

# The Validity of the SAT<sup>®</sup> for Predicting Cumulative Grade Point Average by College Major<sup>1</sup>

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## Introduction

There has been a great deal of research on the relationship between the SAT<sup>®</sup> and college grade point average (GPA), but less work has been done examining that relationship by the different college major fields (subsequently referred to as “major”). This study focused on the nature of the SAT’s and high school GPAs (HSGPA) relationships with cumulative GPA (cGPA) by college major field. The findings from this study can guide higher education institutions in understanding SAT performance differences in light of students’ intended college major. For example, there may be majors for which the SAT is more predictive of cGPA than for other majors. Or, there may be majors for which a particular SAT section may be highly predictive of college performance, while another SAT section may not be as strongly related.

## About the Research

This study evaluated whether the relationship between the SAT and cGPA, as well as the relationship between HSGPA and cGPA, differed by college major. In addition, this study examined whether these relationships differed by college major *and* student subgroup (e.g., gender, race/ethnicity, highest parental education level).

## Data and Methodology

The data used for this study were based on 66 four-year institutions that submitted second-year college performance data for students who began their college studies in the fall of 2006 for research on the SAT and college success. Thirty-nine of these institutions also submitted information on students’ majors at the beginning of their third year of college. Data from these colleges and universities were merged with College Board data, including SAT scores and student responses to the SAT Questionnaire (SAT-Q). Students complete the SAT-Q when they register to take the SAT. Ultimately, there were 39,440 students included in this study.

Analyses in this study focused on average differences in SAT, HSGPA, cGPA, and retention by major (see Table 1), as well as by major and subgroup. However, there was an even greater focus on the differences in the predictive nature of the SAT, HSGPA, or both the SAT and HSGPA together, to predict cGPA (at the end of the second year of college) across majors — as well as by major and subgroup.

## Results and Conclusions

The results showed that the relationship between the SAT and cGPA varied somewhat by major, as well as by major and subgroup. For example, analyses showed that the SAT tended to be most predictive of cGPA in the STEM majors, and added incremental value to HSGPA in the prediction of cGPA across all majors. The starkest differences in the relationship between both the SAT and HSGPA with cGPA across majors were found among undeclared students versus students enrolled with defined majors. The undeclared students displayed the weakest relationship between the two academic measures with cGPA. Further subgroup analyses by gender, race/ethnicity, and highest parental education level showed more nuanced patterns across majors. For example, the starkest difference in the SAT and cGPA relationship between female and male students was in communications/journalism, in which the relationship was notably stronger for female students. Other differential prediction analyses showed that the SAT predicted students to perform slightly better in certain majors, including the STEM fields, than they actually performed, while the SAT predicted students to perform slightly worse in other majors, including education, humanities and liberal arts, and foreign languages, than they actually performed.

This variability across majors was likely due to differences in the nature of the college course work, grading practices, student self-selection, and academic cultures (e.g., male dominated or highly competitive) across majors. The find-

ings from this study may be particularly relevant to colleges and universities in examining different admission criteria for acceptance to specialized colleges and major programs within an institution, and thus the study can serve as a

comprehensive resource for higher education researchers examining the relationship between college major and academic performance.

**Table 1.**

Descriptive Statistics of Academic Measures by Major Category

Major Category	k	n	%	SAT-CR		SAT-M		SAT-W		HSGPA		cGPA		Retention to Year 3	
				Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Agriculture/Natural Resources	24	514	1%	564	82.6	570	77.1	548	80.7	3.61	0.51	3.03	0.57	0.93	0.26
Biological and Biomedical Sciences	39	3,329	8%	582	91.4	608	90.6	575	92.0	3.80	0.45	3.17	0.58	0.91	0.28
Business, Management, and Marketing	36	6,259	16%	541	88.8	577	91.3	537	88.8	3.58	0.52	3.07	0.59	0.91	0.28
Communications/Journalism	35	2,616	7%	553	89.0	548	89.0	551	86.6	3.58	0.51	3.10	0.54	0.94	0.25
Computer and Information Science	37	901	2%	588	94.6	633	87.4	566	94.0	3.62	0.48	2.95	0.64	0.90	0.30
Education	27	2,126	5%	521	85.5	531	86.8	519	84.6	3.55	0.50	3.15	0.57	0.89	0.31
Engineering/Architecture	31	5,509	14%	593	84.4	657	76.1	579	85.1	3.80	0.43	3.08	0.59	0.95	0.22
Foreign Languages, Literatures, and Linguistics	30	603	2%	606	96.4	592	90.6	601	97.5	3.76	0.46	3.30	0.54	0.94	0.24
Health Professions and Related Clinical Sciences	30	2,417	6%	535	84.2	557	85.4	537	81.4	3.70	0.46	3.16	0.54	0.89	0.31
Humanities and Liberal Arts	39	5,236	13%	587	93.8	568	88.9	575	90.7	3.61	0.49	3.19	0.55	0.92	0.28
Mathematics and Statistics/Physical Sciences	35	1,310	3%	591	95.1	639	89.7	577	93.5	3.78	0.45	3.14	0.60	0.93	0.25
Security and Protective Services	18	623	2%	501	80.1	515	83.8	494	81.9	3.29	0.50	2.86	0.63	0.87	0.33
Social Sciences	39	5,527	14%	584	96.0	580	96.6	575	94.6	3.65	0.48	3.14	0.55	0.93	0.26
Social Services and Public Administration	20	271	1%	532	88.1	517	92.4	520	89.8	3.51	0.50	3.03	0.59	0.90	0.29
Undeclared	30	2,199	6%	540	100.6	557	103.3	533	99.3	3.46	0.54	2.72	0.65	0.70	0.46
Total	39	39,440	100%	566	94.3	585	96.9	558	92.4	3.65	0.50	3.10	0.59	0.91	0.29

1. E. J. Shaw, J. L. Koblin, B. F. Patterson, and K. D. Mattern, *The Validity of the SAT® for Predicting Cumulative Grade Point Average by College Major* (College Board Research Report No. 2012-6) (New York: The College Board, 2012). Accessed from <http://research.collegeboard.org/rr2012-6.pdf>

