

Estimating the Value of SAT Writing: Admissions and Student Success

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- Management to improve selectivity w/o affecting enrollment
 - Better predictions for retention imply smaller cohorts
 - Smaller cohorts imply fewer required acceptances of applicants
- SAT writing score (SATW) part of applicant record for 2 years
 - Should admissions office consider using SATW in decisions?
 - How good of a predictor is it? What weight should it be given?
- Associate deans requested more measures of student success

Changes to the SAT in 2005

- Verbal
 - Renamed “Critical Reasoning”
 - Removal of analogies section and replaced with reading comprehension
- Math
 - Added algebra II content
 - Removed quantitative comparisons (Column A, Column B, >, <, =)
- Writing
 - 25 minutes to read a prompt and write a response
 - 35 minutes multiple choice on grammar and structure improvement

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As has been the trend in the SAT over the preceding decades, the test has slowly been moving toward more of an achievement test as opposed to an aptitude test. The SAT has its roots in an IQ test all the way back to 1926 when psychometricians at Princeton started the Scholastic Aptitude Test and hammered students with 300 questions in 90 minutes. In the 1960s, the SAT II came about and introduced achievement tests that tried to measure knowledge on subject matter like chemistry and mathematics. The debate between aptitude and achievement had begun!

1980 through 1993 the ETS tried to respond to the criticisms that the test was unjustly harming minority students who, like on IQ tests, were uniformly scoring lower than white, middle-class students. The so-called “strivers” project to give credit to students who score significantly (then 2 sigma) higher than their expected score was leaked to the public and shut down. But the fact that the ETS was trying to account for the evidence that their test was not a common yardstick is further evidence that the test has slowly been aging toward a more fair assessment of achievement than some difficult-to-measure innate ability or aptitude. Indeed, at the same time, the test changed its name from “aptitude” to Scholastic Assessment Test, and then later simply “SAT: Reasoning Test” with the former acronym becoming meaningless.

Finally in 2005, the test became much closer to an achievement test with the addition of a writing section.

- Old SAT I scores matter
 - Modest predictive power on first-year GPA on top of HSGPA
 - Scores proxy for socioeconomic factors—relationships biased upwards
- SATW relationship with student success might mirror SAT II?
 - Tests are similar and UC had 30 years of experience
 - Less SES bias—test measures achievement more than “aptitude”
 - Second-best predictor after HSGPA
- Initial institutional findings are consonant

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UC proposed to drop SAT II because new SAT is good enough

- Archival study (N = 2144)
 - Incoming freshmen in fall 2006 and 2007
 - First-year outcomes (GPA, English 110, retention, academic probation)
- Multiple regression “value added” approach
 - Model outcome of interest according to admissions index (Model 1)
 - o Current admissions index includes HSGPA and SATM / SATV
 - o Verify weights given to each
 - Add in SATW (Model 2)

LMU|LA ~~Not interested in biases or omitted variables (pure prediction)~~

Results – First-year GPA

	Model 1		Model 2	
	Coefficient	<i>t</i>	Coefficient	<i>t</i>
HSGPA	0.85	***19.33	0.83	***18.79
SATV/100	0.08	***3.72	-0.01	-0.18
SATM/100	0.09	***4.62	0.06	**3.18
SATW/100			0.14	***5.03
N	2144		2144	
R ²	0.19		0.20	

- SATV becomes meaningless
- Standardized coefficients: SATW approx. 40% of HSGPA

Results – English 110

	Model 1		Model 2	
	Coefficient	<i>t</i>	Coefficient	<i>t</i>
HSGPA	0.73	***12.62	0.71	***11.66
SATV	0.03	1.16	-0.05	-1.44
SATM	0.04	1.56	0.01	0.45
SATW			0.15	***4.02
N	1821		1821	
R ²	0.09		0.10	

- SAT said nothing, but SATW appears to measure something
- Approximately 50 SATW points “worth” 0.1 HSGPA

Results - Retention

	Model 1		Model 2	
	APE	z	APE	z
HSGPA	0.07	**3.39	0.07	**3.41
SATV	-0.02	*-2.26	-0.02	-1.55
SATM	0.02	*2.49	0.02	**2.50
SATW			-0.01	-0.37
N	2144		2144	
-R ²	0.01		0.01	

- No big relationships to retention worth modeling
- SATW again clouds the worth of SATV

Results – First Semester Academic Probation

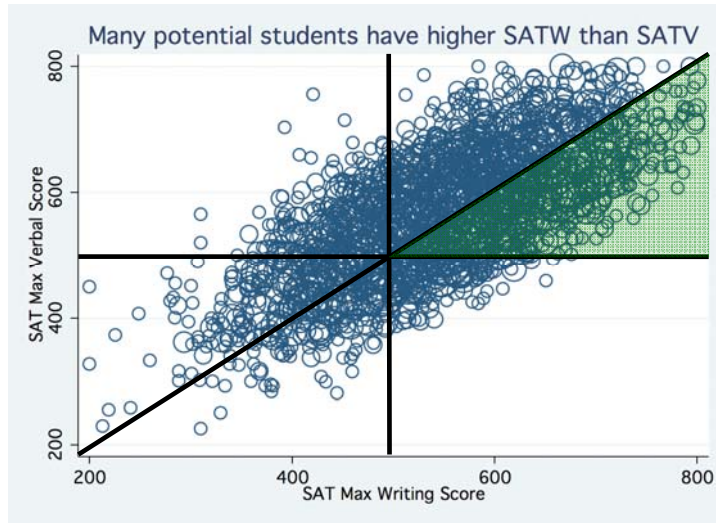
	Model 1		Model 2	
	APE	z	APE	z
HSGPA	-0.17	***-8.12	-0.16	***-7.77
SATV	-0.01	-0.48	0.02	1.53
SATM	-0.03	** -3.29	-0.02	*-2.33
SATW			-0.04	** -3.01
N	2144		2144	
~R ²	0.07		0.07	

- SATW best of SATs (100 points implied 4% less chance)
- SATV said nothing (before or after)

Results – College Stratifications and SAT Formulation

- College stratifications
 - HSGPA continued to be most powerful indicator for colleges
 - Liberal arts, business administration, and science and engineering (traditional majors) had strongest link to SAT scores
 - Fine arts not able to estimate a relationship
 - SATW strongest relationship for liberal arts (most writing), but also mattered for business administration and science students
- Average SAT scores best predictor, followed by Max, Min, First

Discussion – 2009 Applicant Pool



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So, what does it all mean? What are the implications? Here is LMU's 2009 applicant pool in terms of their SATV and SATW scores. Notice how the line $SATV = SATW$ demonstrates there are generally higher SATV scores, with a majority of the data above the line. However, there were many potential students that had a higher SATW (below the line).

Now, we've got our standards. Normal admit students pretty much don't get in without a 500 on the SATV. And we probably would hold the same sort of standard for the SATW if we elected to use that instead. So these students enclosed in this triangle really are our potential winners under a policy decision to give a preference to SATW over SATV. The further from the diagonal, the larger the preference would be.

Which students would have taken us up on an offer had we chosen them based on SATW instead? We won't know, but even very modest assumptions demonstrate that certain outcomes would have benefited. For example, assuming we could get every matriculate 10 more points on their writing score (and just simply ignoring verbal), about 5 fewer students in the incoming freshmen class would have been on probation in their first semester. First-year GPA would have improved by $1/20^{\text{th}}$ of a point (small).

A third party, Maguire and Associates, also investigated how such a change would impact diversity in the incoming class and found no differences.

It appears there would be a very modest improvement in the performance of the incoming class if such a change were implemented.

Conclusions

- HSGPA still reigns the champion of available predictors
- SATW universally the best of the SAT scores for predictions
 - One exception in retention modeling, but index says very little anyway
 - SATV relationship tends to zero as SATW is introduced
- Simple admissions index fix: Swap SATW for SATV
 - Consonant with UC proposal

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Results – Bonus Regressions on Income and SES

	Model 1		Model 2 (log income)		Model 3 (ZIP imputed log income)		Model 4 (High School fixed effects)	
	Coef	<i>t</i>	Coef.	<i>t</i>	Coef.	<i>t</i>	Coef.	<i>t</i>
HSGPA	0.83	18.8	0.80	15.8	0.83	18.9	0.99	15.8
SATV	-0.01	-0.2	0.01	0.4	-0.01	-0.2	0.02	0.5
SATM	0.06	3.2	0.08	3.3	0.06	2.7	<0.01	<0.1
SATW	0.14	5.0	0.14	4.6	0.14	5.0	0.12	3.5
ln(AGI)			0.03	1.9	0.05	2.7		
i.HS							N/A	N/A
N	2144		1602		2140		2144	
Adj.R ²	0.19		0.22		0.20		0.27	

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Questions?

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