

# Supplementary Information for

## Large Studies Reveal How Reference Bias Limits Policy Applications of Self-Report Measures

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### This PDF file includes:

Supplementary text

Figs. S1 to S3

Tables S1 to S21

Legends for Dataset S1 to S2

SI References

### Other supplementary materials for this manuscript include the following:

Datasets S1 to S2

**List of Figures**

S1 Details about the construction of the near-peer and far-peer GPA variables. A. Histograms of the proportion of peers within each school that constituted near (blue) and far (red) peer variables. B. Histograms of the absolute number of peers within each school that constituted near (blue) and far (red) peer variables. C. Example similarity matrix depicting the number of shared core courses between any two students. Each colored square is a pair of students. The diagonal represents the number of core courses each student is taking. Lighter colors represent more shared core courses. . . . . 7

S2 Within- and between-school variation in conscientiousness and self-regulation standards. Each black dot is an individual student, arranged in vertical stacks, each of which represents a school. The red dots are the school-wide means for each variable. . . . . 7

S3 In the Academic Diligence Task (1), students choose between “Do math” or “Play game or watch movie.” If they click “Do math,” they solve single-digit subtraction problems. If they instead click “Play game or watch movie,” a pull-down menu is displayed that contains various video clips or the option to play the video game Tetris. At any point the students can toggle between math or entertainment, but the program restricts engagement to one activity at a time. Figure reproduced with permission from Galla et al. (1). . . . . 16

**List of Tables**

S1 Demographic variables included as controls in OLS models in Study 1. . . . . 3

S2 Descriptive statistics, bivariate correlations, and partial correlations for Study 1 . . . . . 3

S3 OLS regression models predicting self-reported grit from self and peer academic performance in Study 1 . . . . 4

S4 Subgroup analyses by range of individual GPA in Study 1 . . . . . 4

S5 Subgroup analyses by individual performance quintiles in Study 1 . . . . . 5

S6 Subgroup analyses by gender, school type, and mother’s education in Study 1 . . . . . 5

S7 Subgroup analyses by school size tertiles in Study 1 . . . . . 6

S8 Means, standard deviations, and correlation coefficients among the study variables in Study 2 . . . . . 8

S9 Differences across schools and intraclass correlation coefficients in Study 2 . . . . . 8

S10 OLS regression models predicting self-reported conscientiousness and self-regulation standards, respectively, in Study 2 . . . . . 9

S11 Subgroup analyses by gender in Study 2 . . . . . 10

S12 Subgroup analyses by grade in Study 2 . . . . . 11

S13 Subgroup analyses by eligibility for free or reduced priced meals status in Study 2 . . . . . 12

S14 Subgroup analyses by race/ethnicity in Study 2 . . . . . 13

S15 Subgroup analyses by English language learner status in Study 2 . . . . . 14

S16 Subgroup analyses by GPA tertiles in Study 2 . . . . . 15

S17 Means, standard deviations, and correlation coefficients in Study 3. . . . . 16

S18 Multilevel logistic regression models predicting college graduation using the full sample in Study 3 . . . . . 17

S19 Models Predicting College Graduation from Self-Reported Grit and Self-Control, and the Academic Diligence Task (untransformed) . . . . . 18

S20 Multilevel logistic regression models predicting college graduation using listwise deletion in Study 3 . . . . . 19

S21 OLS regression models predicting self-reported grit and self-control, and the Academic Diligence Task from peer and own performance in Study 3 (conceptual replication of Studies 1 and 2). . . . . 20

## Supporting Information Text

### 1. Study 1

**Table S1. Demographic variables included as controls in OLS models in Study 1.**

Question
Gender
How old are you?
Marital status
Does your mother speak an indigenous language or dialect?
Does your father speak an indigenous language or dialect?
Do you live with your mother?
Do you live with your father?
When you have an academic doubt, do you have someone to help you?
What is the level of education reached by your mother (even if she passed away)?
What is the level of education reached by your father (even if he passed away)?
How many books are there in your house? (Don't include magazines, newspapers, or textbooks.)
In the last 2 years, how many times have you gone on vacation within the Mexican Republic?
How many states of the Mexican Republic have you visited as a tourist?
At home, do you have a conventional telephone (landline)?
At home, do you have a cell phone?
At home, do you have a washing machine?
At home, do you have a refrigerator?
At home, do you have a gas stove?
At home, do you have a microwave oven?
At home, do you have cable or satellite TV?
At home, do you have Internet?
How many DVD players are there in your house?
How many computers are there in your house?
How many televisions are there in your house?
How many cars are there in your house?

**Table S2. Descriptive statistics, bivariate correlations, and partial correlations for Study 1**

	1	2	3	4	5	6	7	8	9	10	11	12
<i>Own</i>												
1. Grit		0.28***	0.25***	0.25***	0.13***	0.15***	0.12***	-0.02***	-0.01***	-0.03***	0.01**	0.01***
2. Overall GPA	0.26***		0.61***	0.57***	0.36***	0.36***	-0.01***	0.03***	0.02***	0.02***	0.00*	0.00
3. Math GPA	0.24***	0.65***		0.43***	0.42***	0.29***	0.00*	0.02***	0.04***	0.01***	0.01*	0.00
4. Verbal GPA	0.25***	0.61***	0.46***		0.20***	0.30***	-0.02***	0.02***	0.01***	0.04***	0.01***	0.01***
5. Math test score	0.14***	0.29***	0.36***	0.19***		0.53***	0.01**	0.01**	0.01***	0.01***	0.13***	0.07***
6. Reading test score	0.16***	0.31***	0.27***	0.29***	0.63***		0.01***	0.00	0.00	0.01***	0.07***	0.11***
<i>Peers'</i>												
7. Grit	0.21***	0.05***	0.05***	0.08***	0.12***	0.14***		0.01***	0.04***	-0.09***	0.08***	0.12***
8. Overall GPA	0.03***	0.45***	0.31***	0.30***	0.04***	0.07***	0.13***		0.58***	0.59***	0.18***	0.15***
9. Math GPA	0.03***	0.37***	0.36***	0.26***	0.08***	0.09***	0.14***	0.83***		0.37***	0.20***	0.12***
10. Verbal GPA	0.05***	0.35***	0.24***	0.39***	0.10***	0.14***	0.22***	0.77***	0.65***		0.16***	0.22***
11. Math test score	0.05***	0.04***	0.05***	0.07***	0.55***	0.46***	0.22***	0.08***	0.15***	0.18***		0.59***
12. Reading test score	0.06***	0.06***	0.07***	0.11***	0.49***	0.51***	0.28***	0.14***	0.19***	0.27***	0.89***	
<i>M</i>	3.72	8.38	8.05	8.70	0.10	0.10	3.72	8.38	8.05	8.70	0.10	0.10
<i>SD</i>	0.56	0.73	1.11	0.85	1.00	1.01	0.13	0.33	0.42	0.34	0.56	0.52
<i>N</i>	206,589	210,423	201,445	190,658	211,255	211,255	206,589	210,423	201,445	190,658	211,255	211,255

*Notes.* Bivariate correlations under diagonal. Partial correlations controlling for school dummy variables shown above the diagonal. Missing data was handled with pairwise deletion.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

**Table S3. OLS regression models predicting self-reported grit from self and peer academic performance in Study 1**

	Overall GPA	Math GPA	Language GPA	Math Test Score	Reading Test Score
Own performance	0.427*** (0.005)	0.233*** (0.004)	0.308*** (0.004)	0.163*** (0.003)	0.156*** (0.004)
Peer performance	-0.245*** (0.051)	-0.133*** (0.028)	-0.196*** (0.039)	-0.096*** (0.022)	-0.062** (0.022)
R <sup>2</sup>	0.124	0.110	0.109	0.071	0.071
N	205,901	197,139	186,551	206,589	206,589

*Notes.* All OLS regression models include high school fixed effects, year dummies, and controls for student characteristics. Robust standard errors clustered by high school. The number of observations differs across regressions because of missing values. Own and Peer performance refer to Overall GPA, Math GPA, Language GPA, Math Test Score, and Reading Test Score, respectively, depending on the model. For example, the first column summarises an OLS regression model predicting self-reported grit from own overall GPA ( $\beta = 0.427$ ) and peer overall GPA ( $\beta = -0.245$ ).  
\* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S4. Subgroup analyses by range of individual GPA in Study 1**

Individual GPA Range	Peer-Average GPA	Peer-Average Language GPA	Peer-Average Math GPA
<6		0.599 (1.250)	0.211 (0.176)
6.0 - 6.4	0.744 (0.855)	-0.511 (0.374)	-0.101 (0.067)
6.5 - 6.9	0.193 (0.303)	-0.016 (0.288)	-0.093 (0.093)
7.0 - 7.4	-0.132 (0.132)	-0.250* (0.124)	-0.162** (0.061)
7.5 - 7.9	-0.172 (0.088)	-0.158 (0.109)	-0.136** (0.065)
8.0 - 8.4	-0.224** (0.074)	-0.140** (0.058)	-0.141** (0.051)
8.5 - 8.9	-0.312*** (0.088)	-0.229** (0.072)	-0.125** (0.062)
9.0 - 9.4	-0.459*** (0.102)	-0.280*** (0.075)	-0.324*** (0.063)
9.5 - 9.9	-0.126 (0.153)	-0.241 (0.130)	-0.112 (0.114)
10	-0.937 (0.948)	-0.125 (0.118)	0.095 (0.113)

*Notes.* Models additionally include parameters for individuals own GPA, controls for student characteristics, and fixed effects for school and class year, not shown. Robust standard errors clustered by high school. Each cell summarises a model, with the coefficient being shown is the effect of peer performance (operationalized as the column header), in the particular subset of the data specified by the row (e.g., the  $\beta = 0.599$  in the second column and first row is the effect of peer-average language GPA on self-reported grit in the subset of students who reported a Language GPA of 6 or lower).

\* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S5. Subgroup analyses by individual performance quintiles in Study 1**

Individual Test Score Quintile	Math Test Score	Reading Test Score
Bottom 20%	-0.062 (0.043)	-0.037 (0.039)
Quintile 2	-0.031 (0.041)	-0.040 (0.042)
Quintile 3	-0.106** (0.040)	-0.064 (0.039)
Quintile 4	-0.130** (0.041)	-0.033 (0.040)
Top 20%	-0.102* (0.050)	-0.100 (0.054)

*Notes.* Models additionally include parameters for individuals own test scores, controls for student characteristics, and fixed effects for school and class year, not shown. Robust standard errors clustered by high school. Each cell summarises a model, with the coefficient being shown is the effect of peer performance (operationalized as the column header), in the particular subset of the data specified by the row (e.g., the  $\beta = 0.062$  in the first column and first row is the effect of peer-average math test score on self-reported grit in the subset of students who reported a score in the bottom 20% of the math test score distribution).

†  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

**Table S6. Subgroup analyses by gender, school type, and mother's education in Study 1**

	Overall GPA		Math GPA		Language GPA		Math Test Score		Reading Test Score	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<b>Student gender: boys (1) vs. girls (2)</b>										
Own performance	0.390*** (0.006)	0.466*** (0.006)	0.222*** (0.004)	0.246*** (0.005)	0.277*** (0.005)	0.342*** (0.006)	0.141*** (0.004)	0.185*** (0.005)	0.135*** (0.004)	0.181*** (0.005)
Peer performance	-0.207** (0.066)	-0.275*** (0.061)	-0.146*** (0.039)	-0.124*** (0.034)	-0.226*** (0.051)	-0.175*** (0.051)	-0.063** (0.029)	-0.135*** (0.029)	-0.055 (0.029)	-0.076** (0.029)
$R^2$	0.112	0.139	0.102	0.121	0.099	0.122	0.064	0.080	0.064	0.080
$n$	95,447	110,400	92,472	104,616	87,218	99,282	95,780	110,755	95,780	110,755
<b>School type: public (1) vs. private (2)</b>										
Own performance	0.421*** (0.005)	0.454*** (0.011)	0.231*** (0.004)	0.241*** (0.007)	0.302*** (0.004)	0.338*** (0.009)	0.161*** (0.004)	0.171*** (0.008)	0.156*** (0.004)	0.157*** (0.006)
Peer performance	-0.255*** (0.059)	-0.242** (0.089)	-0.132*** (0.031)	-0.096 (0.059)	-0.182*** (0.043)	-0.206** (0.076)	-0.101*** (0.024)	-0.078 (0.046)	-0.056* (0.024)	-0.130** (0.044)
$R^2$	0.123	0.135	0.111	0.113	0.108	0.115	0.072	0.073	0.072	0.073
$n$	170,188	35,713	162,280	34,859	153,070	33,481	170,769	35,820	170,769	35,820
<b>Mothers education: less than high school (1) vs. more than high school (2)</b>										
Own performance	0.424*** (0.006)	0.428*** (0.006)	0.236*** (0.004)	0.229*** (0.004)	0.304*** (0.005)	0.311*** (0.005)	0.175*** (0.004)	0.149*** (0.005)	0.174*** (0.005)	0.138*** (0.005)
Peer performance	-0.207*** (0.062)	-0.251*** (0.071)	-0.072* (0.035)	-0.186*** (0.037)	-0.162*** (0.049)	-0.214*** (0.052)	-0.109*** (0.025)	-0.074*** (0.031)	-0.062* (0.028)	-0.056* (0.029)
$R^2$	0.130	0.124	0.117	0.109	0.116	0.108	0.079	0.069	0.080	0.069
$n$	104,058	100,531	98,866	97,066	93,280	92,127	104,452	100,803	104,452	100,803

*Notes.* All regressions include high school fixed effects, year dummies, and controls for student characteristics not used in the subgroup analyses. Robust standard errors clustered by high school. Own and Peer performance refer to Overall GPA, Math GPA, Language GPA, Math Test Score, and Reading Test Score, respectively, depending on the model. For example, the first column summarises an OLS regression model predicting self-reported grit from own overall GPA ( $\beta = 0.390$ ) and peer overall GPA ( $\beta = -0.207$ ) in the subset of boys. We conducted tests of equality of the regression coefficients (2) for each pair of models (e.g., effect of peer overall GPA for boys and girls), and found that all pairs of coefficients were statistically indistinguishable from each other (all  $p$ s  $> .05$ , after correcting for multiple comparisons with the Benjamini-Hochberg False Discovery Rate correction (3)).

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

**Table S7. Subgroup analyses by school size tertiles in Study 1**

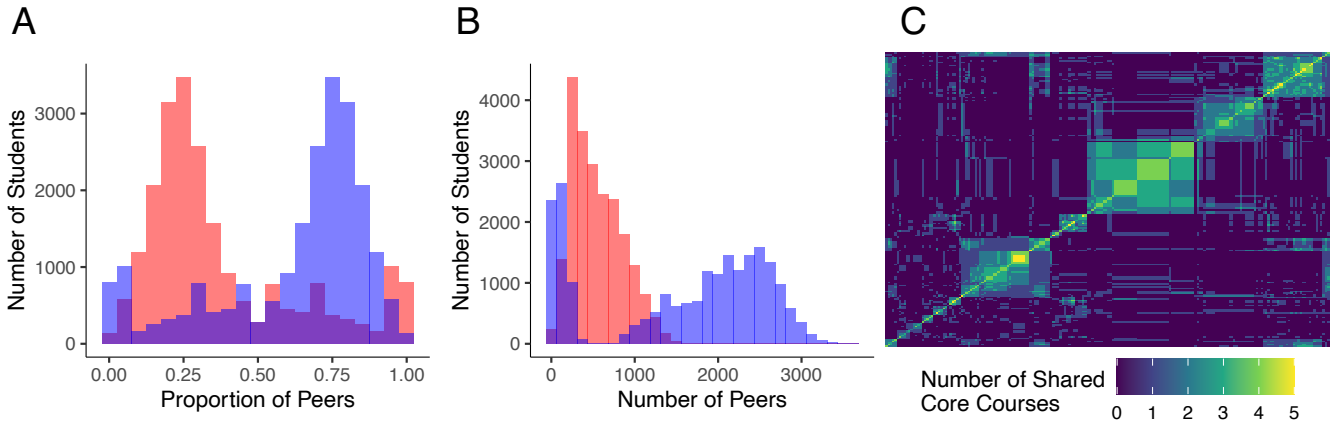
	Smallest third	Middle third	Largest third
<b>Overall GPA</b>			
Own performance	0.436*** (0.012)	0.438*** (0.008)	0.421*** (0.006)
Peer performance	-0.152 (0.085)	-0.118 (0.087)	-0.357*** (0.081)
$R^2$	0.150	0.130	0.115
$n$	19,957	57,676	128,268
<b>Math GPA</b>			
Own performance	0.258*** (0.008)	0.251*** (0.005)	0.222*** (0.005)
Peer performance	-0.060 (0.055)	-0.126** (0.047)	-0.167*** (0.044)
$R^2$	0.138	0.116	0.101
$n$	19,023	54,254	123,862
<b>Language GPA</b>			
Own performance	0.328*** (0.011)	0.325*** (0.007)	0.298*** (0.005)
Peer performance	-0.121 (0.071)	-0.138 (0.074)	-0.270*** (0.058)
$R^2$	0.131	0.115	0.099
$n$	18,250	51,242	117,059
<b>Math Test Scores</b>			
Own performance	0.202*** (0.010)	0.176*** (0.006)	0.151*** (0.004)
Peer performance	-0.158*** (0.040)	-0.090* (0.035)	-0.086* (0.037)
$R^2$	0.094	0.073	0.063
$n$	20,057	57,950	128,582
<b>Reading Test Scores</b>			
Own performance	0.191*** (0.010)	0.175*** (0.006)	0.143*** (0.005)
Peer performance	-0.156** (0.046)	-0.033 (0.035)	-0.054 (0.032)
$R^2$	0.0795	0.075	0.063
$n$	20,057	57,950	128,582

Notes. Models additionally include parameters for individuals own GPA, controls for student characteristics, and fixed effects for school and class year, not shown. Robust standard errors clustered by high school. Each column summarises 5 models, one for each operationalization of own and peer performance (shown in bold headers) predicting self-reported grit. Each column represents a subset of the data based on school size (e.g., the  $\beta = 0.328$  in the first column and first row is the effect of a student's own overall GPA on self-reported grit in the subset of students who attend the third of the smallest schools in our dataset.

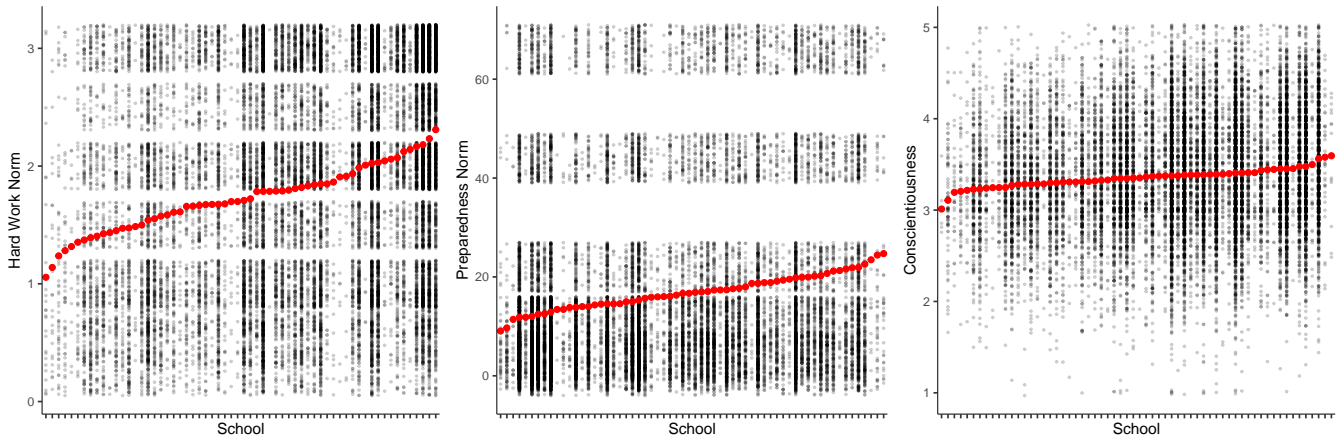
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## 2. Study 2

**A. Note on items assessing self-regulation standards.** We created two standards items for this investigation based on our prior studies of self-regulation in adolescence. Specifically, following the item “I forgot something I needed for class” from the Domain-Specific Impulsivity Scale (4) inspired this question: “If a student in your grade says they ‘sometimes’ forget something they need for class, how often would you guess they mean?” Seven response options ranged from *once a month* to *three times or more per day*. Likewise, hours of homework was a focal measure in “Self-Discipline Outdoes IQ in Predicting Academic Performance of Adolescents” (5) and inspired this question: “If a student in your grade says they did ‘a lot of homework’ on a weeknight, how long would you guess they mean?” Eight response options ranged from 15 minutes to 3 or more hours.



**Fig. S1.** Details about the construction of the near-peer and far-peer GPA variables. A. Histograms of the proportion of peers within each school that constituted near (blue) and far (red) peer variables. B. Histograms of the absolute number of peers within each school that constituted near (blue) and far (red) peer variables. C. Example similarity matrix depicting the number of shared core courses between any two students. Each colored square is a pair of students. The diagonal represents the number of core courses each student is taking. Lighter colors represent more shared core courses.



**Fig. S2.** Within- and between-school variation in conscientiousness and self-regulation standards. Each black dot is an individual student, arranged in vertical stacks, each of which represents a school. The red dots are the school-wide means for each variable.

**Table S8. Means, standard deviations, and correlation coefficients among the study variables in Study 2**

	1	2	3	4	5	6	7
<b>Own</b>							
1. Preparedness norm	-	0.15***	0.06***	0.11***	-	0.15***	-0.10***
2. Hard work norm	0.18***	-	0.09***	0.19***	-	0.25***	-0.14***
3. Conscientiousness	0.06***	0.10***	-	0.25***	-	0.05***	-0.02***
4. Core GPA	0.13***	0.19***	0.24***	-	-	0.42***	-0.28***
<b>Peer</b>							
5. Core GPA (in same school)	0.09***	0.10***	-0.02**	0.22***	-	-	-
6. Core GPA (peers in shared core courses)	0.17***	0.25***	0.03***	0.46***	0.62***	-	-0.54***
7. Core GPA (peers not in shared core courses)	-0.02**	-0.07***	-0.05***	-0.08***	0.55***	0.02***	-
<b>Student demographics</b>							
Female	0.03***	0.12***	0.09***	0.15***	-0.02**	0.04***	-0.04***
Age	0.03***	0.12***	0.09***	-0.04***	-0.10***	0.00	-0.16***
English language learner	-0.04***	-0.05***	0.03***	-0.12***	-0.04***	-0.26***	0.15***
Special education student	0.02*	0.03***	-0.03***	0.03***	0.04***	0.05***	0.04***
Eligible for free or reduced-price meals	-0.12***	-0.16***	-0.01	-0.24***	-0.19***	-0.30***	-0.02*
<b>Race/ethnicity</b>							
Hispanic	-0.05***	-0.06***	-0.02**	-0.11***	0.09***	-0.10***	0.17***
Black, non-Hispanic	-0.09***	-0.10***	0.03***	-0.13***	-0.35***	-0.25***	-0.21***
White, non-Hispanic	0.12***	0.12***	-0.01	0.16***	0.20***	0.27***	0.03***
Other	0.04***	0.07***	0.01	0.13***	0.05***	0.13***	-0.03***
<b>Grade level</b>							
8	-0.06***	-0.17***	-0.07***	0.04***	0.07***	0.07***	0.18***
9	0.03***	0.02*	-0.02***	-0.01	0.05***	-0.10***	0.02*
10	-0.02**	0.01	-0.01	-0.06***	-0.10***	-0.11***	-0.09***
11	0.03***	0.10***	0.05***	0.00	0.00	0.05***	-0.06***
12	0.03***	0.07***	0.06***	0.04***	-0.04***	0.09***	-0.08***
<b>Home language</b>							
English	0.06***	0.05***	0.00	0.06***	0.04***	0.15***	-0.07***
Spanish	-0.06***	-0.06***	0.00	-0.09***	0.03***	-0.14***	0.13***
Other	0.00	0.00	0.01	0.03***	-0.10***	-0.04***	-0.08***
Took survey in winter term (versus fall term)	-0.03***	-0.08***	-0.07***	-0.02**	-0.16***	-0.08***	-0.08***
<i>M</i>	50.13	1.90	3.39	80.97	80.10	80.01	80.60
<i>SD</i>	18.82	0.93	0.62	10.36	2.76	4.18	4.20
<i>N</i>	21,818	21,818	21,818	21,818	21,818	21,818	21,818

Notes. Bivariate correlations appear below the diagonal. Partial Correlations controlling for school dummy variables appear above the diagonal. We do not show partial correlations between peer GPA and other variables because the peer terms are collinear with the school dummy indicators. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

**Table S9. Differences across schools and intraclass correlation coefficients in Study 2**

	Kurtosis	Not controlling for student demographics		Controlling for student demographics		ICC
		$F^2$	$F$	$F^2$	$F$	
Conscientiousness	1.083	0.015	5.562***	0.030	8.905***	0.013
Hard work norm	-0.525	0.079	30.733***	0.118	38.361***	0.077
Preparedness norm	-0.598	0.030	10.904***	0.043	12.724***	0.026
<b>Big Five Conscientiousness items</b>						
Reliable	-0.688	0.010	3.475***	0.038	11.421***	0.008
Irresponsible	-0.587	0.012	4.155***	0.029	8.661***	0.010
Dependable	-0.308	0.009	3.294***	0.021	6.272***	0.007
Careless	-0.177	0.006	2.127***	0.014	4.201***	0.003
Difficulty starting	0.129	0.016	5.824***	0.023	6.633***	0.012
Lazy	0.729	0.011	4.065***	0.021	6.190***	0.010
Tidy	2.007	0.012	4.380***	0.029	8.624***	0.009
Systematic	2.033	0.008	3.002***	0.021	6.225***	0.006
Messy	2.302	0.018	6.473***	0.023	6.793***	0.014
Persistent	2.676	0.009	3.147***	0.017	4.829***	0.007
Disorganized	2.725	0.008	2.910***	0.016	4.693***	0.005
Efficient	4.526	0.007	2.612***	0.014	4.167***	0.005

Notes. Bootstrapped confidence intervals with  $B = 1000$  replications show that there is significantly more between-school variation for both standards (95% CIs [0.071 – 0.096] and [0.025 – 0.041], for hard work and preparedness norms respectively) for self-regulation compared to conscientiousness (95% CI [0.013 – 0.023]).

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Table S10. OLS regression models predicting self-reported conscientiousness and self-regulation standards, respectively, in Study 2

	Conscientiousness					Hard work norm					Preparedness norm				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
<b>Own GPA</b>	0.258*** (0.007)	0.288*** (0.007)	0.258*** (0.012)	0.288*** (0.012)	0.292*** (0.013)	0.183*** (0.007)	0.097*** (0.007)	0.183*** (0.011)	0.097*** (0.008)	0.071*** (0.007)	0.113*** (0.007)	0.058*** (0.008)	0.113*** (0.011)	0.058*** (0.009)	0.045*** (0.009)
School-peer GPA	0.082** (0.030)	0.082 (0.041)	0.082 (0.041)	0.082 (0.041)	0.082 (0.041)	-0.015 (0.030)	-0.015 (0.046)	-0.015 (0.031)	-0.015 (0.033)	-0.015 (0.033)	-0.015 (0.031)	-0.015 (0.033)	-0.015 (0.033)	-0.015 (0.033)	-0.015 (0.033)
Near-peer GPA	-0.065*** (0.011)	-0.065*** (0.015)	-0.065*** (0.016)	-0.065*** (0.016)	-0.059*** (0.016)	0.248*** (0.010)	0.248*** (0.025)	0.248*** (0.025)	0.248*** (0.025)	0.230*** (0.024)	0.230*** (0.024)	0.230*** (0.024)	0.230*** (0.024)	0.230*** (0.024)	0.230*** (0.024)
Far-peer GPA	0.038** (0.012)	0.038** (0.012)	0.038** (0.012)	0.038** (0.012)	0.038** (0.012)	-0.011 (0.011)	-0.011 (0.020)	-0.011 (0.020)	-0.011 (0.020)	-0.025 (0.020)	-0.023 (0.012)	-0.023 (0.012)	-0.023* (0.011)	-0.023* (0.012)	-0.021 (0.012)
<b>Race/ethnicity</b>															
White, non-Hispanic (reference)															
Black, non-Hispanic					0.034*** (0.009)					-0.030** (0.009)					-0.053*** (0.007)
Hispanic					0.018 (0.011)					-0.016 (0.010)					-0.035*** (0.009)
Other race					0.001 (0.008)					0.007 (0.007)					-0.011 (0.007)
<b>Grade level</b>															
Grade 8 (reference)															
Grade 9					-0.030 (0.077)					-0.029 (0.024)					0.059 (0.073)
Grade 10					-0.041 (0.073)					0.024 (0.023)					0.041 (0.067)
Grade 11					-0.034 (0.084)					0.080** (0.028)					0.058 (0.077)
Grade 12					-0.037 (0.070)					0.079** (0.026)					0.045 (0.063)
<b>Student demographics</b>															
Female					0.045*** (0.007)					0.096*** (0.007)					0.019** (0.007)
Eligible for free or reduced priced meals					0.024** (0.007)					-0.043*** (0.010)					-0.032*** (0.006)
English language learner					0.052*** (0.008)					0.036*** (0.007)					0.020* (0.009)
Special education student					-0.026*** (0.007)					0.008 (0.007)					-0.006 (0.007)
Took survey in the winter term					-0.044*** (0.009)					-0.017 (0.014)					0.008 (0.009)
Age					0.105*** (0.015)					-0.115*** (0.017)					-0.016 (0.021)
<b>Home language</b>															
English (reference)															
Spanish					0.008 (0.012)					0.007 (0.010)					-0.015 (0.010)
Other					-0.027* (0.010)					-0.002 (0.006)					-0.0001 (0.008)
<b>N</b>	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818	21,818
<b>R<sup>2</sup></b>	0.079	0.082	0.079	0.082	0.095	0.111	0.143	0.111	0.143	0.159	0.042	0.055	0.042	0.055	0.059

Notes. For each variable we report 5 models. (1) School-wide peers and no student characteristics, (2) Near- and far-peers and no student characteristics, (3) School-wide peers, no student characteristics, and school fixed-effects, (4) Near- and far-peers, no student characteristics, and school fixed-effects, (5) Near- and far-peers, student characteristics, and school fixed-effects. Robust standard errors clustered by school.

Notes. \* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S11. Subgroup analyses by gender in Study 2**

	Male			Female		
	C	HWN	PN	C	HWN	PN
Own GPA	0.288*** (0.013)	0.078*** (0.011)	0.057*** (0.013)	0.293*** (0.015)	0.066*** (0.010)	0.033** (0.010)
Near-peer GPA	-0.089*** (0.019)	0.187*** (0.027)	0.103*** (0.019)	-0.029 (0.018)	0.280*** (0.026)	0.187*** (0.015)
Far-peer GPA	0.011 (0.019)	-0.043* (0.018)	-0.030 (0.018)	0.009 (0.018)	-0.009 (0.027)	-0.010 (0.018)
<b>Race/ethnicity</b>						
White, non-Hispanic (reference)						
Black, non-Hispanic	0.041*** (0.010)	-0.038** (0.013)	-0.052*** (0.014)	0.028 (0.016)	-0.021 (0.013)	-0.053*** (0.012)
Hispanic	0.032 (0.019)	-0.015 (0.012)	-0.046** (0.015)	0.003 (0.017)	-0.017 (0.014)	-0.026* (0.011)
Other race	0.016 (0.009)	0.005 (0.011)	-0.021* (0.010)	-0.015 (0.011)	0.007 (0.008)	-0.002 (0.011)
<b>Grade level</b>						
Grade 8 (reference)						
Grade 9	-0.087 (0.118)	-0.052 (0.080)	0.126 (0.131)	0.030 (0.073)	-0.018 (0.039)	0.009 (0.060)
Grade 10	-0.089 (0.111)	-0.009 (0.076)	0.108 (0.121)	0.007 (0.074)	0.043 (0.034)	-0.009 (0.059)
Grade 11	-0.087 (0.126)	0.064 (0.088)	0.117 (0.137)	0.020 (0.087)	0.082 (0.041)	0.021 (0.071)
Grade 12	-0.067 (0.105)	0.078 (0.072)	0.071 (0.113)	-0.003 (0.074)	0.070 (0.041)	0.037 (0.062)
<b>Student demographics</b>						
Eligible for free or reduced priced meals	0.035*** (0.010)	-0.049** (0.015)	-0.048*** (0.012)	0.014 (0.011)	-0.036*** (0.009)	-0.016 (0.010)
English language learner	0.070*** (0.010)	0.040*** (0.011)	0.037*** (0.010)	0.037*** (0.010)	0.035** (0.011)	0.004 (0.012)
Special education student	-0.034** (0.010)	0.007 (0.008)	-0.006 (0.009)	-0.015 (0.010)	0.010 (0.012)	-0.005 (0.009)
Took survey in the winter term	-0.036* (0.014)	-0.029 (0.015)	0.005 (0.013)	-0.055*** (0.012)	-0.003 (0.017)	0.014 (0.012)
Age	0.090** (0.028)	-0.151*** (0.025)	0.029 (0.021)	0.120*** (0.026)	-0.081*** (0.022)	-0.063 (0.034)
<b>Home language</b>						
English (reference)						
Spanish	0.004 (0.015)	-0.009 (0.013)	-0.010 (0.015)	0.014 (0.015)	0.024 (0.016)	-0.017 (0.012)
Other	-0.025 (0.013)	0.005 (0.008)	-0.010 (0.010)	-0.031* (0.013)	-0.009 (0.009)	0.011 (0.008)
<i>n</i>	10,868	10,868	10,868	10,950	10,950	10,950
<i>F</i> <sup>2</sup>	0.088	0.133	0.053	0.099	0.169	0.074

Notes Estimates calculated by running separate OLS regressions for each subgroup. Robust standard errors clustered by school. C = Conscientiousness, HWN = Hard work norm, PN = Preparedness norm.

\* p < .05, \*\* p < .01, \*\*\* p < .001.

Table S12. Subgroup analyses by grade in Study 2

	Grade 8			Grade 9			Grade 10			Grade 11			Grade 12		
	C	HWN	PN	C	HWN	PN	C	HWN	PN	C	HWN	PN	C	HWN	PN
Own GPA	0.334*** (0.016)	0.091*** (0.013)	0.051** (0.014)	0.328*** (0.014)	0.076*** (0.014)	0.065* (0.025)	0.300*** (0.016)	0.089*** (0.022)	0.042* (0.018)	0.260*** (0.021)	0.044** (0.014)	0.036 (0.018)	0.231*** (0.021)	0.043 (0.027)	0.029* (0.013)
Near-peer GPA	-0.080* (0.033)	0.074 (0.055)	0.079** (0.027)	-0.060* (0.029)	0.203*** (0.039)	0.138*** (0.029)	-0.084* (0.035)	0.102* (0.039)	0.066* (0.031)	-0.020 (0.028)	0.299*** (0.034)	0.187*** (0.022)	-0.055* (0.020)	0.241*** (0.046)	0.162*** (0.022)
Far-peer GPA	0.027 (0.030)	-0.127** (0.042)	-0.061* (0.026)	-0.038 (0.044)	-0.148** (0.046)	-0.076 (0.046)	-0.007 (0.056)	-0.325*** (0.048)	-0.193** (0.053)	0.093 (0.067)	-0.097 (0.077)	0.026 (0.034)	-0.147 (0.093)	-0.015 (0.112)	-0.041 (0.086)
<b>Race/ethnicity</b>															
White, non-Hispanic (reference)															
Black, non-Hispanic	0.041* (0.020)	-0.034 (0.023)	-0.061*** (0.015)	0.036 (0.021)	-0.002 (0.018)	-0.044* (0.017)	0.024 (0.017)	-0.066** (0.018)	-0.056** (0.020)	0.045* (0.020)	-0.018 (0.020)	-0.049** (0.017)	0.014 (0.025)	-0.034 (0.035)	-0.030 (0.029)
Hispanic	0.011 (0.026)	-0.002 (0.023)	-0.035 (0.022)	0.001 (0.021)	0.006 (0.021)	-0.052* (0.024)	0.012 (0.019)	-0.032 (0.018)	-0.033 (0.023)	0.037 (0.021)	-0.005 (0.019)	-0.015 (0.021)	0.033 (0.017)	-0.061*** (0.015)	-0.037 (0.031)
Other race	-0.0004 (0.018)	-0.009 (0.015)	-0.019 (0.013)	0.004 (0.008)	0.012 (0.017)	-0.004 (0.018)	-0.007 (0.018)	0.003 (0.017)	-0.029 (0.019)	-0.004 (0.021)	0.016 (0.014)	0.006 (0.010)	0.008 (0.015)	0.009 (0.022)	-0.011 (0.017)
<b>Student demographics</b>															
Female	0.001 (0.011)	0.071*** (0.012)	0.0003 (0.011)	0.054*** (0.014)	0.076*** (0.015)	0.032 (0.016)	0.056* (0.020)	0.128*** (0.015)	0.010 (0.019)	0.071*** (0.012)	0.112*** (0.010)	0.016 (0.015)	0.062*** (0.013)	0.103*** (0.026)	0.057** (0.017)
Eligible for free or reduced priced meals	-0.003 (0.011)	-0.047** (0.014)	-0.027* (0.013)	0.040** (0.015)	-0.043* (0.019)	-0.032* (0.019)	0.030 (0.016)	-0.032 (0.022)	-0.035** (0.011)	0.034* (0.012)	-0.028 (0.015)	-0.033 (0.017)	0.039* (0.024)	-0.046*** (0.021)	-0.013 (0.022)
English language learner	0.046** (0.013)	0.050*** (0.014)	0.036 (0.020)	0.078*** (0.015)	0.032 (0.028)	0.050* (0.019)	0.042* (0.017)	0.023 (0.012)	-0.010 (0.017)	0.062*** (0.016)	0.034* (0.015)	0.015 (0.015)	0.028 (0.024)	0.040 (0.021)	-0.015 (0.014)
Special education student	0.033* (0.015)	0.019 (0.015)	-0.002 (0.017)	-0.051** (0.015)	-0.004 (0.016)	-0.031* (0.014)	-0.031** (0.009)	0.002 (0.016)	0.004 (0.016)	-0.055*** (0.009)	0.029 (0.015)	0.013 (0.012)	-0.015 (0.016)	-0.047*** (0.011)	-0.036** (0.011)
Took survey in the winter term	-0.034 (0.021)	-0.019 (0.020)	0.025 (0.018)	-0.057** (0.019)	-0.057** (0.015)	-0.029 (0.024)	-0.035 (0.018)	-0.099*** (0.022)	-0.026 (0.017)	-0.030 (0.031)	-0.028 (0.025)	0.020 (0.014)	-0.069* (0.027)	0.027 (0.024)	0.034 (0.029)
Age	0.037*** (0.010)	-0.030* (0.014)	-0.008 (0.012)	0.019 (0.019)	-0.042 (0.023)	0.030 (0.021)	0.073*** (0.017)	-0.040* (0.015)	-0.001 (0.024)	0.031* (0.012)	-0.046*** (0.009)	-0.024 (0.015)	0.048** (0.013)	-0.059*** (0.014)	-0.011 (0.016)
<b>Home language</b>															
English (reference)															
Spanish	0.049* (0.019)	0.002 (0.024)	-0.002 (0.018)	0.006 (0.023)	0.016 (0.021)	-0.020 (0.024)	-0.026 (0.020)	-0.010 (0.028)	-0.042 (0.030)	-0.027 (0.017)	0.010 (0.019)	0.003 (0.019)	0.027 (0.025)	0.033 (0.019)	-0.029 (0.031)
Other	0.008 (0.013)	-0.005 (0.016)	0.002 (0.015)	-0.031** (0.010)	-0.021 (0.016)	0.002 (0.011)	-0.039 (0.020)	0.007 (0.014)	-0.033 (0.020)	-0.047* (0.021)	0.004 (0.012)	-0.017 (0.016)	-0.051* (0.020)	0.006 (0.017)	-0.015 (0.013)
<i>n</i>	5,903	5,903	5,903	4,177	4,177	4,177	3,606	3,606	3,606	5,091	5,091	5,091	3,041	3,041	3,041
<i>R</i> <sup>2</sup>	0.101	0.095	0.043	0.117	0.158	0.075	0.099	0.163	0.072	0.080	0.166	0.067	0.082	0.136	0.071

Notes. Estimates calculated by running separate OLS regressions for each subgroup. Robust standard errors clustered by school. C = Conscientiousness, HWN =

= Hard work norm, PN = Preparedness norm.

\* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S13. Subgroup analyses by eligibility for free or reduced priced meals status in Study 2**

	Eligible for free or reduced priced meals			Not eligible for free or reduced priced meals		
	C	HWN	PN	C	HWN	PN
Own GPA	0.270*** (0.013)	0.058*** (0.009)	0.024* (0.011)	0.299*** (0.015)	0.082*** (0.010)	0.067*** (0.012)
Near-peer GPA	-0.068*** (0.019)	0.214*** (0.025)	0.123*** (0.018)	-0.036* (0.016)	0.235*** (0.028)	0.151*** (0.017)
Far-peer GPA	0.007 (0.016)	-0.028 (0.021)	-0.037* (0.017)	0.028 (0.019)	-0.022 (0.026)	0.001 (0.021)
<b>Race/ethnicity</b>						
White, non-Hispanic (reference)						
Black, non-Hispanic	0.051** (0.018)	-0.042* (0.016)	-0.045*** (0.012)	0.020 (0.010)	-0.015 (0.012)	-0.046*** (0.013)
Hispanic	0.030 (0.018)	-0.029 (0.016)	-0.019 (0.014)	0.010 (0.013)	-0.006 (0.013)	-0.038** (0.011)
Other race	0.008 (0.012)	0.015 (0.010)	-0.007 (0.009)	-0.006 (0.008)	0.001 (0.011)	-0.012 (0.011)
<b>Grade level</b>						
Grade 8 (reference)						
Grade 9	0.133 (0.118)	-0.029 (0.055)	0.054 (0.055)	-0.141** (0.044)	-0.032 (0.050)	0.075 (0.107)
Grade 10	0.119 (0.115)	0.025 (0.056)	0.029 (0.054)	-0.141** (0.041)	0.022 (0.048)	0.064 (0.095)
Grade 11	0.152 (0.126)	0.082 (0.063)	0.049 (0.062)	-0.160** (0.051)	0.073 (0.056)	0.081 (0.115)
Grade 12	0.124 (0.106)	0.075 (0.054)	0.043 (0.053)	-0.144** (0.047)	0.080 (0.051)	0.059 (0.094)
<b>Student demographics</b>						
Female	0.024** (0.008)	0.093*** (0.010)	0.025* (0.011)	0.064*** (0.010)	0.100*** (0.009)	0.012 (0.010)
English language learner	0.064*** (0.011)	0.026** (0.009)	0.030** (0.010)	0.035*** (0.010)	0.049** (0.015)	0.005 (0.014)
Special education student	-0.014 (0.009)	-0.016 (0.010)	-0.010 (0.012)	-0.039*** (0.010)	0.030** (0.009)	-0.005 (0.008)
Took survey in the winter term	-0.060*** (0.012)	-0.033* (0.015)	0.012 (0.012)	-0.026* (0.012)	0.001 (0.015)	0.008 (0.012)
Age	0.102*** (0.021)	-0.120*** (0.023)	-0.008 (0.031)	0.102*** (0.026)	-0.108*** (0.025)	-0.025 (0.025)
<b>Home language</b>						
English (reference)						
Spanish	-0.001 (0.014)	0.020 (0.014)	-0.015 (0.012)	0.018 (0.013)	-0.004 (0.012)	-0.017 (0.013)
Other	-0.055*** (0.013)	-0.014 (0.010)	-0.004 (0.011)	0.004 (0.010)	0.010 (0.009)	0.009 (0.010)
<i>n</i>	10,704	10,704	10,704	11,114	11,114	11,114
<i>R</i> <sup>2</sup>	0.100	0.129	0.037	0.101	0.156	0.065

Notes. Estimates calculated by running separate OLS regressions for each subgroup. Robust standard errors clustered by school. C = Conscientiousness, HWN = Hard work norm, PN = Preparedness norm.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Table S14. Subgroup analyses by race/ethnicity in Study 2

	White				Black				Hispanic				Other Race			
	C	HWN	PN	C	HWN	PN	C	HWN	PN	C	HWN	PN	C	HWN	PN	
Own GPA	0.333*** (0.014)	0.076*** (0.011)	0.080*** (0.014)	0.209*** (0.019)	0.059*** (0.017)	-0.003 (0.018)	0.299*** (0.011)	0.074*** (0.012)	0.049*** (0.011)	0.246*** (0.034)	0.033 (0.034)	0.057 (0.038)				
Near-peer GPA	-0.001 (0.021)	0.265*** (0.028)	0.191*** (0.023)	-0.071** (0.022)	0.214*** (0.029)	0.145*** (0.017)	-0.064** (0.020)	0.203*** (0.028)	0.101*** (0.021)	-0.086 (0.051)	0.174*** (0.045)	0.141*** (0.038)				
Far-peer GPA	0.071* (0.030)	0.029 (0.026)	0.060* (0.028)	-0.030 (0.023)	-0.014 (0.025)	-0.028 (0.018)	0.012 (0.019)	-0.058* (0.026)	-0.055** (0.017)	-0.037 (0.048)	-0.052 (0.048)	-0.025 (0.051)				
<b>Grade level</b>																
Grade 8 (reference)																
Grade 9	-0.019 (0.035)	0.313*** (0.059)	0.190 (0.243)	-0.036 (0.122)	0.022 (0.049)	-0.032 (0.098)	-0.102 (0.056)	-0.176*** (0.037)	-0.016 (0.045)	0.263 (0.223)	0.044 (0.248)	0.298 (0.216)				
Grade 10	-0.038 (0.024)	0.324*** (0.050)	0.159 (0.195)	-0.046 (0.147)	0.079 (0.058)	-0.053 (0.119)	-0.101 (0.052)	-0.123*** (0.034)	-0.031 (0.044)	0.227 (0.208)	0.123 (0.230)	0.229 (0.199)				
Grade 11	-0.066* (0.029)	0.425*** (0.071)	0.178 (0.245)	-0.004 (0.155)	0.177** (0.064)	-0.055 (0.132)	-0.096 (0.061)	-0.098* (0.042)	0.001 (0.050)	0.259 (0.225)	0.186 (0.266)	0.285 (0.229)				
Grade 12	-0.083** (0.031)	0.341*** (0.061)	0.145 (0.190)	-0.019 (0.137)	0.185** (0.059)	-0.022 (0.120)	-0.072 (0.051)	-0.078* (0.037)	-0.022 (0.044)	0.227 (0.204)	0.188 (0.232)	0.215 (0.199)				
<b>Student demographics</b>																
Female	0.073*** (0.012)	0.108*** (0.011)	0.014 (0.014)	0.048*** (0.013)	0.084*** (0.013)	0.009 (0.011)	0.025* (0.010)	0.095*** (0.009)	0.017 (0.009)	0.032 (0.021)	0.112*** (0.024)	0.074** (0.024)				
Eligible for free or reduced priced meals	0.011 (0.013)	-0.037** (0.011)	-0.040** (0.012)	0.021* (0.010)	-0.034 (0.022)	-0.029* (0.014)	0.031*** (0.009)	-0.046*** (0.012)	-0.016 (0.009)	-0.004 (0.017)	-0.023 (0.021)	-0.051 (0.028)				
English language learner	0.035** (0.011)	-0.003 (0.021)	0.008 (0.017)	0.025 (0.018)	0.012 (0.013)	-0.011 (0.016)	0.072*** (0.013)	0.055*** (0.012)	0.029* (0.013)	0.030 (0.025)	-0.019 (0.025)	-0.017 (0.027)				
Special education student	-0.056*** (0.013)	0.015 (0.014)	-0.001 (0.013)	-0.038* (0.016)	0.002 (0.020)	0.018 (0.015)	0.0001 (0.010)	0.003 (0.012)	-0.025* (0.010)	-0.011 (0.027)	0.021 (0.024)	-0.026 (0.020)				
Took survey in the winter term	0.010 (0.018)	0.039* (0.019)	0.031 (0.021)	-0.057** (0.016)	-0.034 (0.017)	-0.001 (0.015)	-0.066*** (0.013)	-0.041* (0.018)	0.001 (0.016)	-0.043 (0.044)	-0.025 (0.032)	0.040 (0.039)				
Age	0.142*** (0.027)	-0.077 (0.044)	-0.032 (0.030)	0.069* (0.026)	-0.187*** (0.033)	-0.012 (0.051)	0.107*** (0.022)	-0.078* (0.031)	-0.016 (0.030)	0.073 (0.047)	-0.178** (0.059)	0.010 (0.060)				
<b>Home language</b>																
English (reference)																
Spanish	0.018 (0.010)	0.013 (0.012)	0.002 (0.014)	-0.009 (0.010)	0.015 (0.015)	-0.003 (0.014)	0.008 (0.013)	0.003 (0.013)	-0.019 (0.011)	0.002 (0.007)	0.019 (0.026)	0.010 (0.018)				
Other	0.026 (0.014)	0.016 (0.012)	0.007 (0.012)	-0.075*** (0.016)	-0.005 (0.012)	-0.002 (0.018)	-0.005 (0.008)	0.003 (0.010)	0.018 (0.010)	-0.030 (0.027)	-0.0003 (0.024)	-0.010 (0.019)				
<i>n</i>	6,166	6,166	6,166	5,020	5,020	5,020	8,913	8,913	8,913	1,719	1,719	1,719				
<i>R</i> <sup>2</sup>	0.129	0.175	0.069	0.082	0.134	0.043	0.111	0.133	0.040	0.089	0.186	0.121				

Notes. Estimates calculated by running separate OLS regressions for each subgroup. Robust standard errors clustered by school. C = Conscientiousness, HWN = Hard work norm, PN = Preparedness norm.

\* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S15. Subgroup analyses by English language learner status in Study 2**

	English Language Learner			Non English Language Learner		
	C	HWN	PN	C	HWN	PN
Own GPA	0.256*** (0.028)	0.127*** (0.023)	0.040 (0.021)	0.296*** (0.014)	0.064*** (0.008)	0.045*** (0.010)
Near-peer GPA	-0.047 (0.035)	-0.034 (0.033)	-0.047 (0.035)	-0.058*** (0.017)	0.240*** (0.023)	0.150*** (0.013)
Far-peer GPA	0.046 (0.065)	-0.009 (0.079)	-0.120** (0.038)	0.013 (0.016)	-0.035 (0.018)	-0.024 (0.013)
<b>Race/ethnicity</b>						
White, non-Hispanic (reference)						
Black, non-Hispanic	-0.042 (0.044)	-0.041 (0.054)	-0.111* (0.043)	0.037*** (0.010)	-0.028** (0.009)	-0.047*** (0.007)
Hispanic	-0.093** (0.034)	0.018 (0.051)	0.020 (0.047)	0.022* (0.011)	-0.019 (0.010)	-0.036*** (0.009)
Other race	-0.032 (0.022)	0.0001 (0.028)	-0.013 (0.027)	0.0002 (0.009)	0.007 (0.008)	-0.010 (0.008)
<b>Grade level</b>						
Grade 8 (reference)						
Grade 9	0.002 (0.045)	-0.096 (0.049)	-0.013 (0.035)	-0.009 (0.094)	-0.037 (0.022)	0.061 (0.078)
Grade 10	-0.067** (0.024)	-0.067* (0.033)	-0.061 (0.032)	-0.017 (0.089)	0.021 (0.021)	0.046 (0.072)
Grade 11	(0.000)	(0.000)	(0.000)	-0.011 (0.103)	0.077** (0.026)	0.057 (0.082)
Grade 12	-0.031 (0.027)	0.040 (0.029)	-0.022 (0.025)	-0.015 (0.087)	0.076** (0.025)	0.045 (0.068)
<b>Student demographics</b>						
Female	-0.033 (0.020)	0.061** (0.021)	-0.047* (0.020)	0.052*** (0.007)	0.099*** (0.007)	0.026*** (0.007)
Eligible for free or reduced priced meals	0.034 (0.017)	-0.072** (0.023)	0.037 (0.020)	0.021* (0.008)	-0.036*** (0.010)	-0.036*** (0.007)
Special education student	0.015 (0.015)	0.004 (0.023)	-0.049 (0.027)	-0.028*** (0.007)	0.009 (0.008)	-0.003 (0.007)
Took survey in the winter term	-0.119*** (0.022)	-0.101*** (0.024)	0.001 (0.024)	-0.036** (0.011)	-0.009 (0.013)	0.006 (0.010)
Age	0.150** (0.048)	-0.063 (0.045)	-0.060 (0.038)	0.099*** (0.018)	-0.124*** (0.018)	-0.004 (0.022)
<b>Home language</b>						
English (reference)						
Spanish	-0.023 (0.079)	-0.048 (0.084)	-0.129 (0.079)	0.003 (0.011)	0.007 (0.009)	-0.010 (0.009)
Other	-0.128 (0.091)	-0.079 (0.076)	-0.045 (0.074)	-0.021 (0.011)	0.002 (0.006)	0.002 (0.008)
<i>n</i>	2,091	2,091	2,091	19,727	19,727	19,727
<i>F</i> <sup>2</sup>	0.124	0.086	0.059	0.097	0.171	0.064

Notes. Estimates calculated by running separate OLS regressions for each subgroup. Robust standard errors clustered by school. C = Conscientiousness, HWN = Hard work norm, PN = Preparedness norm.

\*p < .05; \*\*p < .01; \*\*\* < .001

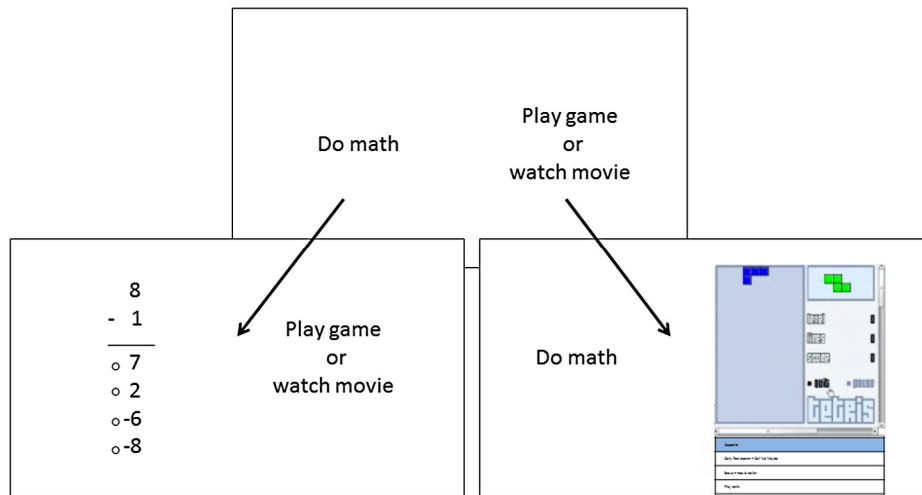
Table S16. Subgroup analyses by GPA tertiles in Study 2

	Low GPA			Medium GPA			High GPA		
	C	HWN	PN	C	HWN	PN	C	HWN	PN
<b>Own GPA</b>	0.353*** (0.060)	0.076 (0.054)	0.147*** (0.040)	0.553*** (0.046)	0.132** (0.047)	0.115*** (0.029)	0.159*** (0.021)	0.061*** (0.015)	0.036 (0.022)
<b>Near-peer GPA</b>	-0.072*** (0.020)	0.273*** (0.027)	0.145*** (0.021)	-0.069** (0.021)	0.174*** (0.047)	0.120*** (0.022)	-0.033 (0.023)	0.243*** (0.027)	0.149*** (0.022)
<b>Far-peer GPA</b>	0.023 (0.022)	0.012 (0.022)	-0.029 (0.022)	0.002 (0.028)	-0.030 (0.031)	0.009 (0.021)	0.040 (0.028)	-0.071* (0.030)	-0.031 (0.019)
<b>Race/ethnicity</b>									
White, non-Hispanic (reference)									
Black, non-Hispanic	0.032 (0.017)	-0.005 (0.015)	-0.062*** (0.016)	0.003 (0.019)	-0.029 (0.016)	-0.061*** (0.016)	0.083*** (0.013)	-0.047** (0.015)	-0.034* (0.016)
Hispanic	0.033 (0.021)	0.003 (0.015)	-0.058*** (0.015)	0.0001 (0.019)	-0.007 (0.016)	-0.003 (0.017)	0.048** (0.017)	-0.033 (0.021)	-0.028 (0.014)
Other race	0.014 (0.017)	0.008 (0.015)	-0.022* (0.010)	-0.030** (0.009)	0.002 (0.010)	-0.002 (0.011)	0.027 (0.016)	0.017 (0.020)	-0.018 (0.018)
<b>Grade level</b>									
Grade 8 (reference)									
Grade 9	-0.026 (0.053)	-0.179* (0.078)	-0.196*** (0.045)	-0.177** (0.053)	0.024 (0.058)	0.141 (0.091)	0.249* (0.101)	-0.070 (0.092)	0.316** (0.118)
Grade 10	-0.052 (0.048)	-0.123 (0.073)	-0.184*** (0.042)	-0.162** (0.050)	0.094 (0.054)	0.105 (0.084)	0.227* (0.096)	-0.028 (0.088)	0.287* (0.112)
Grade 11	-0.057 (0.058)	-0.103 (0.085)	-0.184*** (0.050)	-0.148* (0.056)	0.148* (0.065)	0.107 (0.096)	0.271* (0.109)	0.039 (0.100)	0.347* (0.131)
Grade 12	-0.069 (0.050)	-0.082 (0.072)	-0.135** (0.042)	-0.120* (0.047)	0.135* (0.056)	0.073 (0.083)	0.224* (0.092)	0.049 (0.084)	0.280* (0.109)
<b>Student demographics</b>									
Female	0.045*** (0.012)	0.085*** (0.010)	0.022* (0.011)	0.059*** (0.011)	0.112*** (0.012)	0.022 (0.011)	0.023 (0.012)	0.086*** (0.011)	0.011 (0.012)
Eligible for free or reduced priced meals	0.039*** (0.011)	-0.031 (0.016)	-0.025 (0.015)	0.019 (0.015)	-0.060*** (0.011)	-0.036** (0.011)	0.021 (0.012)	-0.038** (0.013)	-0.027* (0.013)
English language learner	0.061*** (0.014)	0.058*** (0.012)	0.033* (0.013)	0.026 (0.017)	-0.005 (0.017)	-0.014 (0.019)	0.057*** (0.011)	0.036* (0.014)	0.019 (0.013)
Special education student	-0.041** (0.014)	0.002 (0.013)	-0.024* (0.011)	-0.026** (0.009)	0.029** (0.010)	0.011 (0.010)	-0.036*** (0.010)	-0.011 (0.012)	-0.014 (0.013)
Took survey in the winter term	-0.043* (0.018)	-0.009 (0.013)	-0.004 (0.016)	-0.043* (0.020)	0.001 (0.020)	-0.006 (0.013)	-0.051*** (0.014)	-0.041* (0.018)	0.031* (0.015)
Age	0.155*** (0.032)	-0.093** (0.030)	-0.062** (0.023)	0.005 (0.026)	-0.104** (0.034)	0.017 (0.039)	0.120*** (0.034)	-0.132*** (0.026)	-0.002 (0.037)
<b>Home language</b>									
English (reference)									
Spanish	0.008 (0.018)	0.010 (0.013)	0.004 (0.015)	-0.001 (0.020)	-0.003 (0.015)	-0.050** (0.015)	0.012 (0.016)	0.014 (0.016)	-0.007 (0.016)
Other	-0.029* (0.013)	-0.012 (0.011)	-0.008 (0.014)	-0.025* (0.010)	0.004 (0.012)	-0.010 (0.009)	-0.033* (0.014)	0.0001 (0.011)	0.016 (0.013)
<i>n</i>	7,243	7,243	7,243	7,061	7,061	7,061	7,514	7,514	7,514
<i>R</i> <sup>2</sup>	0.061	0.138	0.062	0.053	0.155	0.069	0.071	0.128	0.038

Notes. Estimates calculated by running separate OLS regressions for each subgroup. Robust standard errors clustered by school. C = Conscientiousness, HWN = Hard work norm, PN = Preparedness norm.

\* p < .05, \*\* p < .01, \*\*\* p < .001.

### 3. Study 3



**Fig. S3.** In the Academic Diligence Task (1), students choose between “Do math” or “Play game or watch movie.” If they click “Do math,” they solve single-digit subtraction problems. If they instead click “Play game or watch movie,” a pull-down menu is displayed that contains various video clips or the option to play the video game Tetris. At any point the students can toggle between math or entertainment, but the program restricts engagement to one activity at a time. Figure reproduced with permission from Galla et al. (1).

**Table S17. Means, standard deviations, and correlation coefficients in Study 3.**

	1	2	3	4	5	6	7
1. Grit		0.59***	0.09**	0.08**	0.09**	0.27***	-0.01
2. Self-control	0.61***		0.17***	0.12***	0.03	0.32***	-0.06*
3. ADT	0.06	0.12***		0.14***	0.27***	0.25***	0.20***
4. College graduation	0.03	0.05	0.18***		0.19***	0.38***	0.04
5. SAT score	-0.06	-0.12***	0.28***	0.27***		0.47***	0.44***
6. GPA	0.27***	0.31***	0.27***	0.33***	0.31***		0.18***
7. Cognitive ability	-0.10***	-0.16***	0.24***	0.11***	0.53***	0.16***	
<i>M</i>	3.69	3.50	10.47	33.49%	921.11	2.91	63.10%
<i>SD</i>	0.74	0.70	4.95		184.24	0.67	
<i>N</i>	1,166	1,166	803	1,278	970	944	1,123

Notes. Correlations controlling for school dummy variables shown above the diagonal.

†  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

**Table S18. Multilevel logistic regression models predicting college graduation using the full sample in Study 3**

	Grit		Self-control		Academic Diligence Task	
	(1)	(2)	(1)	(2)	(1)	(2)
Grit: level 1 (student)	0.186** (0.066)	0.184* (0.077)				
Grit: level 2 (school)	-0.398** (0.125)	-0.386** (0.130)				
Missing grit	0.155 (0.227)	0.248 (0.342)				
Self-control: level 1 (student)			0.278*** (0.068)	0.252** (0.080)		
Self-control: level 2 (school)			-0.459*** (0.121)	-0.474*** (0.126)		
Missing self-control			0.163 (0.227)	0.264 (0.340)		
Academic Diligence Task: level 1 (student)					0.246** (0.090)	0.213* (0.106)
Academic Diligence Task: level 2 (school)					0.498*** (0.138)	0.413* (0.163)
Missing Academic Diligence Task					-0.134 (0.137)	-0.053 (0.163)
General cognitive ability	0.109 (0.071)	0.083 (0.083)	0.117† (0.071)	0.080 (0.083)	0.087 (0.071)	0.066 (0.084)
Missing General cognitive ability	-0.539** (0.207)	-0.456* (0.231)	-0.541** (0.208)	-0.426† (0.231)	-0.502* (0.208)	-0.439† (0.233)
<b>Student demographics</b>						
Age		-0.299* (0.139)		-0.364** (0.140)		-0.292* (0.139)
Female		0.613*** (0.152)		0.540*** (0.153)		0.596*** (0.153)
Eligible for free or reduced-priced meals		-0.477† (0.259)		-0.505* (0.257)		-0.461† (0.261)
English Language Learner		0.388 (0.330)		0.492 (0.322)		0.180 (0.345)
Special Education Student		0.362 (0.371)		0.359 (0.371)		0.483 (0.372)
<b>Race/ethnicity</b>						
White		0.145 (0.475)		0.087 (0.479)		0.203 (0.481)
Hispanic		-0.023 (0.222)		-0.142 (0.228)		0.080 (0.222)
Asian		0.187 (0.344)		0.136 (0.341)		0.212 (0.346)
Other		-0.401 (0.370)		-0.398 (0.372)		-0.358 (0.370)
Constant	-0.731*** (0.125)	4.768† (2.491)	-0.730*** (0.117)	6.036* (2.512)	-0.637*** (0.132)	4.645† (2.492)
Observations	1,278	937	1,278	937	1,278	937
Log Likelihood	-775.303	-566.788	-769.586	-563.423	-775.282	-569.294
Akaike Inf. Crit.	1,564.605	1,165.576	1,553.171	1,158.846	1,564.563	1,170.589
Bayesian Inf. Crit.	1,600.677	1,243.059	1,589.242	1,236.329	1,600.634	1,248.072
AUC	0.671	0.696	0.678	0.692	0.674	0.695

Notes. For each variable we report 2 models. (1) Unadjusted, (2) Controlling for student characteristics. Level 2 is the empirical bayesian estimate of the school mean. Level 1 is the deviation of each individual relative to the estimated school mean. Numeric variables were standardized prior to estimation, so coefficients are betas. Categorical variables are not standardized.

† < p .10, \* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S19. Models Predicting College Graduation from Self-Reported Grit and Self-Control, and the Academic Diligence Task (untransformed)**

	Grit		Self-control		Academic Diligence Task	
	(1)	(2)	(1)	(2)	(1)	(2)
Grit: level 1 (student)	0.186** (0.066)	0.184* (0.077)				
Grit: level 2 (school)	-0.398** (0.125)	-0.386** (0.130)				
Missing grit	0.155 (0.227)	0.248 (0.342)				
Self-control: level 1 (student)			0.278*** (0.068)	0.252** (0.080)		
Self-control: level 2 (school)			-0.459*** (0.121)	-0.474*** (0.126)		
Missing self-control			0.163 (0.227)	0.264 (0.340)		
Academic Diligence Task: level 1 (student)					-0.103 (0.127)	-0.157 (0.148)
Academic Diligence Task: level 2 (school)					0.318* (0.154)	0.182 (0.176)
Missing Academic Diligence Task					-0.112 (0.136)	-0.011 (0.162)
General cognitive ability	0.109 (0.071)	0.083 (0.083)	0.117† (0.071)	0.080 (0.083)	0.113 (0.070)	0.088 (0.083)
Missing General cognitive ability	-0.539** (0.207)	-0.456* (0.231)	-0.541** (0.208)	-0.426† (0.231)	-0.511* (0.208)	-0.447† (0.232)
<b>Student demographics</b>						
Age		-0.299* (0.139)		-0.364** (0.140)		-0.295* (0.138)
Female		0.613*** (0.152)		0.540*** (0.153)		0.633*** (0.152)
Eligible for free or reduced-priced meals		-0.477† (0.259)		-0.505* (0.257)		-0.392 (0.262)
English Language Learner		0.388 (0.330)		0.492 (0.322)		0.228 (0.342)
Special Education Student		0.362 (0.371)		0.359 (0.371)		0.459 (0.371)
<b>Race/ethnicity</b>						
White		0.145 (0.475)		0.087 (0.479)		0.197 (0.480)
Hispanic		-0.023 (0.222)		-0.142 (0.228)		0.151 (0.220)
Asian		0.187 (0.344)		0.136 (0.341)		0.240 (0.345)
Other		-0.401 (0.370)		-0.398 (0.372)		-0.332 (0.368)
Constant	-0.731*** (0.125)	4.768† (2.491)	-0.730*** (0.117)	6.036* (2.512)	-0.638*** (0.129)	4.568† (2.480)
Observations	1,278	937	1,278	937	1,278	937
Log Likelihood	-775.303	-566.788	-769.586	-563.423	-778.971	-571.037
Akaike Inf. Crit.	1,564.605	1,165.576	1,553.171	1,158.846	1,571.943	1,174.075
Bayesian Inf. Crit.	1,600.677	1,243.059	1,589.242	1,236.329	1,608.014	1,251.557
AUC	0.671	0.696	0.678	0.692	0.674	0.695

Notes. For each variable we report 2 models. (1) Unadjusted, (2) Controlling for student characteristics. Level 2 is the empirical bayesian estimate of the school mean. Level 1 is the deviation of each individual relative to the estimated school mean. Numeric variables were standardized prior to estimation, so coefficients are betas. Categorical variables are not standardized.

† < p .10, \* p < .05, \*\* p < .01, \*\*\* p < .001.

**Table S20. Multilevel logistic regression models predicting college graduation using listwise deletion in Study 3**

	Grit		Self-control		Academic Diligence Task	
	(1)	(2)	(1)	(2)	(1)	(2)
Grit: level 1 (student)	0.163*	0.151 <sup>†</sup>				
	(0.070)	(0.083)				
Grit: level 2 (school)	-0.385**	-0.343*				
	(0.135)	(0.136)				
Self-control: level 1 (student)			0.285***	0.226**		
			(0.072)	(0.085)		
Self-control: level 2 (school)			-0.460***	-0.448***		
			(0.130)	(0.118)		
Academic Diligence Task: level 1 (student)					0.334**	0.280*
					(0.106)	(0.128)
Academic Diligence Task: level 2 (school)					0.682***	0.553**
					(0.164)	(0.195)
General cognitive ability	0.080	0.064	0.091	0.064	0.008	0.025
	(0.074)	(0.085)	(0.074)	(0.085)	(0.089)	(0.105)
<b>Student demographics</b>						
Age		-0.320*		-0.366*		-0.268
		(0.151)		(0.149)		(0.183)
Female		0.559***		0.477**		0.527**
		(0.165)		(0.167)		(0.200)
Eligible for free or reduced-priced meals		-0.703*		-0.788**		-0.661 <sup>†</sup>
		(0.300)		(0.305)		(0.343)
English Language Learner		0.417		0.533 <sup>†</sup>		0.306
		(0.370)		(0.322)		(0.472)
Special Education Student		0.079		0.074		0.459
		(0.446)		(0.446)		(0.661)
<b>Race/ethnicity</b>						
White		-0.060		-0.108		-0.097
		(0.514)		(0.513)		(0.553)
Hispanic		0.015		-0.115		0.115
		(0.249)		(0.244)		(0.276)
Asian		0.196		0.172		0.216
		(0.375)		(0.370)		(0.430)
Other		-0.539		-0.519		-0.241
		(0.405)		(0.408)		(0.475)
Constant	-0.750***	5.391*	-0.751***	6.377*	-0.655***	4.385
	(0.133)	(2.711)	(0.124)	(2.680)	(0.137)	(3.280)
Observations	1,037	780	1,037	780	740	552
Log Likelihood	-639.542	-478.316	-633.036	-474.456	-457.054	-339.973
Akaike Inf. Crit.	1,289.083	984.633	1,276.072	976.913	924.108	707.947
Bayesian Inf. Crit.	1,313.804	1,049.863	1,300.793	1,042.143	947.141	768.337
AUC	0.671	0.696	0.678	0.692	0.674	0.695

Notes. For each variable we report 2 models. (1) Unadjusted, (2) Controlling for student characteristics. Level 2 is the empirical bayesian estimate of the school mean. Level 1 is the deviation of each individual relative to the estimated school mean. Numeric variables were standardized prior to estimation, so coefficients are betas. Categorical variables are not standardized.

<sup>†</sup> < p .10, \* p < .05, \*\* p < .01, \*\*\* p < .001.

Table S21. OLS regression models predicting self-reported grit and self-control, and the Academic Diligence Task from peer and own performance in Study 3 (conceptual replication of Studies 1 and 2).

	ADT			Grit			Self-Control			
	CG	CA	GPA	CG	CA	GPA	CG	CA	GPA	SAT
Own performance	0.117 (0.058)	0.204** (0.046)	0.182** (0.072)	0.286*** (0.073)	-0.018 (0.037)	0.315*** (0.064)	0.079 (0.075)	0.095*** (0.018)	-0.060 (0.013)	0.328*** (0.048)
Peer performance	0.016 (0.053)	0.078** (0.024)	0.023 (0.072)	-0.110 (0.08)	-0.212*** (0.041)	-0.214*** (0.038)	-0.260*** (0.054)	-0.239*** (0.028)	-0.243*** (0.047)	-0.066*** (0.021)
<b>Student demographics</b>										
Eligible for free or reduced-price meals	-0.026 (0.152)	0.064 (0.237)	-0.055 (0.116)	0.010 (0.157)	0.050 (0.065)	0.099 (0.141)	0.109 (0.151)	0.053 (0.184)	0.033 (0.09)	0.305 (0.155)
Female	0.096 (0.117)	0.138 (0.116)	0.032 (0.16)	0.145 (0.083)	-0.048 (0.047)	-0.013 (0.065)	-0.114 (0.055)	0.200*** (0.034)	0.268*** (0.045)	0.097 (0.043)
English language learner	0.338 (0.189)	0.379* (0.159)	0.373 (0.32)	0.062 (0.663)	-0.041 (0.321)	-0.229 (0.242)	-0.297 (0.309)	0.264** (0.092)	0.074 (0.081)	0.051 (0.134)
Special education student	-0.491* (0.222)	-0.490* (0.21)	-0.220 (0.227)	-0.079 (0.305)	0.221 (0.118)	0.325*** (0.091)	0.431 (0.237)	0.226 (0.106)	0.172 (0.165)	0.486*** (0.148)
<b>Race/ethnicity</b>										
White	0.198 (0.133)	0.177 (0.183)	0.153 (0.091)	0.129 (0.191)	0.087 (0.225)	0.079 (0.334)	-0.046 (0.077)	-0.038 (0.312)	-0.022 (0.431)	-0.139 (0.787)
Hispanic	0.229* (0.097)	0.011 (0.099)	0.246 (0.14)	0.203* (0.085)	-0.071 (0.164)	0.047 (0.097)	-0.083 (0.14)	-0.190 (0.121)	-0.071 (0.069)	-0.191*** (0.039)
Asian	0.645*** (0.117)	0.532*** (0.089)	0.604*** (0.09)	0.519*** (0.118)	0.194 (0.446)	0.227 (0.22)	-0.121 (0.365)	0.077 (0.123)	0.149 (0.182)	-0.214 (0.158)
Other	0.054 (0.224)	0.009 (0.2)	0.145 (0.287)	0.031 (0.22)	0.161 (0.192)	0.133 (0.195)	0.054 (0.253)	-0.099 (0.166)	-0.174 (0.216)	-0.188 (0.222)
Intercept	-0.218 (0.332)	-0.211 (0.393)	-0.211 (0.308)	-0.293 (0.23)	0.000 (0.084)	-0.134 (0.162)	-0.035 (0.105)	-0.112 (0.174)	-0.195 (0.099)	-0.149 (0.152)

Notes. ADT = Academic Diligence Task, CG = College graduation, CA = Cognitive ability. Standard errors were calculated from the 95% bootstrap confidence intervals. They are calculated under the assumption of symmetric confidence intervals that are t-distributed. These assumptions do not necessarily hold in the wild bootstrap procedure.

† p < .10, \* p < .05, \*\* p < .01, \*\*\* p < .001.

**SI Dataset S1 (S2-CleanData.dta)**

[Click here for dataset for Study 2.](#)

**SI Dataset S2 (S3-CleanData.rda)**

[Click here for dataset for Study 3.](#)

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