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Validity of the SAT® for Predicting First-Year Grades: 2013 SAT Validity Sample

Jonathan Beard, associate psychometrician

Jessica Marini, associate research scientist

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Executive Summary

The continued accumulation of validity evidence for the intended uses of educational assessment scores is critical to ensuring that inferences made using the scores are sound. To that end, the College Board has continued to collect college outcome data to evaluate the relationship between SAT® scores and college success. This report provides updated validity evidence for using the SAT to predict first-year college grade point average (FYGPA) for the 2013 cohort. It is important to note that a redesigned SAT was launched in March 2016. All data and references in this document to the SAT refer to the version previous to the 2016 redesigned SAT.

Colleges and universities (henceforth, "institutions") provided data on the cohort of first-time, first-year students enrolling in the fall of 2013. The College Board combined those college outcomes data with official SAT scores and SAT Questionnaire response data, which included students' self-reported high school grade point average, among other things. In particular, 162 institutions provided data on 306,713 students, 221,485 of whom had complete data on high school grade point average (HSGPA); SAT critical reading (SAT-CR), mathematics (SAT-M), and writing (SAT-W) scores; and FYGPA.

As has been shown in previous research (Beard & Marini, 2015; Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008; Patterson, Mattern, & Kobrin, 2009; Patterson & Mattern, 2011; 2012; 2013a; 2013b), the multiple correlation of SAT section scores and HSGPA with FYGPA continues to be strong for the 2013 cohort (r = .61). When compared with the correlation of HSGPA alone with FYGPA (r = .53), the addition of the SAT section scores to HSGPA represented an increase (Δr = .08) in the correlation with FYGPA. The patterns of differential validity by institutional and student characteristics and differential prediction by student characteristics for the 2013 cohort also follow the same general patterns, as has been shown in previous research (Beard & Marini, 2015; Mattern, Patterson, Shaw, Kobrin, & Barbuti, 2008; Patterson et al., 2009; Patterson & Mattern, 2011; 2012; 2013a; 2013b).

Note that this statistical report is the latest in a series that provides SAT validity evidence. The results continue to add to the previously published reports (Beard & Marini, 2015; Patterson, Mattern, & Kobrin, 2009; Patterson & Mattern, 2011; 2012; 2013a; 2013b). For further detail regarding the methods used, the original research reports are available (Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008;

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Mattern, Patterson, Shaw, Kobrin, & Barbuti, 2008). For further details regarding the interpretation of validity research and a summary of recent SAT validity evidence, a validity primer (Shaw, 2015) and synthesis of validity research are available (Mattern & Patterson, 2014).

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Table 1: Distribution of Institutional Characteristics

Institutional Characteristic		%
U.S. Region	Midwest	17
	Mid-Atlantic	23
	New England	12
	South	19
	Southwest	12
	West	16
Control	Public	46
	Private	54
Admittance Rate	Under 50%	22
	50% to 75%	51
	Over 75%	27
Undergraduate Enrollment	Small	19
	Medium	40
	Large	19
	Very Large	22

Note: Number of institutions (K) = 162. Percentages may not sum to 100 due to rounding. Undergraduate enrollment was categorized as follows: small: 750 to 1,999; medium: 2,000 to 7,499; large: 7,500 to 14,999; and very large: 15,000 or more.

- Table 1 shows that the sample of 162 four-year institutions was diverse with respect to region of the U.S., control, size, and undergraduate admittance rate.

Table 2: Descriptive Statistics for Total Sample

Variable	*M*	*SD*
HSGPA	3.65	0.486
SAT-CR	554	98.3
SAT-M	574	101.0
SAT-W	548	99.8
FYGPA	3.04	0.714

Note: Number of students (N) = 221,485.

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- When compared to the 2012 cohort, Table 2 shows similar mean performance for high school grade point average (HSGPA) and first-year grade point average (FYGPA) for the 2012 cohort, with means differing by at most 0.03. The mean SAT section scores are also quite similar, differing by no more than one point for any one section (Patterson & Mattern, 2013b; Beard & Marini, 2015).

- When compared with the population of all college-bound SAT takers expecting to graduate in 2013 (n = 1,660,047)—whose mean and standard deviation (SD) SAT critical reading (SAT-CR), mathematics (SAT-M), and writing scores (SAT-W) were 496 (115 SD), 514 (118 SD), and 488 (114 SD), respectively (College Board, 2013)—the sample in this study performed better in terms of SAT section scores. Given that students in this subsample not only chose to take the SAT—as did the population of over 1.6 million college-bound seniors—but also applied to, enrolled at, and earned grades at a four-year institution, their higher mean SAT section scores followed the expected pattern.

Table 3: Fixed (Raw) Correlation Matrix of SAT, HSGPA, and FYGPA

Variable	HSGPA	SAT-CR	SAT-M	SAT-W	FYGPA
HSGPA		.45	.49	.48	.53
SAT-CR	(.20)		.73	.85	.47
SAT-M	(.22)	(.51)		.75	.48
SAT-W	(.22)	(.70)	(.53)		.51
FYGPA	(.34)	(.27)	(.27)	(.32)	

Note: Number of students (N) = 221,485. Pooled within-institution, restriction of range corrected correlations are presented. The raw correlations are shown in parentheses.

- Table 3 shows the restriction of range corrected and raw correlations among the four predictors examined in this study: HSGPA, SAT-CR, SAT-M, and SAT-W, as well as FYGPA. In general, SAT sections were more highly correlated with other sections than with HSGPA, and this is most prominent in the correlation of SAT-CR and SAT-W.

- The bivariate correlations shown in Table 3 are similar to what was estimated in previous research (Beard & Marini, 2015; Kobrin et al., 2008; Patterson et al., 2009; Patterson & Mattern, 2011; Patterson & Mattern, 2012; Patterson & Mattern, 2013a, 2013b).

- Consistent with prior research, the SAT writing section had the highest correlation with FYGPA among the three SAT section scores (Beard & Marini, 2015; Kobrin et

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al., 2008; Patterson et al., 2009; Patterson & Mattern, 2011; Patterson & Mattern, 2012; Patterson & Mattern, 2013a, 2013b).

Table 4: Corrected (Raw) Multiple Correlations of Predictors with FYGPA

Predictor(s)	Correlation
1. SAT-M, SAT-CR	.52 (.31)
2. HSGPA, SAT-M, SAT-CR	.60 (.42)
3. SAT-CR, SAT-M, SAT-W	.54 (.35)
4. HSGPA, SAT-CR, SAT-M, SAT-W	.61 (.43)

Note: Number of students (N) = 221,485. Multiple correlations are based on the raw and corrected correlations presented in Table 3. The raw correlations are shown in parentheses.

- SAT-CR, SAT-M, and SAT-W jointly have a similar multiple correlation with FYGPA (.54) as does HSGPA with FYGPA (.53). It is, however, the inclusion of all four predictors that leads to the strongest linear relationship with FYGPA; namely a multiple correlation of .61.

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Figure 1: Mean FYGPA by SAT score band
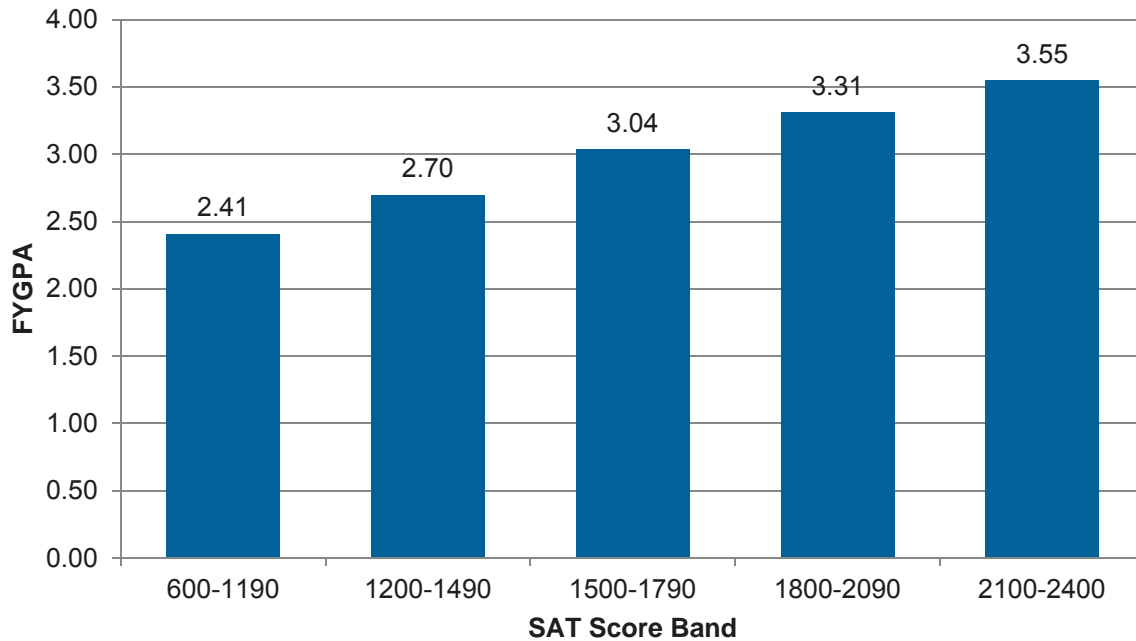
Note: SAT score bands are based on the sum of SAT-CR, SAT-M, and SAT-W. Sample sizes by SAT score band were as follows:

SAT	n
600–1190	8,296
1200–1490	49,387
1500–1790	87,931
1800–2090	62,788
2100–2400	13,083

- Figure 1 shows graphically the positive relationship between the composite SAT score band (i.e., sum of SAT-CR, SAT-M, and SAT-W, grouped into meaningful categories) with mean FYGPA. In particular, the difference in mean FYGPA between the highest score band (2100–2400) and the lowest (600–1190) was 1.14. In other words, students in the highest SAT score band earned, on average, an FYGPA of A- compared to students in the lowest SAT score band, who had an average FYGPA of C+.

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Figure 2: Percentage of students earning FYGPA of a B or higher by SAT score band
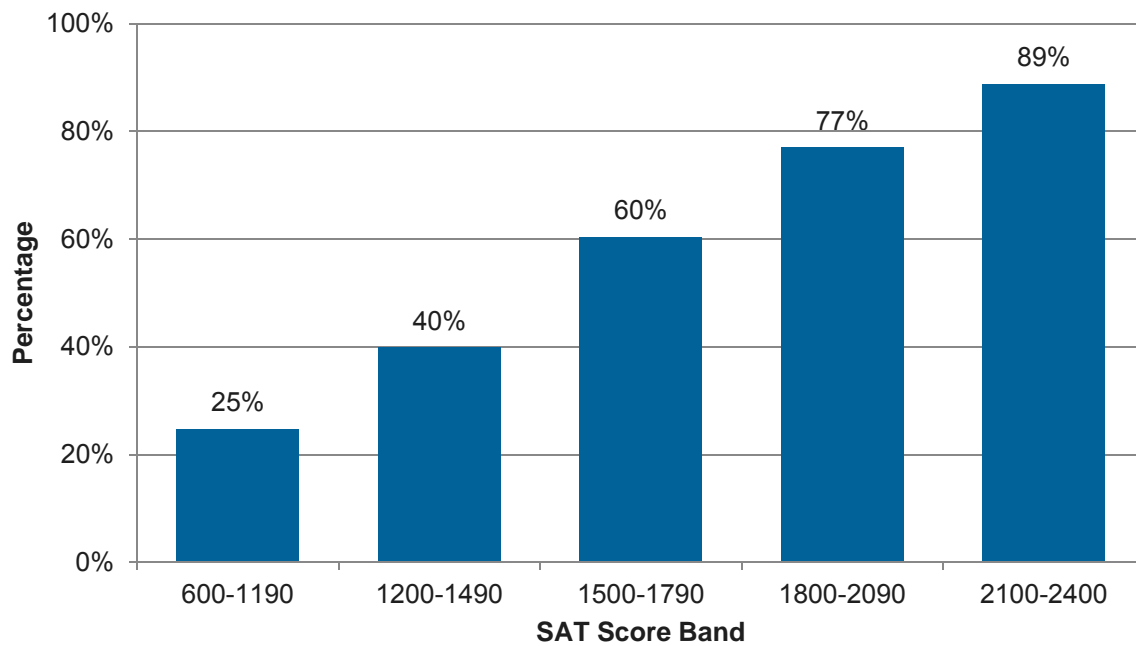
Note: SAT score bands are based on the sum of SAT-CR, SAT-M, and SAT-W. Students whose FYGPA was ≥ 3.00 were considered to have earned a B or better. Sample sizes by SAT score band were as follows:

SAT	n
600–1190	8,296
1200–1490	49,387
1500–1790	87,931
1800–2090	62,788
2100–2400	13,083

- Figure 2 shows graphically the positive relationship between the percentage of students earning at least a B (i.e., 3.0 FYGPA or higher) in their first year of college with the composite SAT score band. In particular, over three and a half times the number of students in the highest SAT score band (2100–2400) earned at least a B, relative to those in the lowest (600–1190).

Figure 3: Incremental validity of the SAT: Mean FYGPA by SAT score band controlling for HSGPA
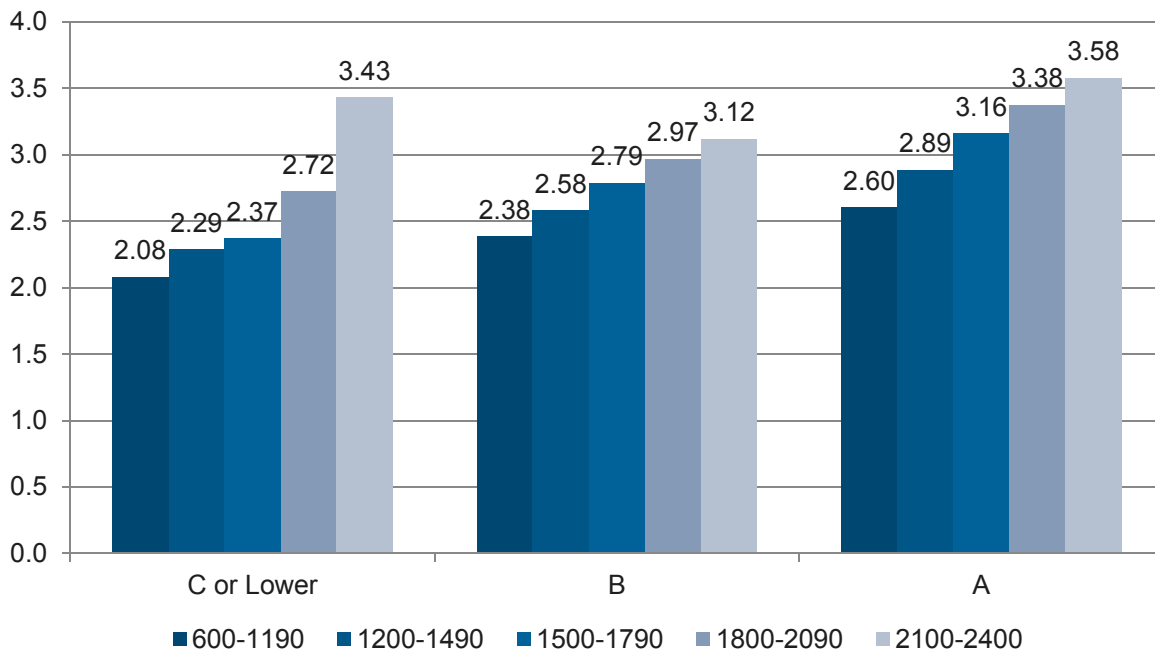
Note: SAT score bands are based on the sum of SAT-CR, SAT-M, and SAT-W. HSGPA ranges were defined as follows:

"A" range: 4.33 (A+), 4.00 (A), and 3.67 (A-)

"B" range: 3.33 (B+), 3.00 (B), and 2.67 (B-)

"C or Lower" range: 2.33 (C+) or lower

Sample sizes by HSGPA and SAT score band were as follows:

	HSGPA		
SAT	**C or Lower**	**B**	**A**
600–1190	942	5,188	2,166
1200–1490	2,372	25,825	21,190
1500–1790	1,149	26,880	59,902
1800–2090	255	9,702	52,831
2100–2400	21	920	12,142

- Figure 3 shows the relationship of composite SAT score band with mean FYGPA at different levels of HSGPA. For each level of HSGPA, higher composite SAT score bands are associated with higher mean FYGPAs, thus demonstrating the value of SAT above and beyond HSGPA in the prediction of FYGPA.

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- Consider, for example, two students with HSGPAs in the A range. The one whose SAT composite was 600–1190 was expected to earn an FYGPA of 2.6, which translates to roughly a B-, while the other student, whose SAT composite was 2100–2400, was expected to earn an FYGPA of 3.6, which translates to roughly an A-.

Table 5: Descriptive Statistics of Study Variables by Institutional Characteristics

Institutional Characteristic		k	n	SAT-CR M	SAT-CR SD	SAT-M M	SAT-M SD	SAT-W M	SAT-W SD	HSGPA M	HSGPA SD	FYGPA M	FYGPA SD
Control	Private	87	60,595	575	98.7	593	99.3	573	100.8	3.67	0.471	3.18	0.594
	Public	75	160,890	546	97.0	567	100.7	538	97.7	3.64	0.491	2.99	0.748
Admittance Rate	Under 50%	36	55,747	609	88.9	635	87.0	610	91.4	3.85	0.374	3.26	0.537
	50% to 75%	82	130,737	543	93.6	562	96.0	533	93.5	3.63	0.483	3.00	0.741
	Over 75%	44	35,001	511	93.3	520	93.0	501	89.7	3.41	0.529	2.86	0.775
Undergraduate Enrollment	Small	31	8,364	536	100.0	540	98.3	526	98.2	3.54	0.530	3.03	0.688
	Medium	64	40,876	541	103.8	554	104.6	536	104.4	3.55	0.521	3.03	0.733
	Large	31	53,155	550	100.8	566	105.1	544	104.2	3.59	0.502	3.01	0.729
	Very Large	36	119,090	562	94.3	586	95.9	555	95.5	3.72	0.450	3.07	0.701
Total		162	221,485	554	98.3	574	101.0	548	99.8	3.65	0.486	3.04	0.714

Note: k: number of institutions, n: subgroup sample size. Undergraduate enrollment was categorized as follows: small: 750 to 1,999; medium: 2,000 to 7,499; large: 7,500 to 14,999; and very large: 15,000 or more.

- Table 5 provides summary statistics on the key study variables by institutional characteristics.

- It shows that, in general, mean SAT section scores, HSGPA, and FYGPA were higher:

  o at private institutions, compared to public institutions; and

  o at increasingly selective institutions (i.e., those that admit fewer applicants).

- In terms of undergraduate enrollment (i.e., institution size):

  o small institutions had the lowest mean SAT section scores, while very large institutions had the highest mean SAT section scores and HSGPAs; and there is no discernable relationship between institution size and mean FYGPA.

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Table 6: Corrected Correlations of SAT and HSGPA with FYGPA by Institutional Characteristics

Institutional Characteristic		*k*	*n*	SAT-CR	SAT-M	SAT-W	SAT*	HSGPA	SAT*, HSGPA
Control	Private	87	60,595	0.52	0.52	0.56	0.58	0.56	0.65
	Public	75	160,890	0.46	0.47	0.50	0.52	0.52	0.60
Admittance Rate	Under 50%	36	55,747	0.51	0.52	0.55	0.58	0.53	0.64
	50% to 75%	82	130,737	0.46	0.47	0.50	0.53	0.53	0.61
	Over 75%	44	35,001	0.46	0.46	0.50	0.52	0.53	0.60
Undergraduate Enrollment	Small	31	8,364	0.54	0.54	0.57	0.60	0.59	0.68
	Medium	64	40,876	0.49	0.50	0.54	0.56	0.55	0.64
	Large	31	53,155	0.47	0.48	0.51	0.54	0.53	0.61
	Very Large	36	119,090	0.46	0.47	0.50	0.53	0.52	0.60
Overall		162	221,485	0.47	0.48	0.51	0.54	0.53	0.61

Note: *k*: number of institutions, *n*: subgroup sample size. SAT* refers to the inclusion of all three sections in the relevant multiple correlation. The correlations were corrected for restriction of range within institutions and pooled. Undergraduate enrollment was categorized as follows: small: 750 to 1,999; medium: 2,000 to 7,499; large: 7,500 to 14,999; and very large: 15,000 or more. For raw correlations by institutional characteristics, see Appendix B.

- Table 6 shows the correlations of various combinations of the predictors with FYGPA by key institutional characteristics.

- The correlations of the six combinations of predictors with FYGPA are generally:

    o Higher at private than public institutions

    o Highest at the most selective institutions (i.e., those that admit fewer than 50% of applicants), relative to less selective ones

    o Highest at small institutions, relative to larger ones

- Across many institutional categories, the multiple correlation of SAT with FYGPA was at least as high as the correlation of HSGPA with FYGPA.

- For nearly all institutional subgroups, the combination of SAT section scores and HSGPA represented an increase in at least .07 for the correlation with FYGPA over either predictor alone.

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Table 7: Descriptive Statistics of Study Variables by Student Characteristics

Student Characteristic		k	n	SAT-CR M	SAT-CR SD	SAT-M M	SAT-M SD	SAT-W M	SAT-W SD	HSGPA M	HSGPA SD	FYGPA M	FYGPA SD
Gender	Male	160	100,258	562	98.7	598	99.6	547	100.6	3.61	0.502	2.95	0.751
	Female	162	121,227	548	97.5	554	97.8	548	99.2	3.68	0.470	3.12	0.672
Racial/Ethnic Identity	African American	162	18,016	492	90.8	494	90.1	478	90.2	3.42	0.542	2.67	0.784
	American Indian	145	1,032	540	93.6	547	93.4	522	91.4	3.60	0.499	2.86	0.776
	Asian American	162	26,720	569	106.7	641	99.4	578	108.0	3.72	0.432	3.16	0.643
	Hispanic	162	26,644	512	97.9	527	97.0	505	95.6	3.57	0.508	2.86	0.745
	Other	159	6,213	563	101.9	577	103.6	558	102.3	3.63	0.478	3.03	0.715
	White	162	140,105	567	91.9	580	92.1	559	93.3	3.68	0.471	3.11	0.688
	Not Stated	157	2,755	548	104.4	573	109.3	545	104.0	3.58	0.557	2.98	0.725
Best Language	English Only	162	184,614	561	95.7	574	97.7	551	97.9	3.65	0.485	3.06	0.712
	English and Another	162	30,970	528	102.9	560	111.4	530	105.7	3.62	0.488	2.95	0.726
	Another Language	152	4,743	482	106.9	645	117.1	520	114.4	3.68	0.458	3.15	0.658
	Not Stated	147	1,158	525	104.4	560	115.1	523	105.5	3.54	0.606	2.94	0.764
Household Income	< $40,000	162	19,634	506	98.7	529	105.3	497	96.8	3.58	0.524	2.83	0.799
	$40,000–$80,000	162	24,163	540	94.5	556	98.3	528	94.3	3.63	0.507	2.95	0.757
	$80,000–$120,000	162	23,804	558	93.8	576	95.6	548	94.4	3.67	0.491	3.06	0.708
	$120,000–$160,000	162	12,030	566	92.0	585	92.9	558	93.3	3.66	0.484	3.09	0.673
	$160,000–$200,000	161	6,983	573	91.3	593	92.8	568	93.7	3.64	0.482	3.11	0.663
	> $200,000	162	12,643	590	89.8	613	90.0	590	92.1	3.66	0.458	3.16	0.616
	Not Stated	162	122,228	558	98.6	578	101.1	553	100.4	3.66	0.476	3.07	0.700
Highest Parental Education Level	No High School Diploma	156	7,200	472	93.1	510	106.2	469	90.3	3.53	0.510	2.79	0.754
	High School Diploma	162	41,256	515	91.9	535	97.2	506	91.4	3.57	0.514	2.86	0.783
	Associate Degree	162	14,071	524	89.0	539	92.5	512	88.9	3.61	0.505	2.91	0.767
	Bachelor's Degree	162	76,456	563	90.4	583	93.5	556	92.3	3.68	0.469	3.10	0.675
	Graduate Degree	162	67,564	593	93.1	610	95.1	588	95.6	3.72	0.453	3.19	0.638
	Not Stated	162	14,938	506	96.5	535	103.5	503	97.8	3.48	0.515	2.87	0.759
Total		162	221,485	554	98.3	574	101.0	548	99.8	3.65	0.486	3.04	0.714

Note: *n*: subgroup sample size.

- Table 7 shows that female students tended to outperform males on SAT-W, HSGPA, and FYGPA, while the opposite was true for SAT-CR and SAT-M.

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- Some differences exist across racial/ethnic identities, with white and Asian American students having higher mean SAT section scores, HSGPA, and FYGPA relative to African American and Hispanic students.

- When considering best spoken language, students whose best language was English had the highest SAT-CR and SAT-W scores, whereas students whose best language was something other than English had the highest SAT-M scores and slightly higher HSGPA and FYGPA means.

- Students who reported higher household incomes had higher mean SAT section scores and FYGPA, but there was no apparent relationship with HSGPA.

- As with household-income level, mean SAT section scores and FYGPA increased as highest parental education level increased; with respect to mean HSGPA, there was a positive relationship with highest parental education level.

Table 8: Corrected Correlations of SAT Scores and HSGPA with FYGPA by Student Subgroups

Student Characteristic		*k*	*n*	SAT-CR	SAT-M	SAT-W	SAT*	HSGPA	SAT*, HSGPA
Gender	Male	160	100,258	0.45	0.48	0.49	0.52	0.51	0.59
	Female	162	121,227	0.52	0.55	0.55	0.59	0.53	0.65
Racial/Ethnic Identity	African American	137	17,813	0.41	0.40	0.44	0.45	0.43	0.51
	American Indian	20	495	0.38	0.35	0.41	0.42	0.41	0.48
	Asian American	124	26,409	0.46	0.50	0.49	0.53	0.51	0.60
	Hispanic	141	26,472	0.43	0.42	0.46	0.48	0.46	0.54
	Other	101	5,770	0.46	0.48	0.51	0.53	0.49	0.59
	White	162	140,105	0.47	0.47	0.51	0.53	0.55	0.62
	Not Stated	67	2,161	0.38	0.40	0.43	0.44	0.43	0.50
Best Language	English Only	162	184,614	0.48	0.49	0.52	0.54	0.54	0.62
	English and Another	154	30,888	0.43	0.45	0.46	0.49	0.47	0.55
	Another Language	64	4,260	0.40	0.46	0.43	0.48	0.41	0.52
	Not Stated	25	569	0.35	0.30	0.39	0.40	0.40	0.47
Household Income	< $40,000	155	19,564	0.40	0.43	0.44	0.46	0.45	0.53
	$40,000–$80,000	160	24,142	0.45	0.46	0.50	0.52	0.52	0.60
	$80,000–$120,000	157	23,750	0.46	0.47	0.50	0.52	0.54	0.61
	$120,000–$160,000	135	11,764	0.45	0.44	0.49	0.50	0.55	0.60
	$160,000–$200,000	104	6,557	0.46	0.45	0.49	0.51	0.54	0.60
	> $200,000	108	12,289	0.45	0.47	0.49	0.52	0.55	0.61
	Not Stated	162	122,228	0.48	0.49	0.52	0.55	0.54	0.62
Highest Parental Education Level	No High School Diploma	71	6,616	0.42	0.44	0.44	0.47	0.44	0.52
	High School Diploma	159	41,228	0.44	0.45	0.48	0.50	0.49	0.57
	Associate Degree	142	13,919	0.44	0.46	0.48	0.50	0.52	0.59
	Bachelor's Degree	162	76,456	0.47	0.48	0.51	0.53	0.55	0.62

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Graduate Degree	162	67,564	0.48	0.48	0.52	0.54	0.55	0.63
Not Stated	145	14,794	0.41	0.43	0.45	0.47	0.47	0.54
Overall		162	221,485	0.47	0.48	0.51	0.54	0.53	0.61

Note: *k*: number of institutions, *n*: subgroup sample size. SAT* refers to the inclusion of all three sections in the relevant multiple correlation. The correlations were corrected for restriction of range within institutions and pooled. Institutions with fewer than 15 students in any subgroup were excluded. For raw correlations by institutional characteristics, see Appendix C.

- Table 8 shows that predictive validity for all predictors and combinations of FYGPA was higher for:

  - Female students than for male students;

  - White and Asian American students relative to the other racial/ethnic identities;

  - Students whose best spoken language was English only as compared to the other language groups;

  - Students with a household income level of at least $80,000 than those with lower incomes; and

  - Students whose parents have higher education levels as compared to lower education levels.

- Across all student subgroups, predictive validity of FYGPA was maximized using the combination of SAT section scores and HSGPA.

Table 9: Average Overprediction (-) and Underprediction (+) of FYGPA for SAT Scores and HSGPA

Student Characteristic		k	n	SAT-CR	SAT-M	SAT-W	SAT*	HSGPA	SAT*, HSGPA
Gender	Male	160	100,258	-0.109	-0.140	-0.089	-0.113	-0.070	-0.084
	Female	162	121,227	0.090	0.116	0.074	0.093	0.058	0.070
Racial/Ethnic Identity	African American	162	18,016	-0.195	-0.160	-0.164	-0.129	-0.197	-0.102
	American Indian	145	1,032	-0.137	-0.116	-0.110	-0.100	-0.146	-0.103
	Asian American	162	26,720	0.048	-0.040	0.024	-0.006	0.035	0.005
	Hispanic	162	26,644	-0.077	-0.067	-0.067	-0.049	-0.107	-0.046
	Other	159	6,213	-0.045	-0.033	-0.045	-0.040	-0.028	-0.031
	White	162	140,105	0.035	0.045	0.033	0.031	0.042	0.024
	Not Stated	157	2,755	-0.061	-0.065	-0.060	-0.060	-0.043	-0.043
Best Language	English Only	162	184,614	0.002	0.012	0.004	0.005	0.012	0.005
	English and Another	162	30,970	-0.041	-0.060	-0.049	-0.043	-0.075	-0.042
	Another Language	152	4,743	0.205	-0.045	0.158	0.105	0.044	0.101
	Not Stated	147	1,158	-0.039	-0.064	-0.036	-0.034	-0.044	-0.018
Household Income	< $40,000	162	19,634	-0.086	-0.091	-0.070	-0.059	-0.139	-0.073
	$40,000–$80,000	162	24,163	-0.041	-0.036	-0.030	-0.029	-0.060	-0.042
	$80,000–$120,000	162	23,804	0.009	0.012	0.013	0.009	0.009	0.002
	$120,000–$160,000	162	12,030	0.026	0.024	0.023	0.017	0.042	0.022
	$160,000–$200,000	161	6,983	0.013	0.013	0.006	0.003	0.055	0.028
	> $200,000	162	12,643	-0.002	-0.008	-0.015	-0.017	0.050	0.017
	Not Stated	162	122,228	0.017	0.017	0.013	0.013	0.020	0.014
Highest Parental Education Level	No High School Diploma	156	7,200	-0.048	-0.082	-0.036	-0.022	-0.145	-0.030
	High School Diploma	162	41,256	-0.069	-0.071	-0.058	-0.050	-0.104	-0.059
	Associate Degree	162	14,071	-0.042	-0.035	-0.030	-0.023	-0.082	-0.047
	Bachelor's Degree	162	76,456	0.031	0.031	0.028	0.025	0.036	0.024
	Graduate Degree	162	67,564	0.031	0.039	0.023	0.017	0.069	0.027
	Not Stated	162	14,938	-0.047	-0.067	-0.044	-0.036	-0.064	-0.019
Overall		162	221,485	0.000	0.000	0.000	0.000	0.000	0.000

Note: *k*: number of institutions, *n*: subgroup sample size. SAT* refers to the inclusion of all three sections in the relevant regression model. Negative and positive values indicate over- and

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underprediction, respectively. FYGPA regressions were estimated for each institution separately. Residuals were the difference of predicted and observed FYGPA.

- Table 9 shows that across all predictor sets, FYGPA was:

  o Overpredicted (i.e., observed FYGPA < predicted FYGPA) for males and underpredicted for females;

  o Generally overpredicted for African American, American Indian, and Hispanic students;

  o Generally underpredicted (except for SAT-M alone) for students whose best spoken language was not English; and

  o Overpredicted for students from lower socioeconomic status families (household income levels ≤ $80,000, highest parental education level of an associate degree or less).

- In terms of the relative differential prediction of HSGPA, SAT sections, and their combination:

  o Using HSGPA alone generally yielded the least differential prediction across genders;

  o Using HSGPA and SAT generally yielded the least differential prediction across racial/ethnic identities; and

  o Using SAT sections alone generally yielded the least differential prediction across household income and parental education levels.

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Appendix A: Institutions Providing First-Year Outcomes Data for the 2013 Cohort

Abilene Christian University

Appalachian State University

Austin College

Boston College

Boston University

Caldwell University

Capital University

Case Western Reserve University

Chapman University

Claremont McKenna College

Clemson University

Coastal Carolina University

Columbus State University

Cornell College

DePauw University

Earlham College

Eastern Connecticut State University

Eastern Washington University

Elms College

Emory University

Florida State University

Fordham University

Framingham State University

Franklin & Marshall College

Furman University

Georgia Institute of Technology

Georgia Southern University

Gonzaga University

Grinnell College

Indiana University - Purdue University Indianapolis

Indiana University Bloomington

Indiana University East

Indiana University Kokomo

Indiana University Northwest

Indiana University South Bend

Indiana University Southeast

John Brown University

Lafayette College

Lasell College

Lawrence University

Lehigh University

Lewis & Clark College

Long Island University Brooklyn

Long Island University Post

Longwood University

Lycoming College

Marywood University

Messiah College

Miami University

Missouri State University Springfield

Moravian College

North Carolina State University

Northwestern University

Penn State

Pennsylvania College of Technology

Philadelphia University

Portland State University

Presbyterian College

Purdue University

Queens University of Charlotte

Quinnipiac University

Randolph-Macon College

Rhode Island College

Saint Anselm College

Seton Hill University

Shenandoah University

Siena College

Skidmore College

Smith College

Southeastern University

Southern Connecticut State University

Southern Methodist University

Southwestern University

St. Edward's University

St. John's University

Stephen F. Austin State University

Stetson University

Stony Brook University

SUNY Polytechnic Institute

Taylor University

Texas A&M International University

Texas A&M University

Texas State University

Texas Woman's University

The Ohio State University

The State University of New York at New Paltz

Transylvania University

Tulane University

University of California, Santa Barbara

University of California, Santa Cruz

University of Cincinnati

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University of Colorado Colorado Springs

University of Dayton

University of Delaware

University of Denver

University of Evansville

University of Georgia

University of Houston

University of Massachusetts Dartmouth

University of Michigan

University of North Carolina at Greensboro

University of North Texas

University of Oregon

University of Pittsburgh

University of Rhode Island

University of Richmond

University of Southern California

University of Southern Indiana

University of Southern Maine

University of Texas at Austin

University of Utah

University of Vermont

University of Washington Tacoma

Vanderbilt University

Virginia Wesleyan College

Washington State University Vancouver

Washington State University, Pullman

Western Washington University

Wheaton College

Wilkes University

Willamette University

Wingate University

Institution A

Institution B

Institution C

Institution D

Institution E

Institution F

Institution G

Institution H

Institution I

Institution J

Institution K

Institution L

Institution M

Institution N

Institution O

Institution P

Institution Q

Institution R

Institution S

Institution T

Institution U

Institution V

Institution W

Institution X

Institution Y

Institution Z

Institution AA

Institution AB

Institution AC

Institution AD

Institution AE

Institution AF

Institution AG

Institution AH

Institution AI

Institution AJ

Institution AK

Institution AL

Institution AM

Institution AN

Note: There were 40 institutions that wished to remain anonymous, hence the listing of Institutions A through AN.

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Appendix B: Raw Correlations of SAT and HSGPA with FYGPA by Institutional Characteristics

Institutional Characteristic		*k*	*n*	SAT-CR	SAT-M	SAT-W	SAT*	HSGPA	SAT*, HSGPA
Control	Private	87	60,595	0.31	0.30	0.36	0.39	0.37	0.47
	Public	75	160,890	0.26	0.26	0.31	0.33	0.33	0.42
Admittance Rate	Under 50%	36	55,747	0.28	0.27	0.32	0.35	0.28	0.40
	50% to 75%	82	130,737	0.27	0.27	0.32	0.34	0.35	0.44
	Over 75%	44	35,001	0.29	0.27	0.34	0.35	0.40	0.47
Undergraduate Enrollment	Small	31	8,364	0.36	0.34	0.40	0.43	0.44	0.54
	Medium	64	40,876	0.30	0.29	0.35	0.38	0.39	0.47
	Large	31	53,155	0.26	0.27	0.31	0.34	0.35	0.43
	Very Large	36	119,090	0.26	0.26	0.31	0.33	0.32	0.41
Overall		162	221,485	0.27	0.27	0.32	0.35	0.34	0.43

Note: *k*: number of institutions, *n*: subgroup sample size. SAT* refers to the inclusion of all three sections in the relevant multiple correlation. Undergraduate enrollment was categorized as follows: small: 750 to 1,999; medium: 2,000 to 7,499; large: 7,500 to 14,999; and very large: 15,000 or more. For restriction of range corrected correlations by institutional characteristics, see Table 6.

Appendix C: Raw Correlations of SAT Scores and HSGPA with FYGPA by Subgroups

Student Characteristic		k	n	SAT-CR	SAT-M	SAT-W	SAT*	HSGPA	SAT*, HSGPA
Gender	Male	160	100,258	0.25	0.28	0.29	0.33	0.33	0.42
	Female	162	121,227	0.31	0.34	0.35	0.39	0.33	0.46
Racial / Ethnic Identity	African American	137	17,813	0.20	0.19	0.25	0.26	0.27	0.35
	American Indian	20	495	0.23	0.19	0.26	0.27	0.28	0.37
	Asian American	124	26,409	0.21	0.27	0.27	0.31	0.27	0.39
	Hispanic	141	26,472	0.23	0.21	0.26	0.28	0.27	0.36
	Other	101	5,770	0.26	0.28	0.34	0.36	0.30	0.42
	White	162	140,105	0.26	0.25	0.31	0.33	0.36	0.43
	Not Stated	67	2,161	0.22	0.23	0.30	0.32	0.29	0.39
Best Language	English Only	162	184,614	0.28	0.27	0.33	0.35	0.36	0.44
	English and Another	154	30,888	0.23	0.25	0.27	0.30	0.27	0.38
	Another Language	64	4,260	0.16	0.26	0.23	0.29	0.21	0.34
	Not Stated	25	569	0.25	0.20	0.31	0.32	0.30	0.40
Household Income	< $40,000	155	19,564	0.20	0.24	0.26	0.29	0.29	0.37
	$40,000–$80,000	160	24,142	0.26	0.26	0.32	0.34	0.36	0.43
	$80,000–$120,000	157	23,750	0.26	0.25	0.32	0.34	0.36	0.44
	$120,000–$160,000	135	11,764	0.25	0.22	0.30	0.31	0.37	0.43
	$160,000–$200,000	104	6,557	0.26	0.24	0.30	0.32	0.36	0.43
	> $200,000	108	12,289	0.21	0.23	0.27	0.29	0.34	0.41
	Not Stated	162	122,228	0.28	0.28	0.33	0.36	0.34	0.44
Highest Parental Education Level	No High School Diploma	71	6,616	0.20	0.24	0.22	0.27	0.24	0.34
	High School Diploma	159	41,228	0.24	0.25	0.30	0.32	0.32	0.40
	Associate Degree	142	13,919	0.24	0.26	0.30	0.32	0.36	0.43
	Bachelor's Degree	162	76,456	0.25	0.26	0.31	0.33	0.36	0.43
	Graduate Degree	162	67,564	0.26	0.25	0.31	0.33	0.35	0.43
	Not Stated	145	14,794	0.21	0.24	0.27	0.29	0.32	0.39
Overall		162	221,485	0.27	0.27	0.32	0.35	0.34	0.43

Note: k: number of institutions, n: subgroup sample size. SAT* refers to the inclusion of all three sections in the relevant multiple correlation. Institutions with fewer than 15 students in any subgroup were excluded. For restriction of range corrected correlations by student characteristics, see Table 8.

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