Statistical Report

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Validity of the SAT for Predicting Second-Year Grades:

2006 SAT Validity Sample

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The College Board

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Executive Summary

The College Board formed a research consortium with four-year colleges and universities to build a national higher education database with the primary goal of validating the revised SAT, which consists of three sections: critical reading (SAT-CR), mathematics (SAT-M) and writing (SAT-W), for use in college admission. The first sample examined was the first-time, first-year students entering college in fall 2006, with 110 institutions providing students' first-year coursework, grades, and retention to the second-year data. The results of the validity of the SAT for predicting first-year grade point average are summarized in the two College Board Research Reports, "Validity of the SAT for Predicting First-Year College Grade Point Average" (Kobrin et al., 2008) and "Differential Validity and Prediction of the SAT" (Mattern et al., 2008). The following year, participating colleges and universities were invited to provide second-year performance data for these students. For the second-year, a total of 66 of the original 110 institutions provided data. Please see the Appendix for a list of participating institutions.

This report presents the validity of the SAT for predicting two second-year outcomes: (1) second-year cumulative GPA (2nd Yr Cum GPA), and (2) second-year grade point average (2nd Yr GPA). Similar to the results for first-year grade point average (1st Yr GPA), the SAT is strongly correlated with second year outcomes. For many significant subgroups, such as ethnic minority students and female students, the SAT was in fact a better predictor of 2nd Yr Cum GPA and 2nd Yr GPA than were high school grades alone. However, for all students, SAT score in combination with high school grades was the best predictor of these second year outcomes since both measures provide incrementally validity over each other. For example, even within HSGPA levels, there is still a strong positive relationship between SAT and 2nd Yr Cum GPA and 2nd Yr. Detailed results are provided below.

Definitions

1. **First-year grade point average (1st Yr GPA)** – Average of grades earned in courses during the student's first year of college.
2. **Second-year grade point average (2nd Yr GPA)** – Average of grades earned in courses during the student's second year of college.
3. **Second-year cumulative grade point average (2nd Yr Cum GPA)** – Average of grades earned in courses during the student's first and second years of college.

References

College Board. (2006). 2006 College-Bound Seniors: Total Group Profile Report. New York, NY: The College Board.

Kobrin, J. L., Patterson, B. F., Shaw, E. J., Mattern, K. D., & Barbuti, S. M. (2008). Validity of the SAT® for predicting first-year college grade point average (College Board Research Rep. No. 2008-5). New York, NY: The College Board.

Mattern, K. D., Patterson, B. F., Shaw, E. J., Kobrin, J. L., & Barbuti, S. M. (2008). Differential validity and prediction of the SAT® (College Board Research Rep. No. 2008-4). New York, NY: The College Board.

Table 1

Comparison of the 2006 Sample with Second Year Data (k=66) and the Target Population

Institutional Characteristic		Percentage
U.S. Region	Midwest	11%
	Mid-Atlantic	21%
	New England	21%
	South	12%
	Southwest	11%
	West	24%
Control	Public	39%
	Private	61%
Selectivity	Admits under 50%	18%
	Admits 50 to 75%	58%
	Admits over 75%	24%
Size	Small	20%
	Medium	41%
	Large	21%
	Very large	18%

Note. k = number of institutions = 66. Percentages may not sum to 100 due to rounding. Institution sizes are categorized by the number of undergraduates 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.

- Of the 110 institutions from the original 2006 sample, 66 provided second-year data.
- The sample of 66 institutions was diverse with respect to region of the U.S., control, selectivity, and size.

Second Year Cumulative Grade Point Average (2nd Yr Cum GPA) Results

Table 2
Descriptive Statistics on the Total Sample

Variable	Mean	SD
HSGPA	3.63	0.49
SAT-CR	565	94
SAT-M	582	94
SAT-W	559	93
1st Yr GPA	3.03	0.66
2nd Yr Cum GPA	3.05	0.63

Note. N = number of students = 80,958

- Of the original 110 institutions, 66 provided second-year data for a total of 109,153 students. Students who did not have a valid HSGPA, new SAT scores, 1st Yr GPA, or 2nd Yr Cum GPA were removed from analyses resulting in a final sample size of 80,958.
- Similar to the finding of Kobrin et al. (2008), this sample outperformed the 2006 graduating seniors, whose mean SAT-CR, SAT-M and SAT-W were 503, 518, and 497, respectively, (College Board, 2006). These results were expected since the sample included only college students enrolled in a 4-year institution as compared to College Bound Seniors cohort which included students who never go to college and students who attend 2-year colleges.

Table 3
Corrected (Raw) Correlation Matrix of SAT and HSGPA

Variable	HSGPA	SAT-CR	SAT-M	SAT-W
HSGPA	-	0.45	0.49	0.49
SAT-CR	(0.20)	-	0.72	0.84
SAT-M	(0.21)	(0.49)	-	0.72
SAT-W	(0.23)	(0.71)	(0.49)	-

Note. N = number of students = 80,958. The correlations were corrected for restriction of range within institutions and pooled across institutions. The raw correlations are shown in parentheses.

- The correlations between all predictors were similar to what was presented in Kobrin et al. (2008).
- The corrected and raw multiple correlations of SAT-CR, SAT-M and SAT-W with HSGPA were 0.53 and 0.27, respectively.

Table 4

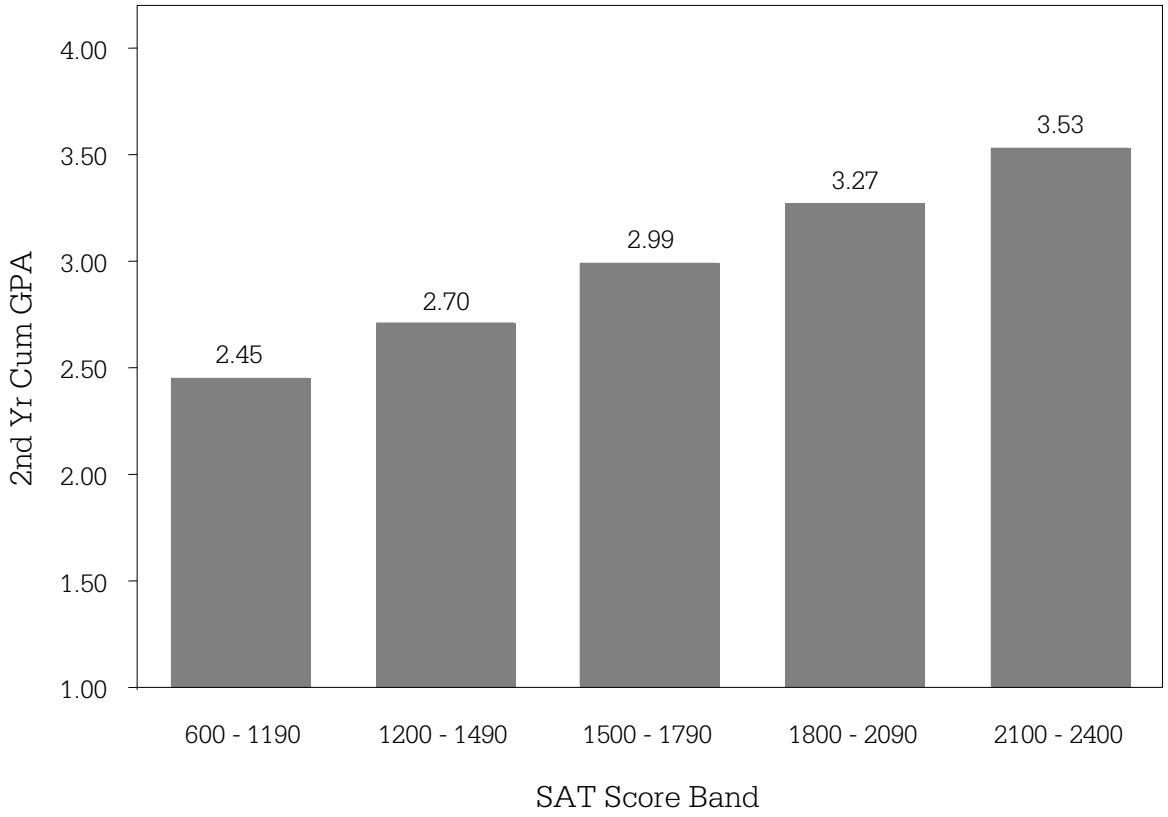
Corrected (Raw) Correlations of Predictors with 2nd Yr Cumulative GPA

Predictor(s)	Correlation
1. HSGPA	0.56 (0.37)
2. SAT-CR	0.50 (0.30)
3. SAT-M	0.49 (0.26)
4. SAT-W	0.53 (0.34)
5. SAT-M, SAT-CR	0.53 (0.33)
6. HSGPA, SAT-M, SAT-CR	0.63 (0.44)
7. SAT-CR, SAT-M, SAT-W	0.55 (0.36)
8. HSGPA, SAT-CR, SAT-M, SAT-W	0.64 (0.46)

Note. N = number of students = 80,958. Pooled within-institution, restriction of range corrected correlations are presented. The raw correlations are shown in parentheses.

- The raw and corrected correlations of SAT scores and HSGPA with 2nd Yr Cum GPA are generally **equal to or slightly higher** than the correlations of SAT scores and HSGPA with 1st Yr GPA that were reported in Kobrin et al., (2008).
- Similar to the results for 1st Yr GPA, the SAT writing section has the highest correlation with 2nd Yr Cum GPA (0.53) among the three sections.
- The corrected correlation of HSGPA and 2nd Yr Cum GPA (0.56) is slightly higher than the correlation of SAT scores and 2nd Yr Cum GPA (0.55).
- The incremental validity of SAT scores over HSGPA for predicting 2nd Yr Cum GPA is 0.08.

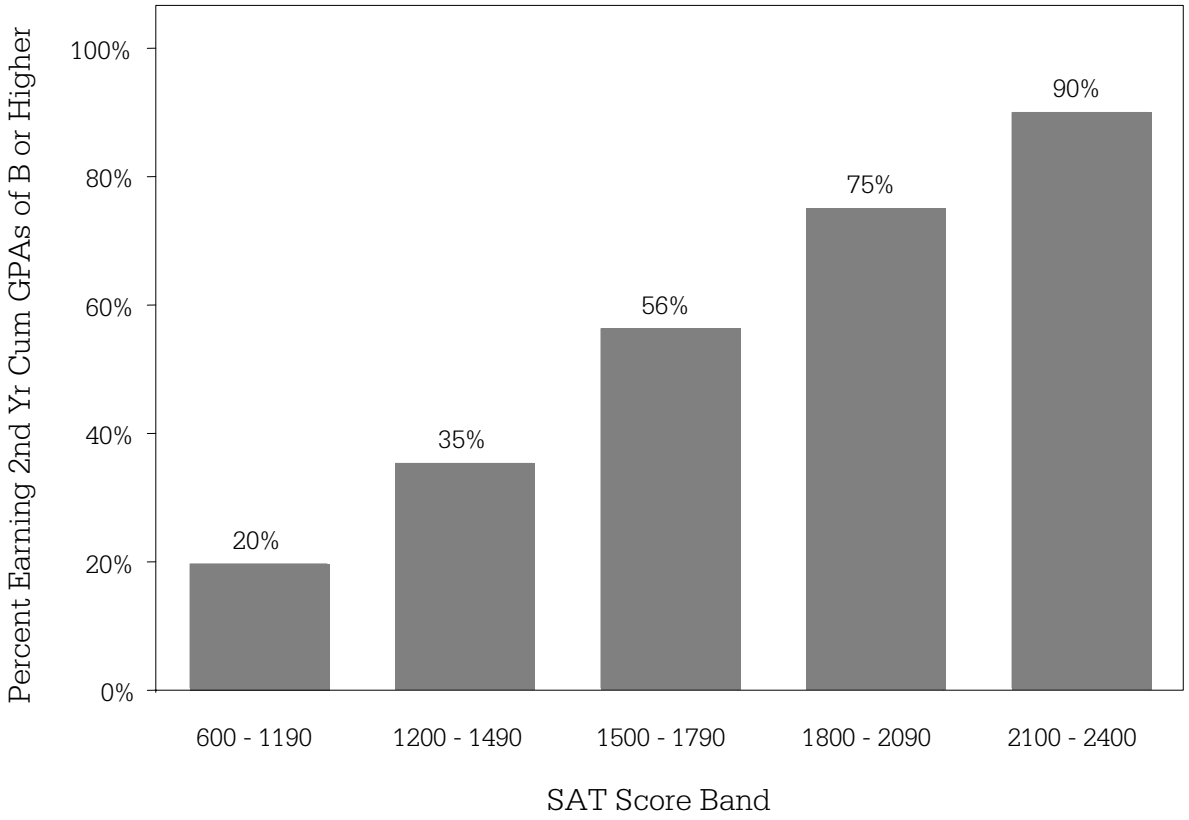
Figure 1
Mean 2nd Yr Cum GPA by SAT Score Band



Note. SAT score bands based on the sum of SAT-CR, SAT-M, and SAT-W. The sample sizes for the five SAT score bands: 1,358 for 600-1190; 15,616 for 1200-1490; 34,242 for 1500-1790; 24,700 for 1800-2090; and 5,042 for 2100-2400.

- Figure 1 presents the mean 2nd Yr Cum GPA of students by SAT score band. This graphically demonstrates the strong positive relationship between SAT scores and 2nd Yr Cum GPA.

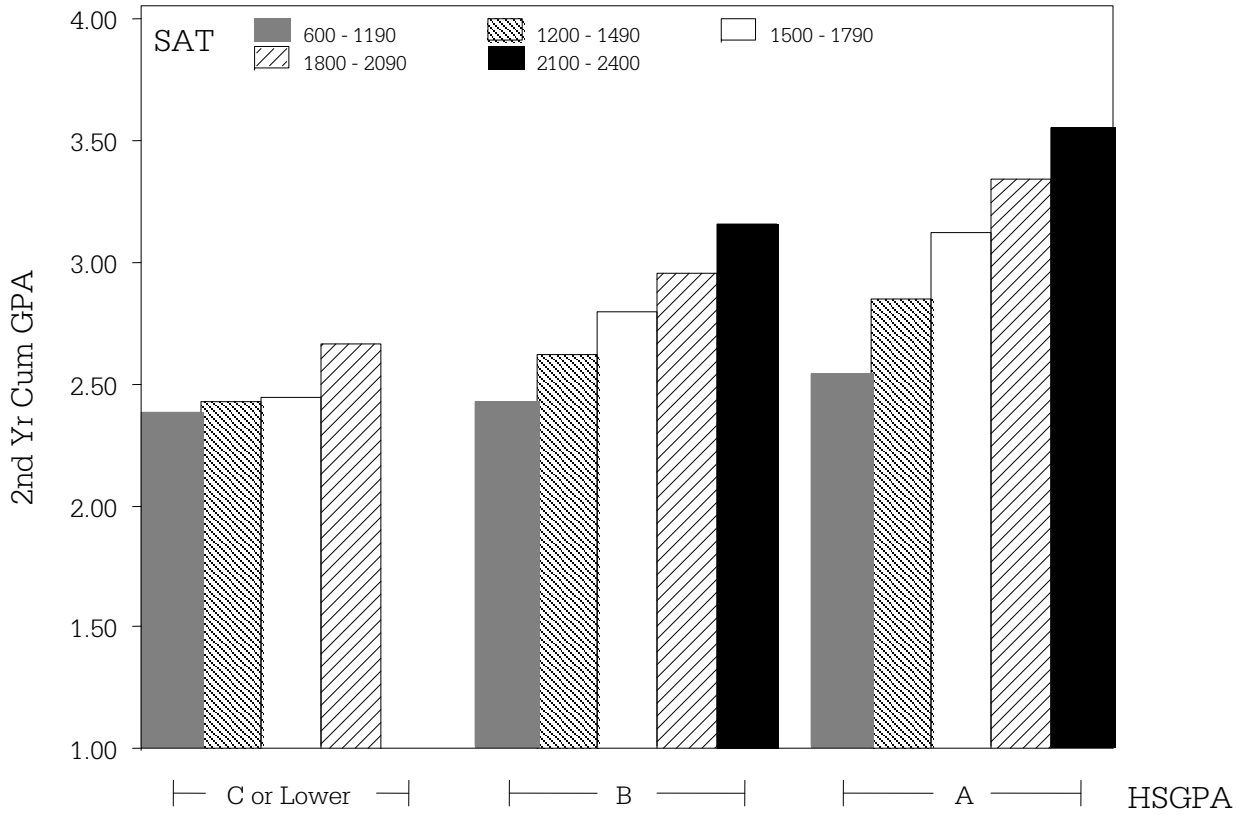
Figure 2
Percent of Students Earning a 2nd Yr Cum GPA of a B or Higher by SAT Score Band



Note. SAT score bands based on the sum of SAT-CR, SAT-M, and SAT-W. Students with 2nd Yr Cum GPAs ≥ 3.00 are considered to have earned a B or better. The sample sizes for the five SAT score bands: 1,358 for 600-1190; 15,616 for 1200-1490; 34,242 for 1500-1790; 24,700 for 1800-2090; and 5,042 for 2100-2400.

- Figure 2 presents the percent of students by SAT score band who had a 2nd Yr Cum GPA of B (3.0) or higher, and again the strong positive relationship between SAT scores and grades earned over the first two years of college is evident.

Figure 3
Incremental Validity of the SAT: Mean 2nd Yr Cum GPA by SAT Score Band Controlling for HSGPA



Note. SAT score bands based on the sum of SAT-CR, SAT-M, and SAT-W.HSGPA ranges are 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-); and "C or Lower" range: 2.33 (C+) and lower. Categories that include less than 15 students are not reported.

- Figure 3 presents students' mean 2nd Yr Cum GPA by SAT score band, controlling for HSGPA. Figure 3 graphically displays the unique information provided by SAT scores, controlling for HSGPA. Even within HSGPA levels, there is still a strong positive relationship between SAT and 2nd Yr Cum GPA. For example, of the students with a HSGPA equal to an A, those with an SAT total score from 600 to 1190 had a mean 2nd Yr Cum GPA of 2.55 as compared to a mean 2nd Yr Cum GPA of 3.56 for students with an SAT total score from 2100 and 2400.

Table 5

Descriptive Statistics of Study Variables by Institutional Characteristics

				SAT-CR		SAT-M		SAT-W		HSGPA		1st Yr GPA		2nd Yr Cum GPA	
Variable		**n**	**k**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Control	Private	28,415	40	593	95	605	94	591	94	3.67	0.46	3.14	0.55	3.16	0.53
	Public	52,543	26	550	90	569	92	542	87	3.61	0.50	2.97	0.70	2.98	0.67
Selectivity	Admits under 50%	11,782	12	627	90	641	86	628	88	3.77	0.42	3.26	0.48	3.29	0.45
	Admits 50 to 75%	55,577	38	561	89	580	91	554	87	3.65	0.47	3.00	0.67	3.01	0.65
	Admits over 75%	13,599	16	528	89	537	89	519	86	3.45	0.53	2.97	0.68	2.97	0.66
Size	Small	3,697	13	547	99	550	94	544	95	3.49	0.53	2.94	0.66	2.97	0.63
	Medium	16,958	27	577	100	586	99	573	98	3.61	0.49	3.14	0.59	3.15	0.57
	Large	25,231	14	548	91	568	96	540	90	3.53	0.51	2.96	0.66	2.97	0.64
	Very large	35,072	12	574	90	593	89	568	89	3.73	0.44	3.04	0.68	3.06	0.65
Total		80,958	66	565	94	582	94	559	93	3.63	0.49	3.03	0.66	3.05	0.63

Note. k = number of institutions, n = subgroup sample size. Institution sizes are categorized by the number of undergraduates 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.

- Students at private institutions had higher mean SAT scores, HSGPA, 1st Yr GPA, and 2nd Yr Cum GPA than those from public institutions.
- Students' mean SAT scores, HSGPA, 1st Yr GPA, and 2nd Yr Cum GPA increased as institutional selectivity increased (i.e., admittance rate decreased).
- Students attending very large and medium institutions had the highest mean SAT scores, HSGPA, 1st Yr GPA, and 2nd Yr Cum GPA compared to large and small institutions, though the differences were small.

Table 6

Corrected Correlations of SAT and HSGPA with 2nd Yr Cum GPA by Institutional Characteristics

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Control	Private	28,415	40	0.53	0.50	0.56	0.58	0.57	0.66
	Public	52,543	26	0.48	0.48	0.52	0.54	0.55	0.63
Selectivity	Admits under 50%	11,782	12	0.53	0.50	0.57	0.59	0.55	0.66
	Admits 50 to 75%	55,577	38	0.50	0.49	0.53	0.55	0.55	0.63
	Admits over 75%	13,599	16	0.48	0.46	0.51	0.53	0.57	0.64
Size	Small	3,697	13	0.53	0.52	0.56	0.59	0.58	0.67
	Medium	16,958	27	0.51	0.50	0.55	0.57	0.57	0.66
	Large	25,231	14	0.49	0.48	0.52	0.54	0.56	0.63
	Very large	35,072	12	0.49	0.48	0.53	0.55	0.55	0.63
Total		80,958	66	0.50	0.49	0.53	0.55	0.56	0.64

Note. k = number of institutions, n = subgroup sample size. The correlations were corrected for restriction of range within institutions and pooled across institution subgroups of at least 15. Institution sizes are categorized by the number of undergraduates 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. SAT refers to the inclusion of all three sections in the relevant multiple correlation.

- As was found for 1st Yr GPA in Kobrin, et al. (2008), the correlation between the SAT and 2nd Yr Cum GPA was generally:
  - slightly higher in private institutions compared to public institutions;
  - higher in more selective institutions (those admitting less than half of their applicants) compared to those that admit at least half of their applicants; and
  - higher in small institutions compared to larger institutions.
- The same pattern emerges for the correlations of HSGPA with 2nd Yr Cum GPA, albeit with smaller differences.
- Also similar to 1st Yr GPA results, the SAT is more predictive of 2nd Yr Cum GPA than HSGPA in private institutions, institutions admitting less than half of their applicants, and small institutions. The best predictor of 2nd Yr Cum GPA is the combination of both SAT scores and HSGPA.

Table 7

Raw Correlations of SAT and HSGPA with 2nd Yr Cum GPA by Institutional Characteristics

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Control	Private	28,415	40	0.33	0.27	0.37	0.39	0.39	0.48
	Public	52,543	26	0.28	0.26	0.33	0.35	0.36	0.45
Selectivity	Admits under 50%	11,782	12	0.35	0.27	0.39	0.41	0.36	0.47
	Admits 50 to 75%	55,577	38	0.28	0.25	0.33	0.35	0.35	0.45
	Admits over 75%	13,599	16	0.33	0.29	0.36	0.39	0.46	0.52
Size	Small	3,697	13	0.34	0.31	0.38	0.41	0.43	0.52
	Medium	16,958	27	0.31	0.26	0.35	0.37	0.39	0.48
	Large	25,231	14	0.28	0.25	0.33	0.35	0.38	0.46
	Very large	35,072	12	0.30	0.27	0.34	0.36	0.34	0.45
Total		80,958	66	0.30	0.26	0.34	0.36	0.37	0.46

Note. k = number of institutions, n = subgroup sample size. The correlations were pooled across institution subgroups of at least 15. Institution sizes are categorized by the number of undergraduates 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. SAT refers to the inclusion of all three sections in the relevant multiple correlation.

- Patterns in Table 7 are the same as those in Table 6, however correlations in this table were not corrected for restriction of range.

Table 8

Descriptive Statistics of Study Variables by Student Characteristics

			SAT-CR		SAT-M		SAT-W		HSGPA		1st Yr GPA		2nd Yr Cum GPA	
	Variable	**n**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Gender	Female	44,569	562	94	563	91	562	92	3.68	0.46	3.10	0.63	3.13	0.60
	Male	36,389	569	93	604	93	555	93	3.57	0.51	2.94	0.69	2.94	0.66
Race/ Ethnicity	American Indian or Alaska Native	419	550	88	557	89	536	89	3.55	0.51	2.88	0.67	2.88	0.64
	Asian, Asian-American, or Pacific Islander	7,835	568	101	623	97	567	100	3.69	0.46	3.07	0.65	3.08	0.62
	Black or African-American	4,728	509	88	507	87	501	86	3.45	0.54	2.67	0.68	2.69	0.65
	Hispanic, Latino, or Latin American	5,326	534	90	545	92	529	88	3.64	0.48	2.83	0.71	2.85	0.67
	White	56,604	571	91	585	90	564	90	3.64	0.48	3.07	0.64	3.09	0.62
	Other	2,410	563	94	575	95	559	95	3.60	0.49	2.99	0.66	3.00	0.65
	No Response	3,636	591	101	591	96	579	100	3.64	0.49	3.10	0.64	3.11	0.61
Best Language	English	75,671	568	93	582	93	561	92	3.63	0.49	3.03	0.66	3.05	0.63
	English and Another	3,727	542	99	577	106	545	101	3.66	0.48	2.96	0.66	2.98	0.62
	Another Language	748	471	98	606	112	486	102	3.67	0.49	3.11	0.63	3.12	0.58
	No Response	812	549	106	564	111	543	108	3.55	0.53	2.95	0.68	2.96	0.66
Total		80,958	565	94	582	94	559	93	3.63	0.49	3.03	0.66	3.05	0.63

Note. n = subgroup sample size.

- Males had higher SAT-CR and SAT-M scores whereas females had higher SAT-W scores, HSGPA, 1st Yr GPA, and 2nd Yr Cum GPA.
- Asian and White students outperformed other ethnic subgroups on all of the academic indicators.
- Students whose best spoken language was a language other than English had higher SAT-M scores, 1st Yr GPA, and 2nd Yr Cum GPA but lower SAT-CR and SAT-W scores relative to the other best language subgroups. Students whose best language was English and Another language had the lowest 1st Yr GPA and 2nd Yr Cum GPA.

Table 9

Corrected Correlation of SAT Scores and HSGPA with 2nd Yr Cum GPA by Student Subgroups

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Gender	Female	44,569	66	0.54	0.55	0.57	0.61	0.55	0.67
	Male	36,389	64	0.47	0.47	0.50	0.52	0.54	0.61
Race/ Ethnicity	American Indian or Alaska Native	168	8	0.53	0.56	0.58	0.61	0.56	0.67
	Asian, Asian-American, or Pacific Islander	7,720	49	0.44	0.46	0.47	0.50	0.49	0.57
	Black or African-American	4,614	48	0.43	0.42	0.46	0.48	0.47	0.55
	Hispanic, Latino, or Latin American	5,223	50	0.45	0.44	0.49	0.50	0.48	0.56
	White	56,604	66	0.49	0.47	0.52	0.54	0.58	0.64
	Other	2,214	42	0.48	0.44	0.50	0.52	0.49	0.58
	No Response	3,537	54	0.48	0.44	0.52	0.53	0.52	0.60
Best Language	English	75,671	66	0.51	0.49	0.54	0.56	0.57	0.65
	English and Another	3,550	44	0.43	0.45	0.47	0.50	0.44	0.54
	Another Language	502	15	0.30	0.32	0.35	0.36	0.34	0.40
	No Response	524	22	0.40	0.37	0.45	0.45	0.49	0.54
Total		80,958	66	0.50	0.49	0.53	0.55	0.56	0.64

Note. k = number of institutions, n = subgroup sample size. The correlations were corrected for restriction of range within institutions and pooled across institution subgroups of at least 15. SAT refers to the inclusion of all three sections in the relevant multiple correlation.

- For females and ethnic/best language minority students, the SAT is a better predictor of 2nd Yr Cum GPA than HSGPA alone.
- Adding SAT to HSGPA provides even greater incremental predictive validity for minority students than for white students.
- Both HSGPA and SAT scores were more predictive of college grades for females than males, for White students as compared to minority students (except for American Indians students but those results are based on a small sample size), and for students whose best language was English as compared to the other best language subgroups.

Table 10

Raw Correlation of SAT Scores and HSGPA with 2nd Yr Cum GPA by Subgroups

	Variable	n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Gender	Female	44,569	66	0.35	0.35	0.37	0.42	0.35	0.48
	Male	36,389	64	0.26	0.27	0.30	0.33	0.35	0.43
Race/ Ethnicity	American Indian or Alaska Native	168	8	0.28	0.30	0.37	0.40	0.35	0.49
	Asian, Asian-American, or Pacific Islander	7,720	49	0.24	0.26	0.28	0.32	0.29	0.39
	Black or African-American	4,614	48	0.23	0.21	0.27	0.29	0.30	0.38
	Hispanic, Latino, or Latin American	5,223	50	0.26	0.23	0.30	0.32	0.28	0.39
	White	56,604	66	0.28	0.22	0.32	0.34	0.39	0.46
	Other	2,214	42	0.29	0.23	0.31	0.33	0.31	0.41
	No Response	3,537	54	0.32	0.23	0.37	0.38	0.35	0.46
Best Language	English	75,671	66	0.30	0.26	0.34	0.37	0.38	0.47
	English and Another	3,550	44	0.26	0.28	0.31	0.34	0.24	0.38
	Another Language	502	15	0.17	0.18	0.23	0.25	0.20	0.29
	No Response	524	22	0.29	0.29	0.35	0.37	0.35	0.45
Total		80,958	66	0.30	0.26	0.34	0.36	0.37	0.46

Note. k = number of institutions, n = subgroup sample size. The correlations were pooled across institution subgroups of at least 15. SAT refers to the inclusion of all three sections in the relevant multiple correlation.

- Patterns in Table 10 are the same as those in Table 9; however, this table includes correlations that were not corrected for restriction of range.

Table 11

Average Over-prediction (-) and Under-prediction (+) of 2nd Yr Cum GPA for SAT Scores and HSGPA

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Gender	Female	44,569	66	0.09	0.11	0.07	0.09	0.05	0.06
	Male	36,389	64	-0.10	-0.14	-0.09	-0.11	-0.07	-0.08
Race/ Ethnicity	American Indian or Alaska Native	419	62	-0.12	-0.11	-0.10	-0.09	-0.11	-0.09
	Asian, Asian-American, or Pacific Islander	7,835	66	0.03	-0.03	0.02	0.01	0.01	0.01
	Black or African-American	4,728	64	-0.23	-0.21	-0.21	-0.17	-0.25	-0.14
	Hispanic, Latino, or Latin American	5,326	66	-0.11	-0.11	-0.10	-0.08	-0.17	-0.08
	White	56,604	66	0.03	0.03	0.02	0.02	0.04	0.02
	Other	2,410	66	-0.04	-0.03	-0.04	-0.03	-0.04	-0.02
	No Response	3,636	66	0.00	0.03	0.01	0.01	0.04	0.01
Best Language	English	75,671	66	0.00	0.00	0.00	0.00	0.00	0.00
	English and Another	3,727	66	-0.02	-0.06	-0.03	-0.02	-0.09	-0.02
	Another Language	748	58	0.25	0.02	0.24	0.23	0.04	0.20
	No Response	812	65	-0.06	-0.06	-0.05	-0.04	-0.06	-0.03
Total		80,958	66	0.00	0.00	0.00	0.00	0.00	0.00

Note. k = number of institutions, n = subgroup sample size. Negative values indicate over-prediction; positive values indicate under-prediction. 2nd Yr Cum GPA prediction equations were estimated for each institution separately. Individual residuals were computed by subtracting predicted raw 2nd Yr Cum GPA from actual raw 2nd Yr Cum GPA. SAT refers to all three sections being entered as separate predictors.

- SAT scores and HSGPA both over-predicted 2nd Yr Cum GPA for American Indian, African American and Hispanic students; however, SAT scores resulted in the same or less prediction error than HSGPA for all ethnic subgroups.
- SAT scores and HSGPA over-predicted 2nd Yr Cum GPA for males and under-predicted 2nd Yr Cum GPA for females. The same pattern of results was found for HSGPA, however, with smaller prediction error.
- Relative to HSGPA, the use of SAT scores resulted in less prediction error for students who best language was English only and English and another language but resulted in greater prediction error for students whose best language is another language.

Second Year Grade Point Average (2nd Yr GPA) Results

Table 12
Descriptive Statistics on the Total Sample

Variable	Mean	SD
HSGPA	3.65	0.48
SAT-CR	568	94
SAT-M	585	94
SAT-W	562	93
1st Yr GPA	3.08	0.60
2nd Yr GPA	3.07	0.69

Note. N = number of students = 75,208.

- Of the original 110 institutions, 66 provided second-year data for a total of 109,153 students. Students who did not have a valid HSGPA, new SAT scores, 1st Yr GPA, or 2nd Yr GPA were removed from analyses resulting in a final sample size of 75,208.
- Similar to above, the sample outperformed the cohort of SAT-takers that graduated from high school in 2006, whose mean SAT-CR, SAT-M and SAT-W were 503, 518, and 497, respectively, (College Board, 2006).

Table 13
Corrected (Raw) Correlation Matrix of SAT and HSGPA

Variable	HSGPA	SAT-CR	SAT-M	SAT-W
HSGPA	-	0.45	0.49	0.49
SAT-CR	(0.20)	-	0.72	0.84
SAT-M	(0.22)	(0.49)	-	0.72
SAT-W	(0.24)	(0.71)	(0.49)	-

Note. N = 75,208. Pooled within-institution, restriction of range corrected correlations are presented. The raw correlations are shown in parentheses.

- The correlations between all predictors were similar to what was presented in Kobrin et al. (2008).
- The corrected and raw multiple correlations of SAT-CR, SAT-M and SAT-W with HSGPA were 0.53 and 0.27, respectively.

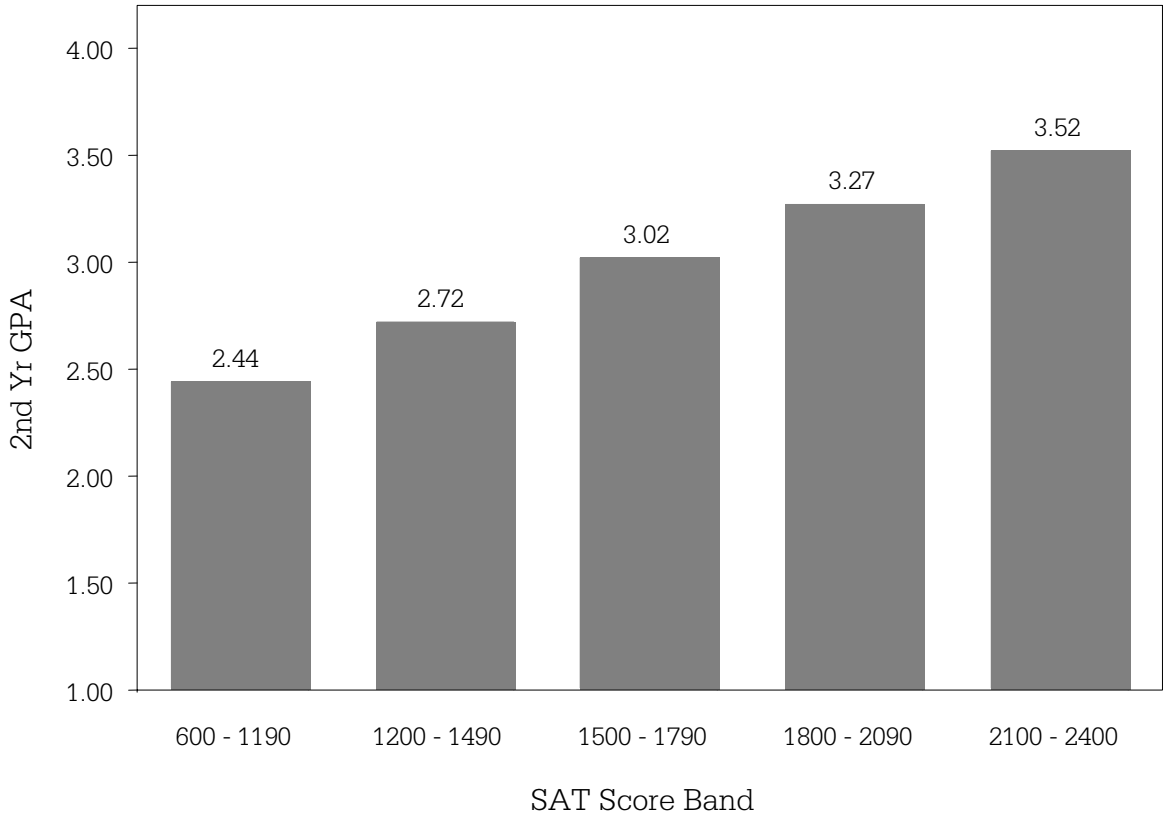
Table 14
Corrected (Raw) Correlations of Predictors with 2nd Yr GPA

Predictor(s)	Correlation
1. HSGPA	0.51 (0.32)
2. SAT-CR	0.45 (0.27)
3. SAT-M	0.44 (0.23)
4. SAT-W	0.49 (0.31)
5. SAT-M, SAT-CR	0.48 (0.29)
6. HSGPA, SAT-M, SAT-CR	0.57 (0.39)
7. SAT-CR, SAT-M, SAT-W	0.50 (0.32)
8. HSGPA, SAT-CR, SAT-M, SAT-W	0.58 (0.41)

Note. N = 75,208. Pooled within-institution, restriction of range corrected correlations are presented. The raw correlations are shown in parentheses.

- The raw and corrected correlations of SAT scores and HSGPA with 2nd Yr GPA are provided in Table 14. Similar to the results for 1st Yr GPA (Kobrin et al., 2008), both scores on the SAT and HSGPA are strong predictors of 2nd Yr GPA. In fact, the correlations with 2nd Yr GPA are only slightly lower (0.02 – 0.04 lower) than the correlations with 1st Yr GPA.
- As with 1st Yr GPA, the SAT writing section has the highest correlation with 2nd Yr GPA among the three SAT sections.
- The corrected correlation of HSGPA and 2nd Yr GPA is slightly higher (0.51) than the correlation of SAT scores and 2nd Yr GPA (0.50).
- The incremental validity of SAT scores over HSGPA for predicting 2nd Yr GPA is 0.07.

Figure 4
Mean 2nd Yr GPA by SAT Score Band

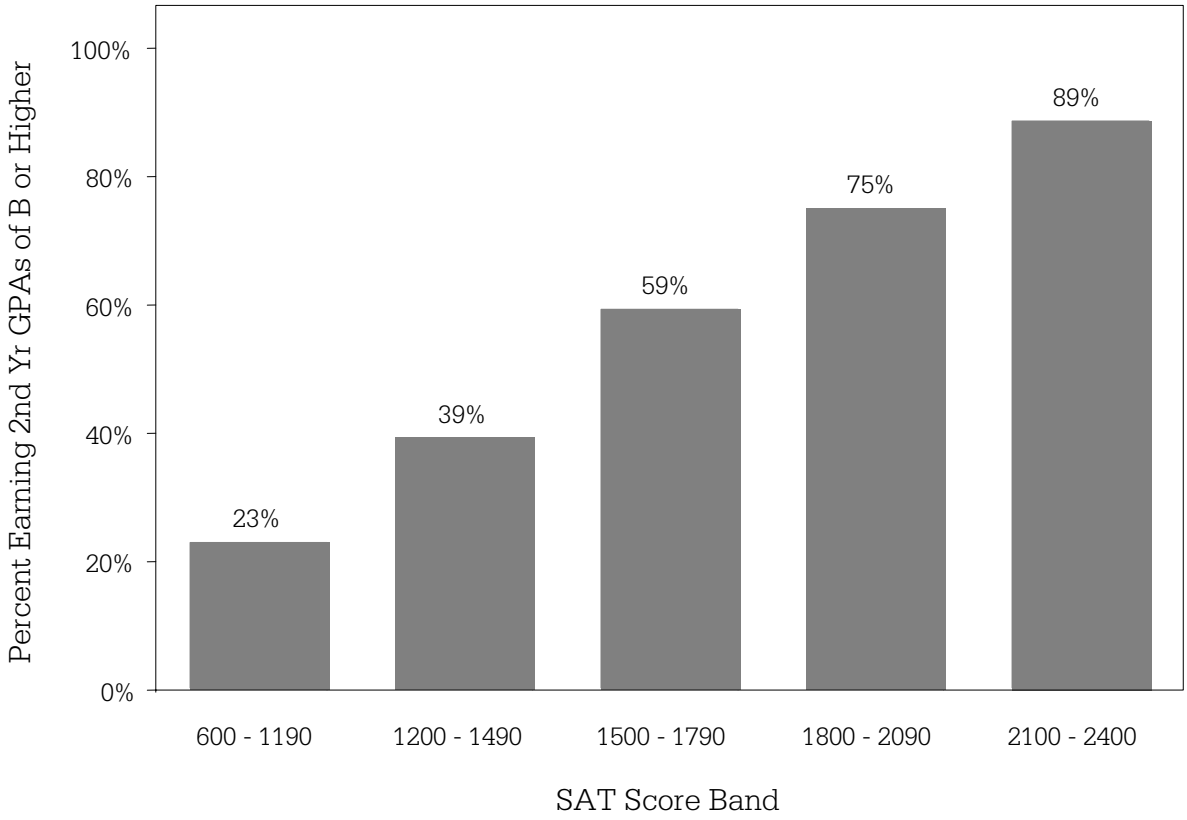


Note. SAT score bands based on the sum of SAT-CR, SAT-M, and SAT-W. The sample sizes for the five SAT score bands: 1,184 for 600-1190; 13,800 for 1200-1490; 31,486 for 1500-1790; 23,788 for 1800-2090; and 4,950 for 2100-2400.

- Figure 4 presents the mean 2nd Yr GPA of students by SAT score band. This graphically demonstrates the strong positive relationship between SAT scores and grades earned in the second year of college.

Figure 5

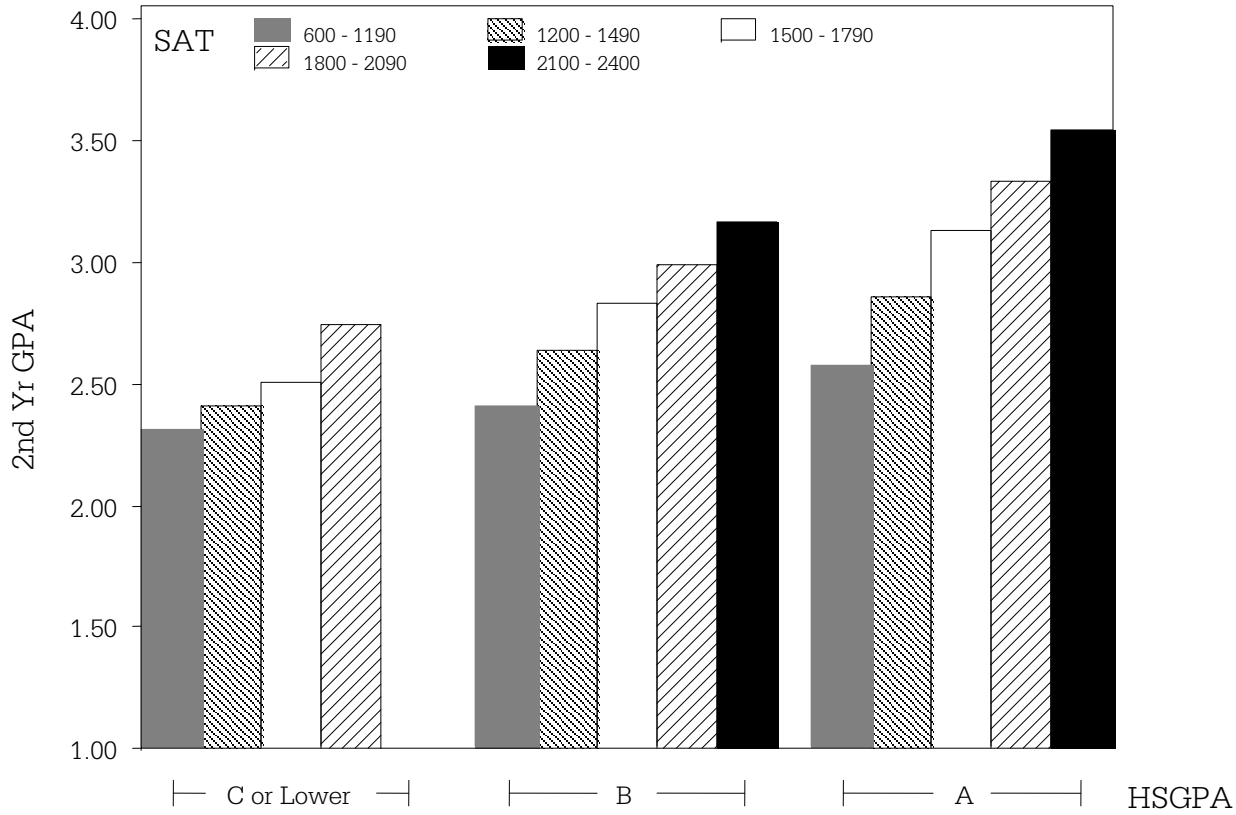
Percent of Students Earning a 2nd Yr GPA of a B or Higher by SAT Score Band



Note. SAT score bands based on the sum of SAT-CR, SAT-M, and SAT-W. Students with 2nd Yr GPAs ≥ 3.00 are considered to have earned a B or better. The sample sizes for the five SAT score bands: 1,184 for 600-1190; 13,800 for 1200-1490; 31,486 for 1500-1790; 23,788 for 1800-2090; and 4,950 for 2100-2400.

- Figure 5 presents the percent of students by SAT score band who had a 2nd Yr GPA of B (3.0) or higher, and again the strong positive relationship between SAT scores and second-year grades is evident.

Figure 6
Incremental Validity of the SAT: Mean 2nd Yr GPA by SAT Score Band Controlling for HSGPA



Note. SAT score bands based on the sum of SAT-CR, SAT-M, and SAT-W.HSGPA ranges are 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-); and "C or Lower" range: 2.33 (C+) and lower. Categories that include less than 15 students are not reported.

- Figure 6 presents students' mean 2nd Yr GPA by SAT score band, controlling for HSGPA. Figure 6 graphically displays the unique information provided by SAT, controlling for HSGPA.
- Even within HSGPA levels, there is still a strong positive relationship between SAT and 2nd Yr GPA. For example, of the students with a HSGPA equivalent to an A, those with an SAT total score between 600 to 1190 had a mean 2nd Yr GPA of 2.58 as compared to a mean 2nd Yr GPA of 3.55 for students with an SAT total score between 2100 and 2400.

Table 15

Descriptive Statistics of Study Variables by Institutional Characteristics

				SAT-CR		SAT-M		SAT-W		HSGPA		1st Yr GPA		2nd Yr GPA	
Variable		**n**	**k**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Control	Private	27,251	40	595	95	607	93	592	94	3.67	0.46	3.16	0.53	3.20	0.56
	Public	47,957	26	553	90	572	92	545	88	3.63	0.49	3.03	0.63	2.99	0.74
Selectivity	Admits under 50%	11,508	12	628	90	642	86	629	88	3.77	0.41	3.27	0.47	3.32	0.47
	Admits 50 to 75%	51,605	38	564	89	583	91	557	87	3.66	0.47	3.05	0.61	3.02	0.71
	Admits over 75%	12,095	16	529	89	539	89	520	87	3.46	0.53	3.02	0.63	3.00	0.71
Size	Small	3,295	13	551	99	555	94	548	95	3.51	0.52	3.00	0.60	3.04	0.61
	Medium	15,826	27	580	101	589	99	575	99	3.63	0.49	3.17	0.55	3.17	0.60
	Large	23,309	14	549	91	570	96	542	90	3.54	0.51	3.01	0.62	2.98	0.72
	Very large	32,778	12	577	89	596	89	571	89	3.75	0.43	3.10	0.61	3.08	0.70
Total		75,208	66	568	94	585	94	562	93	3.65	0.48	3.08	0.60	3.07	0.69

Note. k = number of institutions, n = subgroup sample size.

- Students at private institutions had higher mean SAT scores, HSGPA, 1st Yr GPA, and 2nd Yr GPA than those from public institutions.
- Students' mean SAT scores, HSGPA, 1st Yr GPA, and 2nd Yr GPA increased as institutional selectivity increased (i.e., admittance rate decreased).
- Students attending very large and medium institutions had the highest mean SAT scores, HSGPA, 1st Yr GPA, and 2nd Yr GPA compared to large and small institutions, though the differences were small.

Table 16

Corrected Correlations of SAT and HSGPA with 2nd Yr GPA by Institutional Characteristics

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Control	Private	27,251	40	0.48	0.46	0.51	0.53	0.52	0.60
	Public	47,957	26	0.44	0.43	0.47	0.49	0.50	0.57
Selectivity	Admits under 50%	11,508	12	0.49	0.46	0.53	0.54	0.51	0.60
	Admits 50 to 75%	51,605	38	0.45	0.44	0.48	0.50	0.50	0.58
	Admits over 75%	12,095	16	0.44	0.43	0.47	0.49	0.52	0.58
Size	Small	3,295	13	0.50	0.49	0.52	0.55	0.54	0.62
	Medium	15,826	27	0.49	0.47	0.52	0.54	0.53	0.61
	Large	23,309	14	0.44	0.43	0.47	0.49	0.50	0.57
	Very large	32,778	12	0.45	0.43	0.48	0.50	0.50	0.57
Total		75,208	66	0.45	0.44	0.49	0.50	0.51	0.58

Note. k = number of institutions, n = subgroup sample size. The correlations were corrected for restriction of range within institutions and pooled across institution subgroups of at least 15. Institution sizes are categorized by the number of undergraduates 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. SAT refers to the inclusion of all three sections in the relevant multiple correlation.

- The correlation of scores on each SAT section with 2nd Yr GPA was generally:
  - slightly higher in private institutions compared to public institutions;
  - higher in more selective institutions (those admitting less than half of their applicants) compared to those that admit at least half of their applicants; and
  - higher in small institutions compared to larger institutions.
- The same pattern emerges for the correlations of HSGPA with 2nd Yr GPA, albeit with smaller differences.
- Also similar to 1st Yr GPA results, the SAT is more predictive of 2nd Yr GPA than HSGPA in private institutions, institutions admitting less than half of their applicants, and small and medium institutions. The best predictor of 2nd Yr GPA is the combination of both SAT scores and HSGPA.

Table 17

Raw Correlations of SAT and HSGPA with 2nd Yr GPA by Institutional Characteristics

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Control	Private	27,251	40	0.30	0.24	0.33	0.35	0.34	0.43
	Public	47,957	26	0.25	0.22	0.29	0.31	0.32	0.40
Selectivity	Admits under 50%	11,508	12	0.31	0.23	0.35	0.37	0.32	0.43
	Admits 50 to 75%	51,605	38	0.25	0.21	0.29	0.31	0.31	0.39
	Admits over 75%	12,095	16	0.30	0.27	0.34	0.36	0.41	0.46
Size	Small	3,295	13	0.31	0.28	0.34	0.37	0.38	0.47
	Medium	15,826	27	0.29	0.24	0.32	0.35	0.34	0.43
	Large	23,309	14	0.25	0.21	0.29	0.31	0.33	0.40
	Very large	32,778	12	0.27	0.22	0.30	0.32	0.30	0.39
Total		75,208	66	0.27	0.23	0.31	0.32	0.32	0.41

Note. k = number of institutions, n = subgroup sample size. The correlations were computed within institutions and pooled across institution subgroups of at least 15. Institution sizes are categorized by the number of undergraduates 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. SAT refers to the inclusion of all three sections in the relevant multiple correlation.

- Patterns in Table 17 are the same as those in Table 16; however, correlations in this table were not corrected for restriction of range.

Table 18

Descriptive Statistics of Study Variables by Student Characteristics

Variable		n	SAT-CR Mean	SAT-CR SD	SAT-M Mean	SAT-M SD	SAT-W Mean	SAT-W SD	HSGPA Mean	HSGPA SD	1st Yr GPA Mean	1st Yr GPA SD	2nd Yr GPA Mean	2nd Yr GPA SD
Gender	Female	41,515	565	94	567	91	565	92	3.69	0.46	3.14	0.58	3.15	0.64
	Male	33,693	572	93	607	93	558	93	3.59	0.50	3.00	0.62	2.96	0.72
Race/ Ethnicity	American Indian or Alaska Native	369	555	89	564	88	540	89	3.57	0.50	2.94	0.62	2.88	0.74
	Asian, Asian-American, or Pacific Islander	7,438	571	101	626	96	569	99	3.70	0.45	3.11	0.61	3.09	0.67
	Black or African-American	4,372	511	88	509	87	503	87	3.46	0.54	2.72	0.64	2.66	0.75
	Hispanic, Latino, or Latin American	4,801	537	90	548	92	533	87	3.67	0.47	2.91	0.62	2.85	0.74
	White	52,612	574	91	588	90	567	90	3.65	0.48	3.12	0.58	3.11	0.66
	Other	2,223	566	94	578	95	562	95	3.62	0.49	3.05	0.60	3.04	0.69
	No Response	3,393	594	100	594	96	582	100	3.66	0.49	3.14	0.58	3.14	0.65
Best Language	English	70,228	570	93	585	93	564	92	3.65	0.48	3.08	0.60	3.07	0.68
	English and Another	3,515	544	99	580	105	548	100	3.67	0.47	3.01	0.61	2.96	0.70
	Another Language	716	472	98	607	110	488	102	3.68	0.48	3.14	0.58	3.09	0.66
	No Response	749	552	107	567	112	546	108	3.57	0.53	3.00	0.63	2.97	0.71
Total		75,208	568	94	585	94	562	93	3.65	0.48	3.08	0.60	3.07	0.69

Note. n = subgroup sample size.

- Males had higher SAT-CR and SAT-M scores whereas females had higher SAT-W scores, HSGPA, 1st Yr GPA, and 2nd Yr GPA.
- Asian and White students outperformed other ethnic subgroups on all of the academic indicators.
- Students whose best spoken language was a language other than English had higher SAT-M scores and lower SAT-CR and SAT-W scores relative to the other best language subgroups. Students whose best language was English and Another language had the lowest 1st Yr GPA and 2nd Yr GPA.

Table 19

Corrected Correlation of SAT Scores and HSGPA with 2nd Yr GPA by Student Subgroups

Variable		n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Gender	Female	41,515	66	0.50	0.50	0.52	0.55	0.50	0.61
	Male	33,693	64	0.43	0.43	0.45	0.48	0.48	0.55
Race/ Ethnicity	American Indian or Alaska Native	119	6	0.34	0.39	0.46	0.48	0.38	0.51
	Asian, Asian-American, or Pacific Islander	7,306	47	0.37	0.39	0.40	0.43	0.43	0.49
	Black or African-American	4,260	47	0.36	0.35	0.39	0.41	0.40	0.46
	Hispanic, Latino, or Latin American	4,684	48	0.41	0.38	0.43	0.45	0.42	0.50
	White	52,612	66	0.44	0.42	0.48	0.49	0.52	0.58
	Other	2,001	39	0.44	0.41	0.46	0.47	0.45	0.53
	No Response	3,304	54	0.43	0.37	0.46	0.47	0.46	0.54
Best Language	English	70,228	66	0.46	0.44	0.49	0.51	0.52	0.59
	English and Another	3,351	44	0.37	0.39	0.41	0.43	0.37	0.46
	Another Language	486	15	0.27	0.30	0.30	0.33	0.31	0.37
	Not Stated	428	18	0.36	0.36	0.41	0.42	0.41	0.48
Total		75,208	66	0.45	0.44	0.49	0.50	0.51	0.58

Note. k = number of institutions, n = subgroup sample size. The correlations were corrected for restriction of range within institutions and pooled across institution subgroups of at least 15.

- For females and ethnic/best language minority students, the SAT is a better predictor of 2nd Yr GPA than HSGPA alone.
- Adding SAT to HSGPA provides even greater incremental predictive validity for minority students than for white students.
- Both HSGPA and SAT scores were more predictive of 2nd Yr GPA for females than males, for White students as compared to minority students, and for students whose best language was English as compared to the other best language subgroups.

Table 20

Raw Correlation of SAT Scores and HSGPA with 2nd Yr GPA by Subgroups

	Variable	n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Gender	Female	41,515	66	0.31	0.30	0.32	0.37	0.31	0.42
	Male	33,693	64	0.23	0.23	0.27	0.30	0.31	0.38
Race/ Ethnicity	American Indian or Alaska Native	119	6	0.17	0.23	0.35	0.39	0.27	0.43
	Asian, Asian-American, or Pacific Islander	7,306	47	0.20	0.21	0.23	0.26	0.24	0.32
	Black or African-American	4,260	47	0.19	0.17	0.23	0.24	0.25	0.32
	Hispanic, Latino, or Latin American	4,684	48	0.23	0.19	0.27	0.28	0.24	0.34
	White	52,612	66	0.24	0.19	0.28	0.30	0.34	0.40
	Other	2,001	39	0.25	0.21	0.28	0.30	0.27	0.37
	No Response	3,304	54	0.29	0.18	0.33	0.34	0.31	0.41
Best Language	English	70,228	66	0.27	0.22	0.31	0.32	0.33	0.41
	English and Another	3,351	44	0.23	0.24	0.26	0.29	0.20	0.32
	Another Language	486	15	0.12	0.16	0.17	0.20	0.19	0.25
	Not Stated	428	18	0.27	0.28	0.35	0.37	0.30	0.41
Total		75,208	66	0.27	0.23	0.31	0.32	0.32	0.41

Note. k = number of institutions, n = subgroup sample size. The correlations were computed within institutions and pooled across institution subgroups of at least 15.

- Patterns in Table 20 are the same as those in Table 19; however, this table includes correlations that were not corrected for restriction of range.

Table 21

Average Over-prediction (-) and Under-prediction (+) of 2nd Yr GPA for SAT Scores and HSGPA

	Variable	n	k	SAT-CR	SAT-M	SAT-W	SAT	HSGPA	SAT & HSGPA
Gender	Female	41,515	66	0.09	0.11	0.08	0.09	0.06	0.07
	Male	33,693	64	-0.11	-0.14	-0.09	-0.11	-0.08	-0.08
Race/ Ethnicity	American Indian or Alaska Native	369	60	-0.16	-0.15	-0.14	-0.14	-0.15	-0.13
	Asian, Asian-American, or Pacific Islander	7,438	66	0.02	-0.04	0.02	0.00	0.00	0.01
	Black or African-American	4,372	63	-0.26	-0.24	-0.23	-0.20	-0.28	-0.17
	Hispanic, Latino, or Latin American	4,801	66	-0.13	-0.13	-0.12	-0.10	-0.20	-0.11
	White	52,612	66	0.03	0.04	0.03	0.03	0.04	0.02
	Other	2,223	65	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02
	No Response	3,393	66	0.00	0.03	0.01	0.01	0.04	0.01
Best Language	English	70,228	66	0.00	0.00	0.00	0.00	0.01	0.00
	English and Another	3,515	66	-0.04	-0.08	-0.05	-0.04	-0.10	-0.04
	Another Language	716	58	0.21	-0.02	0.20	0.19	0.00	0.16
	Not Stated	749	65	-0.06	-0.06	-0.05	-0.05	-0.07	-0.04
Total		75,208	66	0.00	0.00	0.00	0.00	0.00	0.00

Note. k = number of institutions, n = subgroup sample size. Negative values indicate over-prediction; positive values indicate under-prediction. 2nd Yr GPA prediction equations were estimated for each institution separately. Individual residuals were computed by subtracting predicted raw 2nd Yr GPA from actual raw 2nd Yr GPA. SAT refers to all three sections being entered as separate predictors.

- SAT scores and HSGPA both over-predicted 2nd Yr GPA for American Indian, African American and Hispanic students; however, SAT scores resulted in same or less prediction error than HSGPA for all ethnic subgroups.
- SAT scores and HSGPA over-predicted 2nd Yr GPA for males and under-predicted 2nd Yr GPA for females; however, with prediction error is slightly smaller with HSGPA.
- Relative to HSGPA, the use of SAT scores resulted in less prediction error for students who best language was English only and English and another language but greater prediction error for students whose best language is another language.

Appendix

Institutions Providing Second-Year Data on the 2006 Freshman Cohort

Institutions		
Austin College	Ohio State University	University of Puget Sound
Baldwin-Wallace College	Saint Anselm College	University of Rhode Island
Boston College	Saint Michael's College	University of Southern California
Brandeis University	Salve Regina University	University of Southern Indiana
California Lutheran University	Samford University	University of Texas, Austin
Chapman University	Schreiner University	University of the Pacific
Claremont McKenna College	Seattle University	Valdosta State University
Clemson University	Smith College	Vanderbilt University
Coastal Carolina University	Syracuse University	Washington State University, Pullman
Drew University	Temple University	Washington State University, Vancouver
Fordham University	Texas A&M University, Commerce	Western Washington University
Georgia Institute of Technology	Texas State University, San Marcos	Wheaton College
Iona College	Texas Tech University	Wilkes University
Kenyon College	Tufts University	Williams College
Keystone College	University of Cincinnati	Anonymous A
Kutztown University	University of Denver	Anonymous B
Lafayette College	University of Georgia	Anonymous C
Lasell College	University of Massachusetts, Dartmouth	Anonymous D
Loyola Marymount University	University of New Haven	Anonymous E
Lycoming College	University of North Texas	Anonymous F
Meredith College	University of Pittsburgh	Anonymous G
Millersville University of Pennsylvania	University of Portland	Anonymous H