The Effect of SAT Scores on College Success

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Overview

- This paper studies the effect of SAT Scores on college success, measured using graduation rate.
- Reasons this matters:
  - Many colleges must decide to remain test optional post-Covid or return to requiring test scores.
  - High schools devote a lot of resources and money towards SAT prep, as do individual families.
  - However, research suggests that SAT tests may negatively affect women, people of color, and students of low-income families.
- To test the effect of SAT scores on college success, we use data on SAT scores and college graduation for 2,535 US college students.
- Our results suggest: SAT scores are statistically significant predictors of college graduation; however, so are high school grades.

Model

$$GRAD_i = B_0 + B_1 SATV_i + B_2 SATM_i + B_3 G_i + B_4 Female_i + B_5 E_i + B_6 SATF_i + B_7 SATE_i + B_8 HSEMP_i + B_9 Public_i + B_{10} Q_i + B_{11} ABOVEPOV + u_i$$

- GRAD is a dummy variable that equals 1 if a student completed college within four years and is our measure of college success.
- SATV (SAT verbal) and SATM (SAT math) are measured on an 800-point scale.
- G could better explain the variation in college success. It is composed of a series of variables that contain high school senior year letter grades for the following courses: English, History, Math, and Science as a proxy for high school GPA.
- Female and E are dummy variables used to control for and analyze the effects of gender and race/ethnicity on college success.
- SATF and SATE are a series of interactive terms between SAT scores and gender and ethnicity.
- The remainder of variables are control variables.
- Variable specifics can be found in the model and data section of our paper.

Table 2 – Regression of Variables on Graduation

Dependent Variable: Graduation = [1 or 0]	(1)	(2)	(3)	(4)
SATV	0.07785*** (0.0119)	0.05103*** (0.01272)	0.04139*** (0.01307)	0.05324* (0.02822)
SATM	0.0602*** (0.01152)	0.05124*** (0.01273)	0.0577*** (0.01413)	0.04221 (0.02927)
English Grade		0.0860369*** (0.0217901)	0.0761623*** (0.0224739)	0.0732396*** (0.0225364)
History Grade		0.0387638* (0.0211522)	0.0418653* (0.0214253)	0.0421264** (0.0214665)
Math Grade		0.0181952 (0.0181451)	0.0162738 (0.0184753)	0.015864 (0.0185396)
Science Grade		0.0504575*** (0.0196148)	0.0476341** (0.0198787)	0.047754** (0.0199026)
Public School		-0.0442017** (0.0200424)	-0.0395048* (0.0206267)	-0.0409767** (0.0207279)
Female			0.0616184*** (0.0186366)	0.3694048** (0.1632394)
Black			-0.0523999* (0.0272215)	-0.3015097 (0.2432868)
Asian			-0.0310608 (0.0239544)	-0.2586391 (0.2611722)
Hispanic			-0.0210623 (0.0256735)	-0.3770273 (0.2514889)
Female_SATM				-0.0004664* (0.0002476)
Black_SATM				0.0006786* (0.0003641)
Asian_SATM				0.0005845*

***Significant at 1 percent level
**Significant at the 5 percent level
*Significant at the 10 percent level
Standard errors are robust and in parentheses
SATV and SATM are on 100 point scale change
Variables excluded due to insignificance:
Excellent/Good/Fair Quality
Above Poverty Line
Employed
Hispanic_SATV/SATM
Female_SATV
Black_SATV
Asian_SATV

Results

- **Regression 2** adds controls for high school performance, type, and quality. As expected, the regression shows that higher grades in high school courses contribute to higher graduation rates. English and science, both significant at the 1% level, show that if a student increased their grade by 1 point on a typical 4.0 GPA scale, they would increase their chance of graduating by 8.6% and 5%, respectively. However, this regression shows that, even after controlling for high school grades, SAT scores are still significant at the 1% level.
- **Regression 4** contains all variables with the addition of the interactive terms. All the interactive terms have very small coefficients and only Female_SATM, Black_SATM, and Asian_SATM are statistically significant. Low significance (if at all) is likely caused by a selection bias.
- **Potential Selection Bias:**
  - This survey chose very selective institutions to draw data from. These students were far above average when it came to high school grades and SAT scores, and as a result it is possible that our control variables, such as race, were not statistically significant because our data is not representative of the entire student population across the US. This also likely affected the ABOVEPOV variable. Because selective institutions tend to come at a higher price tag for tuition and as we can see that almost 90% of the survey respondents were above the poverty line, this variable is not as representative of the entire student population across the US as we would have liked.

References: See biography for complete list of references
- Bart, Austin Cory
- Berry, Christopher M., and Paul R. Sackett
- Betts, J., & Morell, D
- Chissom, Brad S., and Doris Lanier.
- Choi, Seung H., Tae-Nyun Kim, and Jacob Camins-Esakov.
- Cohn, Elchanan, Sharon Cohn, Donald C. Balch, and James Bradley Jr.
- Geiser, Saul.
- DATA SOURCE: National Longitudinal Survey of Freshman.

Zoom Link: May 7 from 3:00-5:00 pm:
https://sewanee-edu.zoom.us/j/81848084658