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Moving from SAT® Test Level to Section Level Score Use for Admissions and Placement Decisions

A "How-To" Guide

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College Board Research Department

Overview

The College Board is streamlining the scores reported on the digital SAT® Suite based on feedback from educators and students about what's most useful for them. When the digital SAT launches, we will provide the total score (400−1600 scale) and the section scores (Math and Evidenced-Based Reading and Writing on a 200−800 scale). With our goal to make the test shorter and more relevant to students, we will no longer provide test level scores for Reading, Writing and Language, and Math. For institutions that have relied on SAT test level scores for admissions or placement decisions, this document will help you understand how to use the SAT Evidence-Based Reading and Writing (ERW) *section* scores for these purposes going forward.

General Methodology

The score points at which institutions make admissions and placement decisions are commonly set using logistic regression. Institutions want to know if a student is likely to meet a desired outcome of success, such as earning a first-year grade point average (FYGPA) of 2.5 or higher or a certain grade or higher in a specific college course (e.g., a grade of "C" or higher in First-Year Writing Seminar). Logistic regression allows an institution to determine a student's likelihood of success using one or more predictors, including SAT scores and high school GPA (HSGPA). Regardless of which SAT scores institutions use, the methodology remains the same. (The appendix presents a more detailed explanation of logistic regression, as well as worked examples.)

Using a Single Predictor or Score

When using a single predictor (e.g., SAT ERW score) for admissions or placement decisions, institutions will typically arrive at one score of interest for that use. To do this:

1. An institution should set their desired student outcome for the use case. For example, an institution may set their outcome as a 75% chance (or .75 probability) of earning an English 101 course grade of 2.0 or higher.
2. Using their current or previous first-year students' SAT ERW scores and English 101 course grades, the institution applies logistic regression to determine students' chances

of earning an English course grade of 2.0 or higher at each score point on the SAT ERW score scale.

3. The point on the SAT ERW score scale at which students have at least a 75% chance of earning an English 101 course grade of 2.0 is then set as the placement score of interest for that measure.

Using Multiple Predictors

Though institutions may use a single measure as a predictor for admissions and placement decisions, multiple measures provide more information about a student than a single predictor. When using multiple measures, however, there will never be a single test score identified for admission or placement as a multiple measures model is a compensatory model. That is, a high score on one measure (e.g., SAT ERW) may offset a low score on another measure (e.g., HSGPA). Students with different scores on two predictors may have the same chance of success in achieving the desired outcome, such as an English 101 course grade of 2.0 or higher.

Next Steps

For institutions that have established special admissions or placement scores for SAT Reading or SAT Writing and Language scores, conducting identical analyses with SAT ERW section scores from the current SAT will allow them to start the transition to using SAT section scores prior to the arrival of the digital SAT.

In addition, College Board provides a free online service for higher education institutions and systems (Admitted Class Evaluation Service™, ACES™ at aces.collegeboard.org) to conduct campus or system-specific validity studies, with outcomes such as FYGPA, course grades, retention, and completion, that meet your specific institutional needs.

Our College Board Research department is also happy to discuss ways to study and operationalize the use of SAT scores for your enrollment-related decisions. You can contact us for assistance at validity@collegeboard.org.

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Appendix: Estimating the Probability of Success Using Logistic Regression

Logistic regression is the common approach to determining a student's probability of success in a given task, be it earning a specific course grade, earning a certain FYGPA, or returning to the institution for the second year. Various software programs, including SAS, R, SPSS, and Stata, offer simple ways to accomplish the solutions below. The worked examples that follow are provided to generally assist institutions in conducting and understanding their own similar analyses; *the data below are not meant to be used for setting actual institutional placement policies*.

Using a Single Predictor

When using a single predictor, the predicted probability of success (*p*) is estimated as follows.

$$p = e^{a + bX}/(1 + e^{a + bX})$$

where

e = base of the natural logarithm

a = estimated intercept

b = regression coefficient

X = predictor

For example, an institution has used the SAT Reading Test for placement into its English 101 course, and the institution used an SAT Reading Test score at which students had a 75% chance (an estimated .75 probability) of earning a grade of 2.0 "C" or higher in the course. The institution now wants to establish an SAT ERW section score for placement purposes in its English 101 course. When using SAT ERW section scores to predict students' probability of earning a course grade of 2.0 "C" or higher, the institution obtained the following parameter estimates.

N	Intercept	SAT ERW
831	-2.6564	0.00794

For each SAT ERW section score, the institution could then estimate the probability of earning a course grade of 2.0 "C" or higher.

$$p = e^{-2.6564 + 0.00794X}/(1 + e^{-2.6564 + 0.00794X})$$

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Results for all SAT ERW section scores are provided below in Table 1.

Table 1. Probability of Earning an English 101 Course Grade of 2.0 "C" or Higher Given SAT ERW Section Score				
N	831			
Intercept (*a*)	-2.6564			
SAT ERW (*b*)	0.00794			
ERW Section Score (*X*)	Probability		ERW Section Score (*X*)	Probability
800	.98		490	.77
790	.97		480	.76
780	.97		470	.75
770	.97		460	.73
760	.97		450	.71
750	.96		440	.70
740	.96		430	.68
730	.96		420	.66
720	.96		410	.65
710	.95		400	.63
700	.95		390	.61
690	.94		380	.59
680	.94		370	.57
670	.93		360	.55
660	.93		350	.53
650	.92		340	.51
640	.92		330	.49
630	.91		320	.47
620	.91		310	.45
610	.90		300	.43
600	.89		290	.41
590	.88		280	.39
580	.88		270	.37
570	.87		260	.36
560	.86		250	.34
550	.85		240	.32
540	.84		230	.30
530	.83		220	.29
520	.81		210	.27
510	.80		200	.26
500	.79			

If using only SAT ERW section scores for placement decisions, the score used to guide the institution's decisions regarding admission to English 101 would be an ERW score of 470.

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Using Multiple Predictors

Institutions or systems may want to use multiple measures to predict a student's probability of success. When using two predictors, we would include the parameter estimates for both measures to estimate a student's probability of success as follows.

$$p = e^{a + b1X1 + b2X2}/(1 + e^{a + b1X1 + b2X2})$$

Additional predictors can be added to the model in a similar fashion.

Extending the previous example, when using SAT ERW section scores and HSGPA to predict students' probability of earning an English 101 course grade of 2.0 "C" or higher, the institution obtained the following parameter estimates.

N	Intercept	HSGPA	SAT ERW
831	-5.9304	1.1094	0.00662

For each combination of HSGPA and SAT ERW section score, the institution could then estimate the probability of earning a course grade of 2.0 "C" or higher.

$$p = e^{-5.9304 + 1.1094X1 + 0.00662X2}/(1 + e^{-5.9304 + 1.1094X1 + 0.00662X2})$$

Results for selected HSGPA and SAT ERW section scores are presented in Table 2. As mentioned earlier, a multiple measure model is a compensatory model. In other words, rather than a single decision score for each measure there is a sliding scale on which multiple combinations of scores on the measures may result in the same probability of success. For example, a student with a HSGPA of 4.0 and an SAT ERW score of 400 has an estimated probability of .76, as do students with a HSGPA of 3.4 and an SAT ERW score of 500, a HSGPA of 2.8 and an SAT ERW score of 600, and a HSGPA of 2.2 and an SAT ERW score of 700.

Table 2. Probability of Earning an English 101 Course Grade of 2.0 "C" or Higher Given SAT ERW Section Score and HSGPA							
N	831						
Intercept (a)	-5.9304						
HSGPA (b₁)	1.1094						
SAT ERW (b₂)	0.00662						
	SAT ERW Score (X_2)						
HSGPA (X_1)	200	300	400	500	600	700	800
2.0	.08	.15	.26	.40	.56	.72	.83
2.1	.09	.17	.28	.43	.59	.74	.84
2.2	.10	.18	.30	.46	.62	.76	.86
2.3	.11	.20	.33	.48	.64	.78	.87
2.4	.13	.22	.35	.51	.67	.80	.88
2.5	.14	.24	.38	.54	.69	.81	.89
2.6	.15	.26	.40	.57	.72	.83	.90
2.7	.17	.28	.43	.59	.74	.85	.91
2.8	.18	.30	.46	.62	.76	.86	.92
2.9	.20	.33	.48	.64	.78	.87	.93
3.0	.22	.35	.51	.67	.80	.88	.94
3.1	.24	.38	.54	.69	.81	.89	.94
3.2	.26	.40	.57	.72	.83	.90	.95
3.3	.28	.43	.59	.74	.85	.91	.95
3.4	.30	.46	.62	.76	.86	.92	.96
3.5	.33	.48	.65	.78	.87	.93	.96
3.6	.35	.51	.67	.80	.88	.94	.97
3.7	.38	.54	.69	.82	.90	.94	.97
3.8	.40	.57	.72	.83	.91	.95	.97
3.9	.43	.59	.74	.85	.91	.95	.98
4.0	.46	.62	.76	.86	.92	.96	.98
4.1	.49	.65	.78	.87	.93	.96	.98
4.2	.51	.67	.80	.88	.94	.97	.98
4.3	.54	.70	.82	.90	.94	.97	.98