex		4.42 (2.89)	8.79* (2.41)	8.93* (2.42)	10.01* (3.13)		-.41 (1.67)	-1.12 (1.53)	-1.09 (1.53)	-1.07 (1.49)
Grade below		6.71 (7.40)	12.34* (4.52)	13.17* (4.60)	8.29 (6.03)		-.50 (2.08)	1.18 (1.98)	1.14 (1.97)	1.75 (1.97)
Grade above		4.22 (4.21)	6.14 (3.73)	5.58 (3.81)	4.54 (4.48)		-.19 (1.33)	.67 (1.36)	.62 (1.37)	.23 (1.39)
<i>Student-Level Variables</i>										
Parents know parents	-.07 (.58)	-.08 (.56)	-.06 (.49)	-.06 (.49)	-.13 (.50)	-.24 (.28)	-.23 (.28)	-.40 (.28)	-.40 (.28)	-.43 (.28)
Number of friends nominated		-.37 (.43)	-.34 (.26)	-.34 (.26)	-.37 (.26)		.00 (.18)	-.02 (.18)	-.03 (.18)	-.06 (.18)
Same Sex		1.31 (.88)	1.40 (.86)	1.40 (.86)	1.09 (.86)		-.24 (.36)	-.23 (.36)	-.23 (.36)	-.03 (.35)
Grade below		-.01 (1.22)	-.05 (1.06)	-.05 (1.06)	.07 (1.07)		-.65 (.50)	-.32 (.49)	-.32 (.49)	-.17 (.49)
Grade above		-1.41 (.80)	-1.34 (.88)	-1.34 (.88)	-1.00 (.88)		-.83* (.36)	-.67 (.36)	-.67 (.36)	-.51 (.36)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓			✓	✓	✓
Region				✓	✓				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓					✓
RANDOM EFFECTS										
School-level variance	1.74	1.72	.92	.92	1.06	2.14	2.18	1.80	1.80	1.80
Student-level variance	34.65	34.48	34.48	34.50	33.65	40.86	40.83	40.29	40.29	39.84
Number of schools	95	95	95	95	95	579	579	579	579	579
Number of students	1,660	1,660	1,660	1,660	1,660	8,842	8,842	8,842	8,842	8,842

* p < .05 (two-tailed test)

Table S10. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores Minus 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools, Adjusted for 10th Grade Math Test Scores

Independent Variable	Catholic					Public				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS										
Constant	6.67	6.71	6.56	6.57	6.60	4.64	4.64	4.66	4.65	4.63
<i>School-Level Variables</i>										
Parents know parents	5.05* (1.65)	6.02* (1.96)	4.01* (1.72)	3.14 (1.94)	.25 (2.83)	.75 (.71)	.81 (.72)	1.25 (.83)	1.36 (.83)	1.05 (.91)
Number of friends nominated		-1.23* (.58)	-.85 (.67)	-.79 (.69)	-.60 (.77)		-.08 (.45)	.08 (.39)	.12 (.39)	.26 (.39)
Same sex		4.14 (3.02)	8.61* (2.36)	8.81* (2.38)	9.53* (3.03)		-.41 (1.71)	-.78 (1.58)	-.65 (1.57)	-.45 (1.56)
Grade below		5.50 (7.94)	12.14* (4.42)	13.06* (4.51)	7.79 (5.83)		-1.17 (2.11)	1.16 (1.95)	1.07 (1.95)	1.84 (1.95)
Grade above		3.65 (4.45)	6.10 (3.64)	6.02 (3.74)	5.20 (4.33)		-.63 (1.32)	.38 (1.32)	.35 (1.33)	-.00 (1.34)
<i>Student-Level Variables</i>										
IRT math score in 10 th grade	-.07* (.02)	-.08* (.02)	-.11* (.01)	-.11* (.01)	-.14* (.01)	-.03* (.01)	-.03* (.01)	-.08* (.01)	-.08* (.01)	-.11* (.01)
Parents know parents	.06 (.57)	.07 (.55)	.09 (.48)	.09 (.48)	-.02 (.48)	-.22 (.27)	-.21 (.28)	-.41 (.27)	-.41 (.27)	-.48 (.28)
Number of friends nominated		-.39 (.42)	-.33 (.25)	-.33 (.25)	-.36 (.25)		.02 (.18)	.02 (.18)	.01 (.18)	-.03 (.17)
Same Sex		1.20 (.90)	1.33 (.85)	1.32 (.85)	.99 (.84)		-.29 (.36)	-.32 (.35)	-.32 (.36)	-.08 (.35)
Grade below		-.36 (1.18)	-.45 (1.04)	-.45 (1.04)	-.39 (1.04)		-.89 (.51)	-.70 (.49)	-.70 (.49)	-.58 (.48)
Grade above		-1.76* (.82)	-1.70* (.86)	-1.70* (.86)	-1.29 (.85)		-.97* (.36)	-.91* (.36)	-.91* (.36)	-.78* (.35)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓			✓	✓	✓
Region				✓	✓				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓					✓
RANDOM EFFECTS										
School-level variance	2.21	2.21	.86	.89	.96	2.24	2.29	1.79	1.79	1.75
Student-level variance	33.75	33.57	33.20	33.21	31.76	40.66	40.61	39.52	39.52	38.54
Number of schools	95	95	95	95	95	579	579	579	579	579
Number of students	1,660	1,660	1,660	1,660	1,660	8,842	8,842	8,842	8,842	8,842

* p < .05 (two-tailed test)

Table S11. Coefficients from Multilevel Regression Models of 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools Using Parent Survey Measure of Social Closure

Independent Variable	Catholic					Public				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS										
Constant	48.78	48.77	48.34	48.39	48.35	41.77	41.75	41.56	41.58	41.58
<i>School-Level Variables</i>										
Parents know parents	35.74* (5.99)	33.56* (6.20)	12.17* (5.32)	9.57 (5.11)	5.06 (5.88)	25.21* (2.93)	21.84* (2.70)	4.42* (2.19)	4.02 (2.19)	3.07 (2.21)
Number of friends nominated		-.75 (1.31)	-.61 (.90)	-.11 (.87)	-1.59 (.98)		.21 (.96)	-.38 (.57)	-.26 (.54)	-.46 (.47)
Same sex		-3.20 (6.26)	-1.84 (5.97)	-1.20 (5.83)	-7.10 (4.88)		-7.07 (5.13)	1.77 (3.20)	2.80 (3.05)	3.01 (2.93)
Grade below		-21.81 (12.90)	-5.80 (10.09)	-4.32 (9.59)	.74 (11.45)		-27.90* (5.40)	-2.61 (3.51)	-2.32 (3.46)	1.57 (3.02)
Grade above		-5.03 (8.90)	1.09 (7.33)	2.98 (6.90)	4.00 (6.11)		-21.26* (3.26)	-7.13* (2.29)	-6.89* (2.18)	-3.72 (2.06)
<i>Student-Level Variables</i>										
Parents know parents	4.35* (1.09)	4.26* (1.09)	3.58* (1.06)	3.58* (1.06)	3.58* (1.01)	4.31* (.54)	3.94* (.53)	2.53* (.47)	2.53* (.47)	1.92* (.46)
Number of friends nominated		-.05 (.47)	.25 (.42)	.24 (.42)	.23 (.34)		.66* (.18)	.41* (.16)	.41* (.16)	.14 (.16)
Same Sex		.46 (2.38)	.60 (2.06)	.58 (2.06)	.36 (1.64)		-1.68* (.66)	-1.26* (.58)	-1.26* (.58)	-.67 (.53)
Grade below		-3.42 (1.97)	-2.51 (1.97)	-2.52 (1.97)	-2.29 (1.86)		-7.17* (.79)	-5.08* (.67)	-5.07* (.67)	-3.85* (.64)
Grade above		-3.61* (1.61)	-2.40 (1.64)	-2.40 (1.65)	-1.56 (1.43)		-4.96* (.57)	-3.49* (.52)	-3.49* (.52)	-2.19* (.48)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓			✓	✓	✓
Region				✓	✓				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓					✓
RANDOM EFFECTS										
School-level variance	18.10	18.39	8.30	7.94	8.49	32.40	27.61	9.15	8.54	7.17
Student-level variance	115.90	115.49	104.17	104.19	96.24	157.70	154.40	124.59	124.62	108.93
Number of schools	95	95	95	95	95	580	580	580	580	580
Number of students	1,918	1,918	1,918	1,918	1,918	12,025	12,025	12,025	12,025	12,025

* p < .05 (two-tailed test)

Table S12. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools Using Parent Survey Measure of Social Closure

Independent Variable	Catholic					Public				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS										
Constant	55.76	55.78	55.46	55.54	55.55	47.39	47.43	47.86	47.88	47.87
<i>School-Level Variables</i>										
Parents know parents	32.45* (5.96)	32.35* (7.00)	-5.56 (6.05)	2.46 (6.10)	-6.26 (8.48)	21.22* (3.13)	20.83* (3.03)	4.65* (2.17)	4.93* (2.17)	3.46 (2.19)
Number of friends nominated		-2.59 (1.46)	-1.55 (1.60)	-82 (1.56)	-61 (1.75)		.72 (1.19)	.26 (.70)	.33 (.67)	.55 (.66)
Same sex		1.09 (7.53)	7.81 (5.41)	8.43 (5.22)	6.81 (6.51)		2.14 (5.00)	3.91 (3.47)	5.12 (3.33)	5.02 (3.24)
Grade below		-3.63 (17.63)	11.72 (10.04)	13.54 (9.80)	6.00 (12.33)		-18.44* (5.49)	1.42 (3.27)	.94 (3.32)	2.70 (3.24)
Grade above		-2.54 (11.81)	4.88 (8.31)	9.41 (8.17)	8.51 (9.33)		-15.08* (4.32)	-3.13 (2.98)	-2.78 (2.91)	-2.05 (2.99)
<i>Student-Level Variables</i>										
Parents know parents	5.28* (1.26)	5.15* (1.26)	4.39* (1.11)	4.39* (1.11)	4.00* (1.10)	4.23* (.67)	4.07* (.66)	2.31* (.59)	2.31* (.59)	1.95* (.58)
Number of friends nominated		-.56 (.63)	-.22 (.47)	-.23 (.47)	-.30 (.45)		.70* (.28)	.47* (.24)	.48* (.24)	.20 (.23)
Same Sex		.10 (2.67)	.79 (1.57)	.77 (1.57)	.38 (1.51)		-1.99* (.83)	-1.56* (.75)	-1.55* (.75)	-.68 (.67)
Grade below		-4.04 (2.14)	-3.06 (1.93)	-3.09 (1.93)	-2.82 (1.86)		-8.21* (1.07)	-5.22* (.87)	-5.23* (.87)	-4.01* (.84)
Grade above		-6.04* (1.77)	-4.63* (1.60)	-4.63* (1.60)	-3.13* (1.53)		-5.24* (.76)	-3.67* (.72)	-3.67* (.72)	-2.95* (.64)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓			✓	✓	✓
Region				✓	✓				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓					✓
RANDOM EFFECTS										
School-level variance	27.32	28.54	8.08	6.92	7.27	39.11	36.62	11.58	11.11	10.01
Student-level variance	128.63	127.54	114.25	114.24	102.88	182.97	179.45	142.40	142.39	123.16
Number of schools	95	95	95	95	95	579	579	579	579	579
Number of students	1,660	1,660	1,660	1,660	1,660	8,842	8,842	8,842	8,842	8,842

* p < .05 (two-tailed test)

Table S13. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores Minus 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools Using Parent Survey Measure of Social Closure

Independent Variable	Catholic					Public				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS										
Constant	6.63	6.65	6.58	6.59	6.64	4.66	4.66	4.70	4.69	4.69
<i>School-Level Variables</i>										
Parents know parents	3.82 (2.08)	5.80* (2.83)	2.58 (2.76)	1.88 (2.86)	-4.24 (4.03)	1.22 (.96)	1.21 (.95)	1.82 (1.05)	1.80 (1.05)	1.77 (1.12)
Number of friends nominated		-.94* (.43)	-.83 (.70)	-.77 (.70)	-.67 (.80)		-.05 (.44)	.15 (.40)	.18 (.40)	.30 (.39)
Same sex		4.34 (2.92)	8.98* (2.48)	9.18* (2.46)	9.93* (3.11)		-.36 (1.66)	-.96 (1.51)	-.91 (1.50)	-.96 (1.45)
Grade below		7.32 (8.19)	12.80* (4.64)	13.89* (4.66)	8.40 (5.93)		-.40 (2.03)	1.34 (1.96)	1.35 (1.95)	1.86 (1.93)
Grade above		4.41 (4.46)	6.02 (3.78)	5.65 (3.84)	4.34 (4.45)		-.25 (1.32)	.55 (1.37)	.52 (1.38)	.10 (1.38)
<i>Student-Level Variables</i>										
Parents know parents	.35 (.63)	.35 (.62)	.34 (.61)	.34 (.61)	.12 (.63)	.81* (.30)	.80* (.30)	.59 (.31)	.59 (.31)	.58 (.31)
Number of friends nominated		-.37 (.44)	-.34 (.26)	-.34 (.26)	-.37 (.26)		-.00 (.19)	-.02 (.18)	-.02 (.18)	-.05 (.18)
Same Sex		1.31 (.89)	1.41 (.86)	1.40 (.86)	1.08 (.86)		-.29 (.36)	-.30 (.35)	-.30 (.35)	-.10 (.35)
Grade below		.02 (1.22)	-.03 (1.06)	-.03 (1.06)	.07 (1.07)		-.64 (.51)	-.33 (.49)	-.34 (.49)	-.20 (.49)
Grade above		-1.42 (.81)	-1.35 (.88)	-1.35 (.88)	-.99 (.88)		-.80* (.36)	-.66 (.36)	-.66 (.36)	-.50 (.36)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓			✓	✓	✓
Region				✓	✓				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓					✓
RANDOM EFFECTS										
School-level variance	1.85	1.84	1.00	.96	1.02	2.13	2.17	1.79	1.79	1.79
Student-level variance	34.67	34.51	34.48	34.50	33.64	40.81	40.78	40.27	40.27	39.83
Number of schools	95	95	95	95	96	579	579	579	579	579
Number of students	1,660	1,660	1,660	1,660	1,660	8,842	8,842	8,842	1,660	1,660

* p < .05 (two-tailed test)

Table S14. Means and Standard Deviations of Primary Variables for Private, Non-Catholic Schools

Variable	Private, Non-Catholic	
	Mean	S.D.
<i>Math Test Scores</i>		
IRT estimated number right (10 th grade)	49.36	13.82
IRT estimated number right (12 th grade)	57.65	14.15
Gain Score (12 th -10 th grade IRT estimated number right)	6.60	6.88
<i>Parents Know Parents (Mean across nominated friends)</i>	0.70	0.33
<i>Student Network Structure</i>		
Number of friends nominated	2.71	0.80
Same sex (Mean across nominated friends)	0.83	0.23
Grade below (Mean across nominated friends)	0.09	0.21
Grade above (Mean across nominated friends)	0.15	0.24
<i>Female</i>	0.51	
<i>Race (White is the reference category)</i>		
Native American	0.01	
Asian	0.06	
Black	0.04	
Hispanic	0.05	
Multiracial	0.06	
<i>Urbanicity (Urban is the reference category)</i>		
Suburban	0.39	
Rural	0.07	
<i>Region (Midwest is the reference category)</i>		
Northeast	0.16	
South	0.44	
West	0.22	
<i>Size of 10th grade enrollment</i>	67.83	49.71
<i>Learning Disability (as reported by parents)</i>	0.07	
<i>Family Background</i>		
Mother's education (in years)	15.06	2.38
Father's education (in years)	15.70	2.86
SEI score of mother's occupation in 2002 (GSS 1989 coding)	50.46	12.84
SEI score of father's occupation in 2002 (GSS 1989 coding)	51.69	12.22
Family income (natural log)	11.18	0.89
Two-parent family	0.84	

Notes: N = 1,382 students enrolled in 76 non-Catholic private schools for all variables except 12th grade math test scores and math gain scores. For these two variables, N = 1,069 students enrolled in 72 non-Catholic private school.

Table S15. Means and Standard Deviations of Additional Variables for Model 5 in Table S16 for Private, Non-Catholic Schools

Variable	Private, Non-Catholic	
	Mean	S.D.
<i>Behavior</i>		
Number times suspended this year	0.12	0.68
Number times on probation this year	0.10	0.56
Ever held back prior to this year	0.09	0.26
Repeat 4 th grade	0.01	0.06
<i>Educational expectations for student(in years)</i>		
Student	17.39	2.01
Mother	17.08	1.93
Father	17.15	2.02
<i>Factors important in choosing future college</i>		
Curriculum important	1.27	0.43
Athletics important	2.52	0.60
Low crime rates important	1.13	0.33
Academics important	1.19	0.38
<i>Tracking characteristics of school</i>		
Percent college prep	81.92	29.98
Percent remedial reading	1.45	4.27
Percent remedial math	1.31	4.32
<i>Parental involvement in school organizations</i>		
Parent belongs to parent-teacher organization	0.46	0.46
Parent attends parent-teacher org meetings	0.53	0.45
Parent takes part in parent-teacher org activities	0.57	0.45
Parent volunteers at school	0.62	0.44
Parent attends other organization	0.42	0.45
<i>Parental involvement and attitudes about school</i>		
Parents invest in community	0.74	0.39
School assigns too little homework	1.79	0.58
Children challenged at school	3.21	0.59
Child works hard	3.19	0.63
School prepares students for college	3.39	0.59
<i>Number of years parents lived in community</i>	10.53	7.20

Notes: N = 1,382 students enrolled in 76 non-Catholic private schools for all variables.

Table S16. Coefficients from Multilevel Regression Models of 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools (for Private, Non-Catholic Schools)

Independent Variable	Private, Non-Catholic				
	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS					
Constant	45.96	46.96	47.30	47.08	47.05
<i>School-Level Variables</i>					
Parents know parents	11.43 (10.31)	7.67 (8.37)	-6.15 (6.29)	-3.94 (6.23)	-13.19 (9.43)
Number of friends nominated		-1.25 (2.54)	1.27 (1.22)	.46 (1.34)	3.05 (2.83)
Same sex		-3.63 (13.80)	-.01 (6.94)	-6.31 (7.18)	-3.55 (14.06)
Grade below		-20.77* (6.07)	12.81* (5.03)	5.59 (5.39)	18.62 (10.13)
Grade above		-30.44* (5.79)	-12.85 (7.61)	-17.02* (7.94)	-2.14 (11.33)
<i>Student-Level Variables</i>					
Parents know parents	.21 (1.33)	.22 (1.35)	.22 (1.23)	.22 (1.23)	.67 (.97)
Number of friends nominated		.05 (.68)	.45 (.70)	.45 (.70)	.42 (.42)
Same Sex		.81 (2.06)	-.14 (1.83)	-.15 (1.83)	.70 (1.28)
Grade below		1.06 (2.73)	.76 (2.46)	.76 (2.46)	1.61 (1.60)
Grade above		-1.88 (1.48)	-1.92 (1.31)	-1.95 (1.30)	-1.23 (1.34)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓
Region				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓
RANDOM EFFECTS					
School-level variance	97.62	59.25	31.81	28.72	17.20
Student-level variance	121.33	121.34	106.57	106.59	97.23
Number of schools	76	76	76	76	76
Number of students	1,382	1,382	1,382	1,382	1,382

* p < .05 (two-tailed test)

Table S17. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools (for Private, Non-Catholic Schools)

Independent Variable	Private, Non-Catholic				
	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS					
Constant	54.04	54.40	54.81	54.67	54.56
<i>School-Level Variables</i>					
Parents know parents	-8.71 (10.27)	-10.56 (6.58)	-11.07 (6.17)	-9.30 (6.30)	-12.80 (7.97)
Number of friends nominated		5.26 (5.19)	2.22 (1.71)	1.64 (1.81)	1.43 (2.69)
Same sex		17.24 (10.71)	-.88 (9.46)	-2.87 (9.59)	-9.21 (13.59)
Grade below		-19.58* (4.84)	5.95 (7.40)	3.72 (7.79)	17.92 (11.02)
Grade above		-26.46* (8.13)	-16.51* (6.68)	-18.37* (6.78)	-5.38 (8.10)
<i>Student-Level Variables</i>					
Parents know parents	-.51 (1.63)	-.43 (1.68)	-.30 (1.17)	-.31 (1.17)	-.16 (1.15)
Number of friends nominated		-1.37 (1.07)	-.68 (.55)	-.68 (.55)	-.65 (.54)
Same Sex		.69 (2.04)	.16 (1.57)	.14 (1.58)	.70 (1.54)
Grade below		-3.00 (2.69)	-2.87 (2.04)	-2.86 (2.04)	-2.16 (1.98)
Grade above		-4.07* (2.04)	-3.11 (1.68)	-3.12 (1.68)	-1.81 (1.63)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓
Region				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓
RANDOM EFFECTS					
School-level variance	115.35	81.40	27.84	27.82	9.35
Student-level variance	127.76	126.01	109.68	109.70	100.09
Number of schools	72	72	72	72	72
Number of students	1,069	1,069	1,069	1,069	1,069

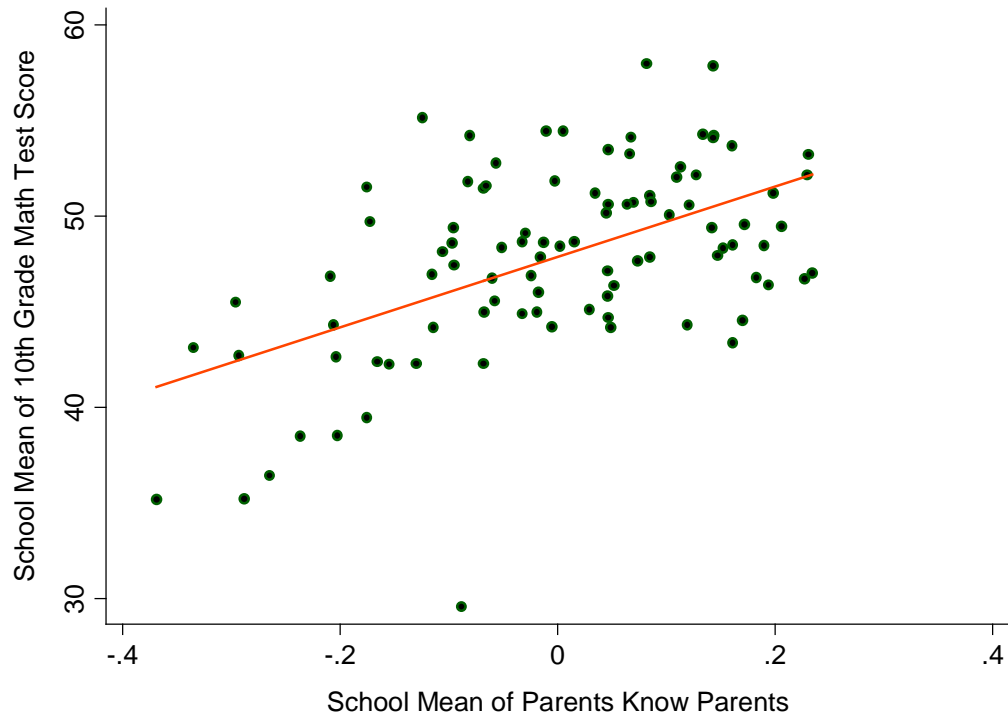
* p < .05 (two-tailed test)

Table S18. Coefficients from Multilevel Regression Models of 12th Grade Math Test Scores Minus 10th Grade Math Test Scores on Network Characteristics of School Communities and Students Within Schools (for Private, Non-Catholic Schools)

Independent Variable	Private, Non-Catholic				
	Model 1	Model 2	Model 3	Model 4	Model 5
FIXED EFFECTS					
Constant	6.37	6.25	6.11	6.21	6.10
<i>School-Level Variables</i>					
Parents know parents	1.02 (2.56)	1.16 (2.35)	1.51 (2.80)	.84 (2.91)	.69 (4.48)
Number of friends nominated		-1.14 (1.05)	-.66 (.75)	-.67 (.79)	-2.65 (1.49)
Same sex		2.79 (3.52)	-2.70 (4.15)	-2.30 (4.25)	-14.36 (7.59)
Grade below		-.70 (3.67)	.06 (3.40)	1.35 (3.60)	1.13 (6.16)
Grade above		-3.42 (2.70)	-.62 (2.98)	.11 (3.07)	-3.40 (4.56)
<i>Student-Level Variables</i>					
Parents know parents	-.89 (.67)	-.63 (.67)	-.59 (.71)	-.58 (.71)	-.79 (.73)
Number of friends nominated		-1.29* (.45)	-1.23* (.34)	-1.24* (.34)	-1.18* (.34)
Same Sex		1.18 (.79)	1.16 (.96)	1.17 (.96)	1.00 (.97)
Grade below		-1.76 (1.46)	-1.69 (1.24)	-1.70 (1.24)	-1.93 (1.25)
Grade above		.77 (1.16)	1.19 (1.02)	1.19 (1.02)	1.18 (1.03)
Sex, Race, SES, Learning disability, Urbanicity, School size			✓	✓	✓
Region				✓	✓
Behavior, Educational expectations, Factors in choosing college, Tracking, Parental involvement and attitudes					✓
RANDOM EFFECTS					
School-level variance	4.86	4.36	3.81	3.93	2.40
Student-level variance	41.43	40.89	40.80	40.76	40.20
Number of schools	72	72	72	72	72
Number of students	1,069	1,069	1,069	1,069	1,069

* p < .05 (two-tailed test)

(a)



(b)

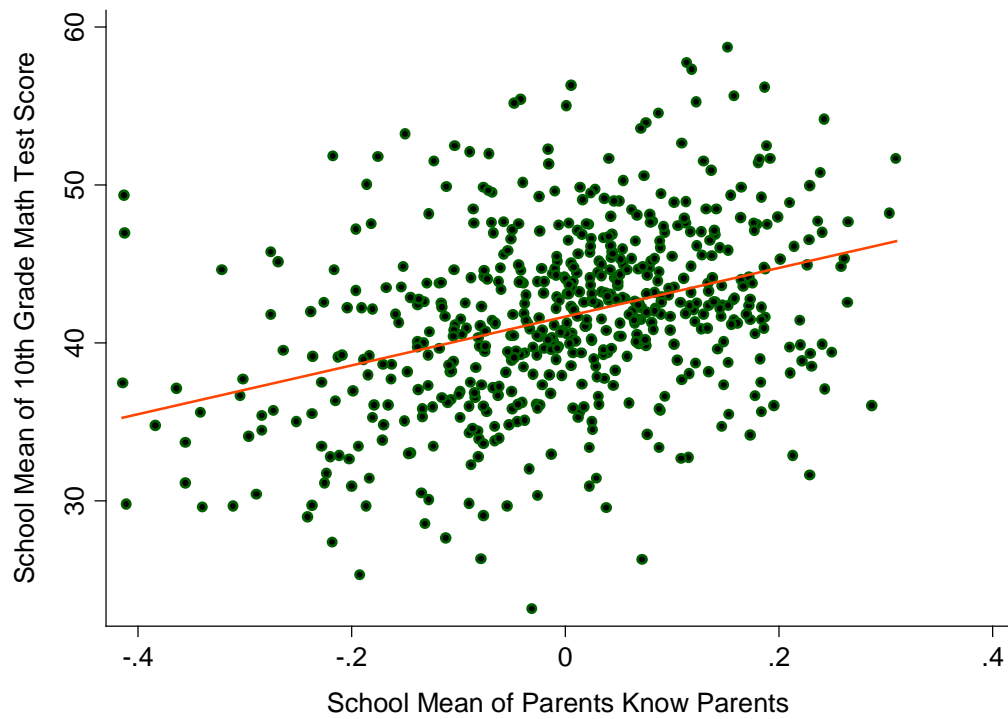
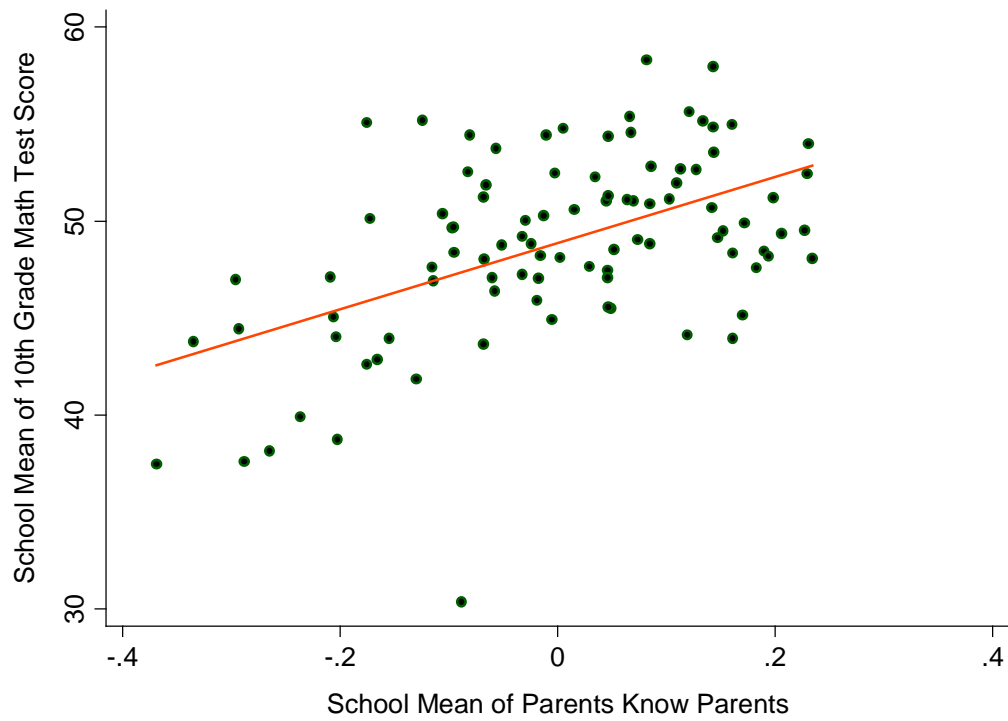


Figure S1. Partial Plots of School Achievement by School-Level of Social Closure for (a) Catholic schools and (b) Public Schools (from Model 1 in Table 2, using EB residuals for each school). (Note: *Parents know parents* is centered around its mean value in each school sector, .67 and .61 respectively.)

(a)



(b)

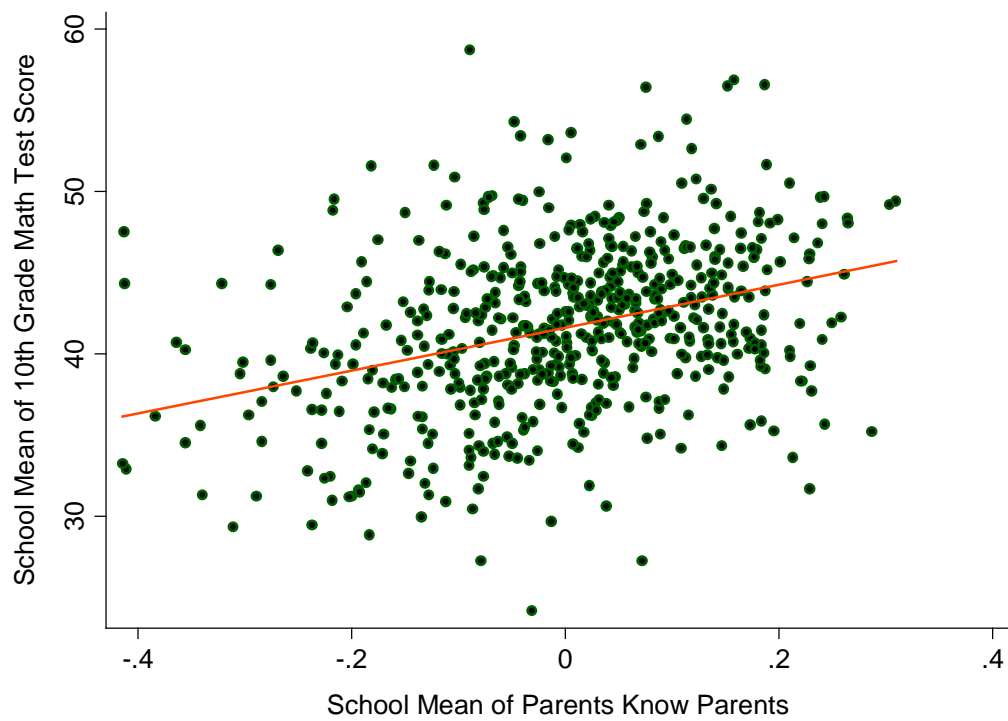


Figure S2. Partial Plots of School Achievement by School-Level of Social Closure for (a) Catholic schools and (b) Public Schools (from Model 2 in Table 2, using EB residuals for each school). (Note: *Parents know parents* is centered around its mean value in each school sector, .67 and .61 respectively.)

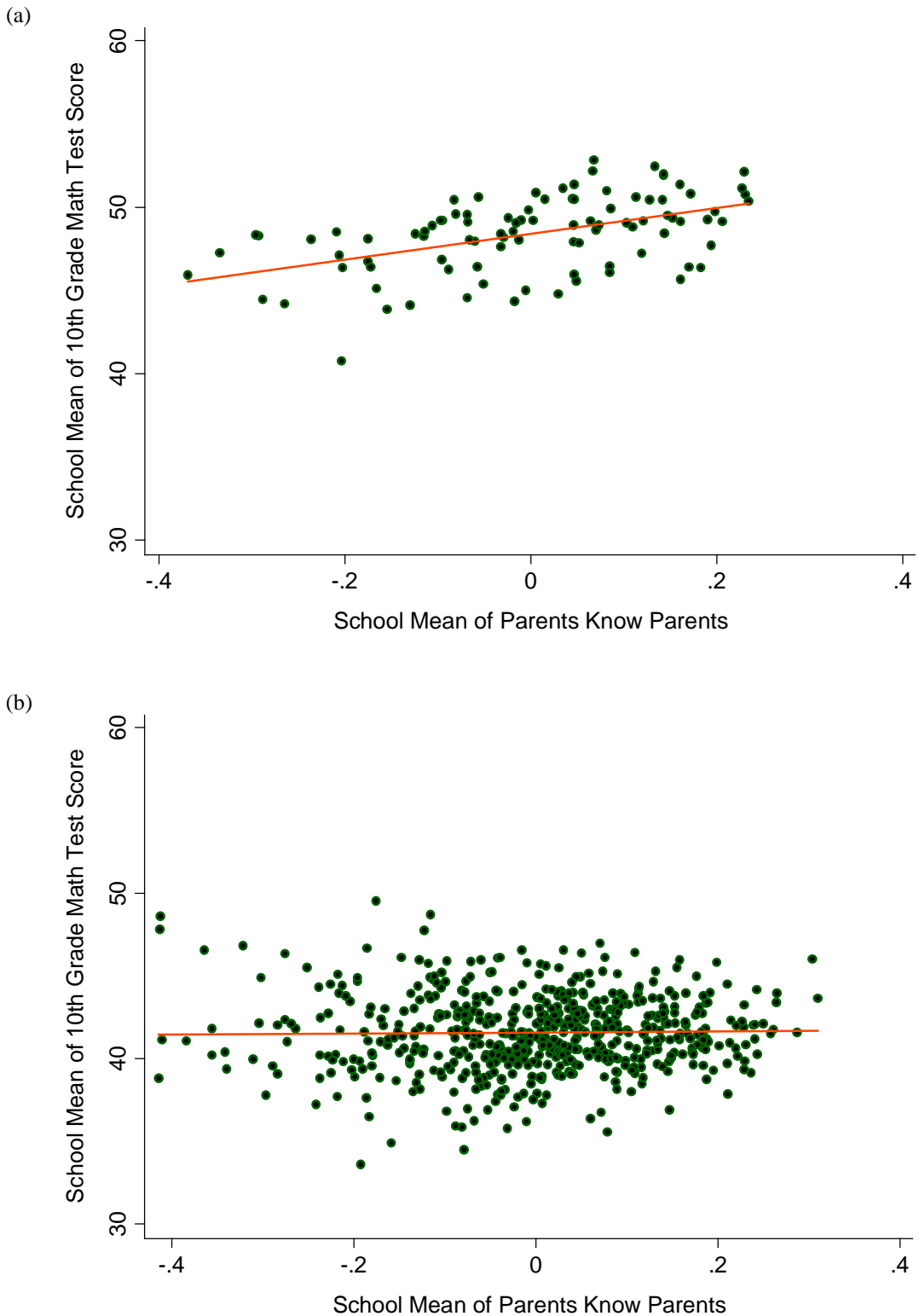
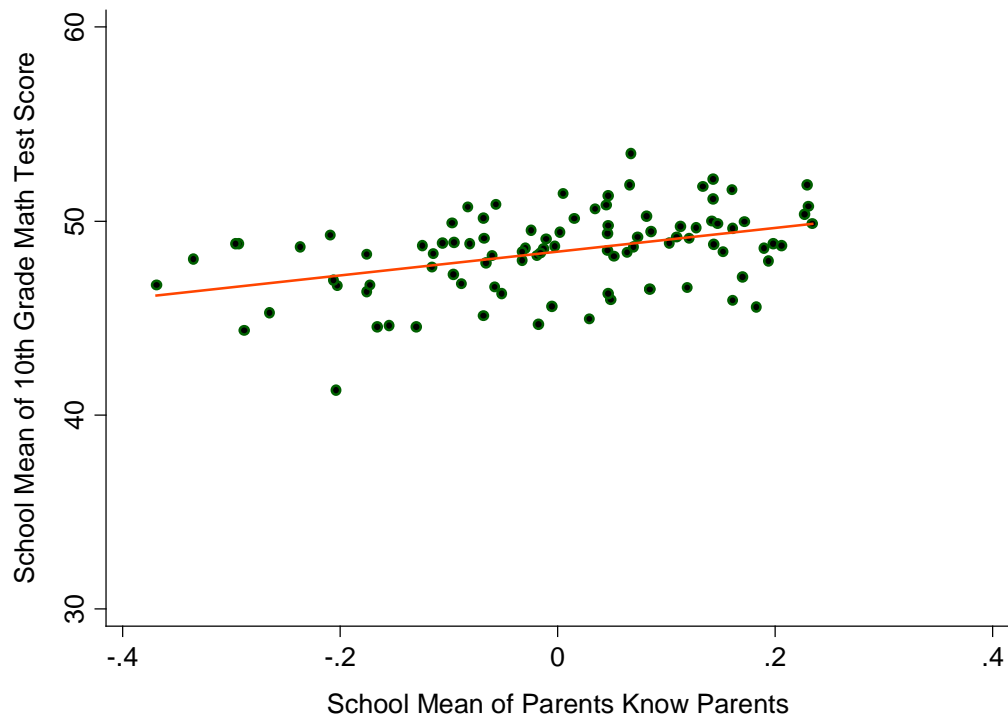


Figure S3. Partial Plots of School Achievement by School-Level of Social Closure for (a) Catholic schools and (b) Public Schools (from Model 3 in Table 2, using EB residuals for each school). (Note: *Parents know parents* is centered around its mean value in each school sector, .67 and .61 respectively.)

(a)



(b)

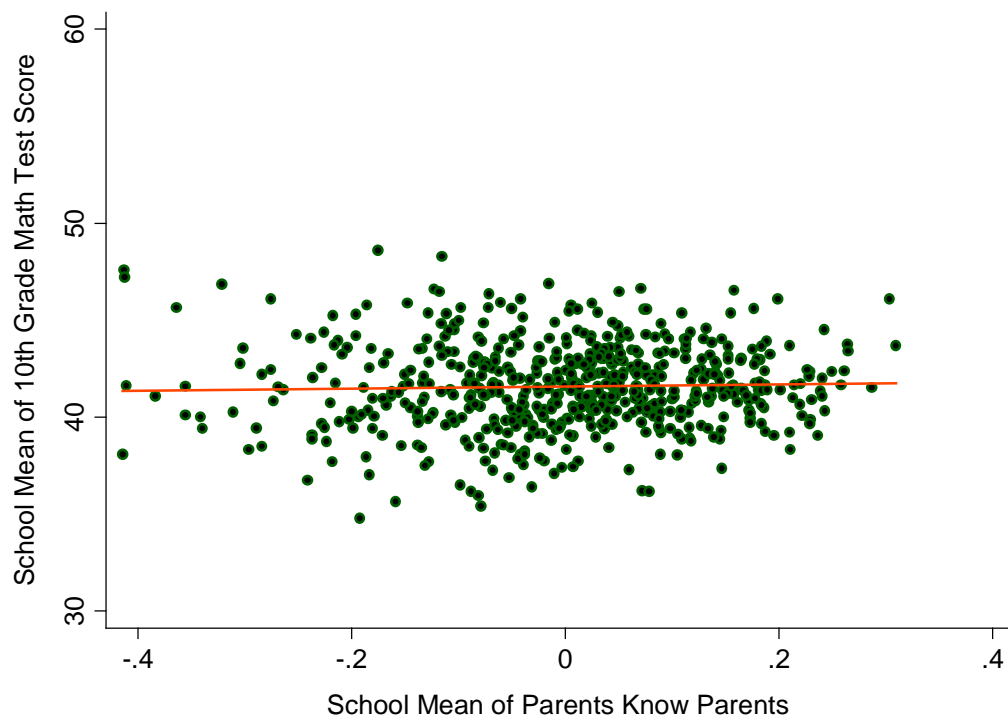
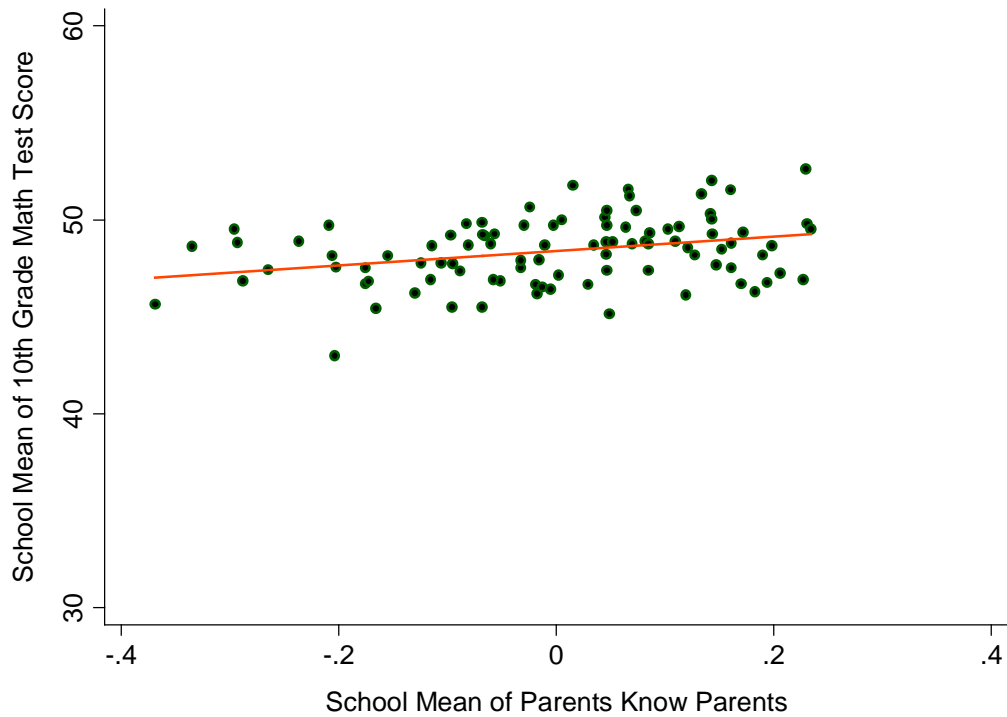


Figure S4. Partial Plots of School Achievement by School-Level of Social Closure for (a) Catholic schools and (b) Public Schools (from Model 4 in Table 2, using EB residuals for each school). (Note: *Parents know parents* is centered around its mean value in each school sector, .67 and .61 respectively.)

(a)



(b)

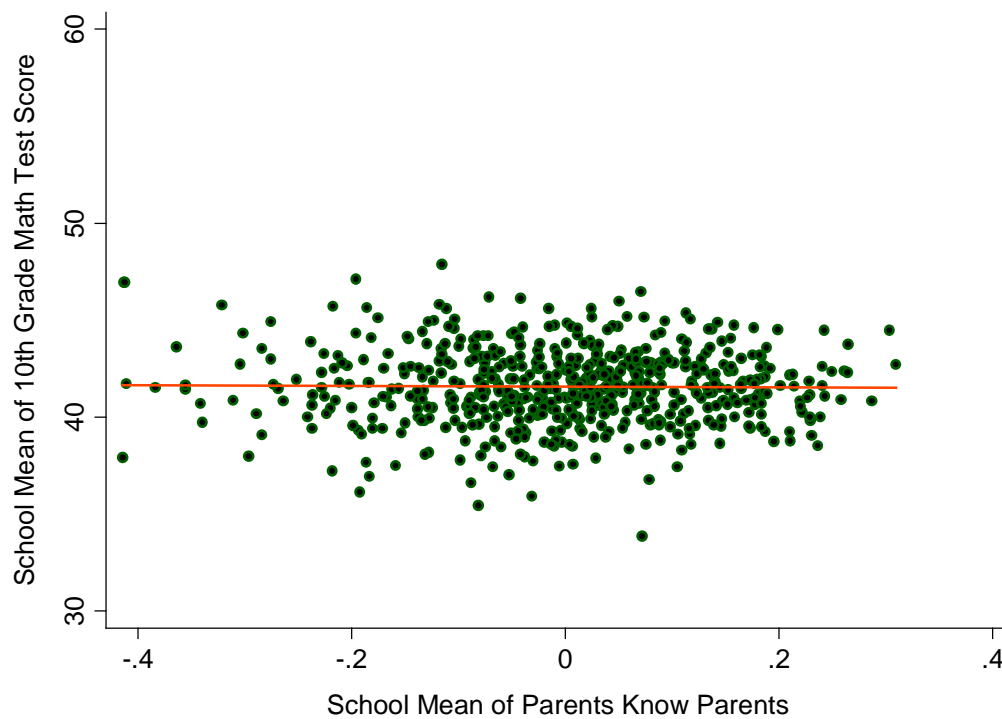


Figure S5. Partial Plots of School Achievement by School-Level of Social Closure for (a) Catholic schools and (b) Public Schools (from Model 5 in Table 2, using EB residuals for each school). (Note: *Parents know parents* is centered around its mean value in each school sector, .67 and .61 respectively.)