

The Relationship Between SAT® Scores and Retention to the Fourth Year: 2006 SAT Validity Sample

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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 SAT® for use in college admission. The first sample included first-time, first-year students entering college in fall 2006, with 110 institutions providing students' first-year course work, grades, and retention to the second year. In addition to examining the predictive validity of the SAT in terms of college grades ([Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008](#); [Mattern, Patterson, Shaw, Kobrin, & Barbuti, 2008](#)), the relationship between SAT performance and retention to the second year was examined ([Mattern & Patterson, 2009](#)). The results found that higher SAT scores were associated with higher retention rates.

In the following years, participating colleges and universities were invited to provide subsequent performance data for these students in order to track them longitudinally throughout their college career. For the second year, 66 of the original 110 institutions provided data. Mattern and Patterson ([2011](#)) examined the relationship between SAT performance and retention to the third year of college. Similar to the results for second-year retention rates, higher SAT scores were associated with higher third-year retention rates.

This study builds on this body of research by examining the relationship between SAT performance and retention to the fourth year of college. The sample consisted of 59 of the original 110 institutions. Complete data (i.e., SAT scores, self-reported high school grade point average (HSGPA), retention to second-, third-, and fourth-year data) were available for 78,640 students. Results show that SAT performance was positively related to fourth-year retention rates. Detailed results are provided below. Refer to the appendix at the end of this report for a list of participating institutions.

Table 1. *Distribution of Institutional Characteristics*

Subgroup / Characteristic		%
U.S. Region	Midwest	12%
	Mid-Atlantic	20%
	New England	24%
	South	10%
	Southwest	10%
	West	24%
Control	Public	39%
	Private	61%
Size (number of undergraduates)	Small (750 to 1,999)	19%
	Medium (2,000 to 7,499)	41%
	Large (7,500 to 14,999)	24%
	Very large (15,000 or more)	17%
Selectivity	< 50%	20%
	50-75%	54%
	> 75%	25%

Note: Number of institutions = 59. Percentages may not sum to 100 because of rounding.

- The 2006 sample of institutions was diverse with regard to region, control, size, and selectivity (admittance rate).

Table 2. Returning vs. Nonreturning Students, by Student and Institutional Characteristics

Number of Students		Total	Returning	Nonreturning
		78,640	59,289	19,351
Subgroup / Characteristic		Percentage of Students		
Gender	Female	54.6	54.6	54.6
	Male	45.4	45.4	45.4
Race/ Ethnicity	American Indian	0.6	0.5	0.8
	Asian	9.9	10.6	7.7
	Black/African American	6.1	5.6	7.5
	Hispanic	6.6	6.3	7.5
	Other	3.0	3.0	3.0
	White	69.3	69.3	69.2
	No Response	4.6	4.7	4.4
Household Income	Less than \$30,000	7.5	6.9	9.5
	\$30,000–\$50,000	9.6	9.0	11.5
	\$50,000–\$70,000	11.0	10.5	12.3
	\$70,000–\$100,000	17.1	17.0	17.5
	More than \$100,000	22.7	23.8	19.5
	No Response	32.1	32.8	29.8
Highest Parental Education Level	No High School Diploma	1.8	1.6	2.2
	High School Diploma	20.4	18.3	26.8
	Associate Degree	6.5	6.0	8.3
	Bachelor's Degree	32.7	33.3	30.9
	Graduate Degree	33.7	35.8	27.1
	No Response	4.9	5.0	4.8
Control	Private	37.2	40.0	28.5
	Public	62.8	60.0	71.5
Size (number of undergraduates)	Small (750 to 1,999)	4.6	4.5	5.2
	Medium (2,000 to 7,499)	20.5	20.9	19.4
	Large (7,500 to 14,999)	36.0	34.5	40.6
	Very Large (15,000 or more)	38.8	40.1	34.9
Selectivity	< 50%	15.8	18.6	7.4
	50-75%	64.7	64.0	66.6
	> 75%	19.5	17.4	26.0
Performance Variable		Mean (SD)		
SAT-CR		563 (95)	572 (94)	537 (94)
SAT-M		579 (96)	590 (95)	548 (95)
SAT-W		556 (95)	566 (93)	527 (92)
HSGPA		3.60 (0.50)	3.65 (0.48)	3.43 (0.54)

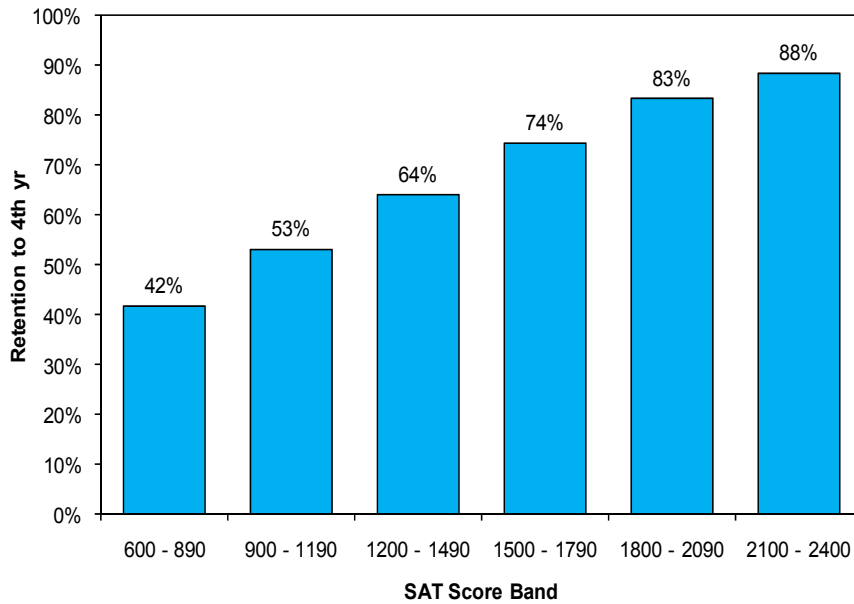
- For this sample of institutions, 86% of students returned for their second year and 79% of students returned for their third year, which matches previous findings (Mattern & Patterson, 2009, 2010). Seventy-five percent returned for their fourth year.
- The remainder of this report will focus on retention to the fourth year, so “returners” and “nonreturners” refer to the fourth year of college. Returners included students who returned for their fourth year or had graduated. Only 0.2% ($n = 155$) of the sample had graduated after three years.
 - Students from families with lower household income and parental education level made up a greater percentage of the nonreturners than of the returners.
 - As for results by institutional characteristics, 40% of returners attended a private college, compared to 28% of nonreturners. Additionally, 19% of returners attended a selective institution (i.e., an institution that admits fewer than 50% of applicants), compared to 7% of nonreturners.
 - Academic preparation (SAT scores and HSGPA) was higher for returners than for nonreturners.

Table 3. SAT Scores for Returners and Nonreturners by Student and Institutional Characteristics

Subgroup / Characteristic		Returning			Non-Returning		
		n	Mean SAT	SD	n	Mean SAT	SD
Gender	Female	32,356	1708	251	10,558	1592	247
	Male	26,933	1750	248	8,793	1634	249
Ethnicity	American Indian	292	1662	245	150	1569	204
	Asian	6,290	1776	266	1,486	1666	264
	Black/African American	3,315	1536	233	1,448	1431	231
	Hispanic	3,735	1632	238	1,454	1526	247
	Other	1,779	1714	254	587	1624	259
	White	41,116	1741	240	13,384	1629	237
	No Response	2,762	1789	264	842	1684	264
Household Income	Less than \$30,000	4,078	1595	257	1,836	1500	254
	\$30,000–\$50,000	5,341	1658	245	2,219	1558	233
	\$50,000–\$70,000	6,244	1681	237	2,379	1589	233
	\$70,000–\$100,000	10,076	1713	242	3,390	1607	232
	More than \$100,000	14,099	1786	237	3,767	1681	244
	No Response	19,451	1755	252	5,760	1632	254
Highest Parental Education Level	No High School Diploma	968	1533	251	417	1442	228
	High School Diploma	10,838	1606	232	5,182	1520	225
	Associate Degree	3,540	1631	229	1,607	1541	221
	Bachelor's Degree	19,749	1726	234	5,982	1630	234
	Graduate Degree	21,242	1815	238	5,243	1713	249
No Response	2,952	1733	271	920	1615	269	
HSGPA	≤C-	48	1466	301	72	1350	280
	C	275	1418	238	275	1386	229
	C+	679	1467	226	623	1434	222
	B-	1,999	1520	215	1,503	1480	214
	B	6,833	1580	219	3,597	1530	218
	B+	10,142	1650	228	4,033	1582	229
	A-	14,756	1732	234	4,100	1647	232
	A	16,989	1803	231	3,832	1714	242
	A+	7,568	1877	221	1,316	1801	227
Control	Private	23,702	1809	246	5,519	1710	261
	Public	35,587	1673	239	13,832	1571	232
Size (number of undergraduates)	Small (750 to 1,999)	2,654	1686	249	999	1567	232
	Medium (2,000 to 7,499)	12,368	1773	270	3,745	1639	266
	Large (7,500 to 14,999)	20,480	1673	243	7,863	1561	238
	Very Large (15,000 or more)	23,787	1755	238	6,744	1660	242
Selectivity	< 50%	11,015	1901	229	1,434	1836	252
	50–75%	37,958	1712	236	12,891	1621	235
	> 75%	10,316	1600	228	5,026	1520	235
Total		59,289	1727	251	19,351	1611	249

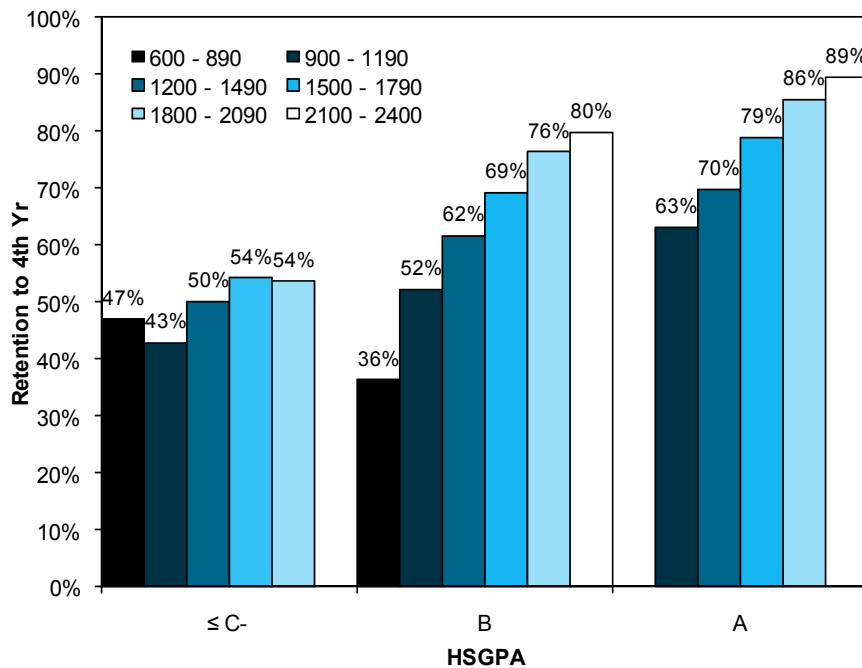
- Even after controlling for student and institutional characteristics, returners had higher SAT composite scores than nonreturners.
- This held true within each subgroup analyzed. For example, the average SAT composite score was 1595 for returning students whose parental income was less than \$30,000, compared to 1500 for nonreturners in the same category.
- In sum, the SAT performance gap between returners and nonreturners is not due to differences in the demographic makeup of the two groups.

Figure 1. Fourth-year retention rates by SAT score band



- Figure 1 presents the fourth-year retention rate by SAT score band. This graphically demonstrates the positive relationship between SAT scores and retention. That is, as SAT composite score increased, retention rates increased from a low of 42% for students with an SAT total score below 900, to a high of 88% for students with an SAT composite score of 2100 or higher.
- The sample sizes for the five SAT score bands: 55 for 600–890; 1,520 for 900–1190; 16,193 for 1200–1490; 32,435 for 1500–1790; 23,468 for 1800–2090; and 4,969 for 2100–2400.

Figure 2. Fourth-year retention rates by SAT score band, controlling for HSGPA



- Figure 2 presents students' fourth-year retention rate by SAT score band, controlling for HSGPA. Even within HSGPA levels, there is still a positive relationship between SAT scores and fourth-year retention rates. For example, of students who had an HSGPA equivalent to an A, those who had an SAT composite score between 900 and 1190 had a mean retention rate of 63%, compared to 89% for students with an SAT composite score between 2100 and 2400.
- SAT score bands are 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. Retention rates for categories containing fewer than 15 students are not reported. Sample sizes are reported below for SAT-by-HSGPA-Bands.

HSGPA	SAT Band					
	600 - 890	900 - 1190	1200 - 1490	1500 - 1790	1800 - 2090	2100 - 2400
≤ C	17	270	951	603	123	8
B	33	911	9,160	12,679	4,891	433
A	5	339	6,082	19,153	18,454	4,528

Table 4. Retention Rates by Student Demographic Characteristics

Subgroup / Characteristic	n	Retention		
		Mean	SD	
Gender	Female	42,914	0.75	0.43
	Male	35,726	0.75	0.43
Race/ Ethnicity	American Indian	442	0.66	0.47
	Asian	7,776	0.81	0.39
	Black/African American	4,763	0.70	0.46
	Hispanic	5,189	0.72	0.45
	Other	2,366	0.75	0.43
	White	54,500	0.75	0.43
	No Response	3,604	0.77	0.42
Household Income	Less than \$30,000	5,914	0.69	0.46
	\$30,000–\$50,000	7,560	0.71	0.46
	\$50,000–\$70,000	8,623	0.72	0.45
	\$70,000–\$100,000	13,466	0.75	0.43
	More than \$100,000	17,866	0.79	0.41
	No Response	25,211	0.77	0.42
Highest Parental Education Level	No High School Diploma	1,385	0.70	0.46
	High School Diploma	16,020	0.68	0.47
	Associate Degree	5,147	0.69	0.46
	Bachelor's Degree	25,731	0.77	0.42
	Graduate Degree	26,485	0.80	0.40
	No Response	3,872	0.76	0.43
Total		78,640	0.75	0.43

- Fourth-year retention rates were the same for males and females: 75%.
- As for race/ethnicity, fourth-year retention rates ranged from a high of 81% for Asian students to a low of 66% for American Indian students.
- For socioeconomic status, as household income and highest parental education increased, retention rates increased from a low of 69% to a high of 80%.

Table 5. Retention Rates (and Sample Sizes) by SAT Score Band Within Student Subgroups

Subgroup / Characteristic		SAT Score Band						
		600– 890	900– 1190	1200– 1490	1500– 1790	1800– 2090	2100– 2400	
Gender	Female	0.44 (32)	0.53 (938)	0.65 (9,791)	0.75 (17,898)	0.84 (11,837)	0.88 (2,418)	
	Male	0.39 (23)	0.54 (582)	0.63 (6,402)	0.74 (14,537)	0.83 (11,631)	0.88 (2,551)	
Race / Ethnicity	American Indian	n/r (0)	n/r (12)	0.58 (116)	0.62 (205)	0.81 (95)	n/r (14)	
	Asian	n/r (4)	0.62 (118)	0.72 (1,325)	0.79 (2,763)	0.85 (2,722)	0.90 (844)	
	Black/African American	0.36 (22)	0.52 (390)	0.63 (1,975)	0.77 (1,821)	0.83 (532)	0.74 (23)	
	Hispanic	n/r (9)	0.46 (219)	0.64 (1,550)	0.75 (2,226)	0.82 (1,078)	0.83 (107)	
	Other	n/r (5)	0.53 (60)	0.67 (475)	0.75 (971)	0.82 (718)	0.84 (137)	
	White	n/r (12)	0.53 (662)	0.63 (10,191)	0.74 (23,210)	0.83 (16,966)	0.89 (3,459)	
	No Response	n/r (3)	0.68 (59)	0.64 (561)	0.74 (1,239)	0.82 (1,357)	0.87 (385)	
	Parental Income	Less than \$30,000	0.47 (15)	0.51 (391)	0.62 (2,038)	0.73 (2,353)	0.78 (958)	0.84 (159)
		\$30,000–50,000	n/r (8)	0.52 (227)	0.63 (2,103)	0.71 (3,325)	0.81 (1,636)	0.87 (261)
\$50,000–70,000		n/r (3)	0.55 (152)	0.63 (2,132)	0.73 (3,892)	0.81 (2,115)	0.86 (329)	
\$70,000–100,000		n/r (1)	0.55 (214)	0.64 (2,898)	0.74 (5,921)	0.83 (3,714)	0.88 (718)	
More than \$100,000		n/r (6)	0.55 (130)	0.66 (2,470)	0.77 (7,042)	0.84 (6,665)	0.89 (1,553)	
No Response		0.41 (22)	0.53 (406)	0.65 (4,552)	0.76 (9,902)	0.84 (8,380)	0.89 (1,949)	

Note: Categories with fewer than 15 students are not reported as by indicated by “n/r”.

Table 5 (continued)

		SAT Score Band					
		600– 890	900– 1190	1200– 1490	1500– 1790	1800– 2090	2100– 2400
Highest Parental Education	No High School Diploma	n/r (5)	0.55 (124)	0.66 (573)	0.73 (515)	0.81 (145)	0.91 (23)
	High School Diploma	0.48 (23)	0.47 (630)	0.61 (5,421)	0.70 (6,986)	0.79 (2,701)	0.86 (259)
	Associate Degree	n/r (4)	0.48 (152)	0.61 (1,586)	0.70 (2,354)	0.81 (956)	0.86 (95)
	Bachelor's Degree	n/r (7)	0.59 (334)	0.66 (4,772)	0.76 (11,530)	0.84 (7,759)	0.88 (1,329)
	Graduate Degree	n/r (8)	0.60 (173)	0.67 (3,044)	0.78 (9,627)	0.84 (10,678)	0.89 (2,955)
	No Response	n/r (8)	0.62 (107)	0.66 (797)	0.75 (1,423)	0.83 (1,229)	0.89 (308)
HSGPA	≤ C-	n/r (4)	0.30 (27)	0.42 (48)	0.43 (30)	n/r (9)	n/r (2)
	C	n/r (6)	0.46 (94)	0.49 (275)	0.52 (141)	0.56 (34)	n/r (0)
	C+	n/r (7)	0.44 (149)	0.51 (628)	0.56 (432)	0.54 (80)	n/r (6)
	B-	n/r (10)	0.48 (229)	0.54 (1,505)	0.59 (1,445)	0.66 (303)	n/r (10)
	B	0.39 (18)	0.51 (365)	0.62 (3,808)	0.67 (4,693)	0.73 (1,454)	0.77 (92)
	B+	n/r (5)	0.57 (317)	0.64 (3,847)	0.73 (6,541)	0.79 (3,134)	0.81 (331)
	A-	n/r (2)	0.60 (189)	0.69 (3,346)	0.77 (8,338)	0.84 (5,936)	0.88 (1,045)
	A	n/r (3)	0.67 (135)	0.70 (2,252)	0.80 (8,057)	0.85 (8,352)	0.89 (2,022)
	A+	n/r (0)	0.73 (15)	0.75 (484)	0.81 (2,758)	0.87 (4,166)	0.91 (1,461)
Total		0.42 (1,520)	0.53 (16,193)	0.64 (32,435)	0.74 (23,468)	0.83 (4,969)	0.88 (4,969)

Note: Categories with fewer than 15 students are not reported as by indicated by "n/r".

- Differences in retention rates by student subgroups were reduced when controlling for SAT performance, especially for higher SAT score bands.

Table 6. Retention Rates by Institutional Characteristics

Subgroup / Characteristic	n	Retention		
		Mean	SD	
Control	Private	29,221	0.81	0.39
	Public	49,419	0.72	0.45
Size (number of undergraduates)	Small (750 to 1,999)	3,653	0.73	0.45
	Medium (2,000 to 7,499)	16,113	0.77	0.42
	Large (7,500 to 14,999)	28,343	0.72	0.45
	Very Large (15,000 or more)	30,531	0.78	0.41
Admittance Rate	< 50%	12,449	0.88	0.32
	50–75%	50,849	0.75	0.44
	> 75%	15,342	0.67	0.47
Total	78,640	0.75	0.43	

- Students at private institutions were more likely to return for their fourth year (81%) than students at public institutions (72%).
- As for institution size, retention was the highest for students at very large institutions (78%), followed by medium institutions (77%). Fourth-year retention rates at small and large institutions were 73% and 72%, respectively.
- For institutional selectivity, institutions that admit fewer than 50% of applicants had the highest retention rate (88%), whereas institutions that admit more than 75% of applicants had the lowest retention rate (67%).

Table 7. Retention Rates (and sample sizes) by SAT Score Band Within Institutional Subgroups

Subgroup / Characteristic	SAT Score Band						
	600– 890	900– 1190	1200– 1490	1500– 1790	1800– 2090	2100– 2400	
Control	Private	n/r (12)	0.65 (317)	0.69 (3,548)	0.79 (10,249)	0.85 (11,819)	0.88 (3,276)
	Public	0.35 (43)	0.50 (1,203)	0.63 (12,645)	0.72 (22,186)	0.82 (11,649)	0.88 (1,693)
Size (number of undergraduates)	Small (750 to 1,999)	n/r (1)	0.57 (86)	0.61 (951)	0.73 (1,575)	0.82 (865)	0.91 (175)
	Medium (2,000 to 7,499)	n/r (10)	0.59 (275)	0.64 (3,025)	0.74 (5,694)	0.84 (5,348)	0.89 (1,761)
	Large (7,500 to 14,999)	0.31 (29)	0.50 (808)	0.63 (7,436)	0.73 (12,215)	0.82 (6,937)	0.88 (918)
	Very Large (15,000 or more)	0.47 (15)	0.55 (351)	0.67 (4,781)	0.76 (12,951)	0.84 (10,318)	0.88 (2,115)
Admittance Rate	< 50%	n/r (3)	0.85 (71)	0.80 (645)	0.86 (3,081)	0.90 (6,170)	0.91 (2,479)
	50–75%	0.58 (19)	0.56 (741)	0.64 (10,534)	0.74 (22,450)	0.82 (14,819)	0.86 (2,286)
	> 75%	0.30 (33)	0.47 (708)	0.61 (5,014)	0.70 (6,904)	0.76 (2,479)	0.79 (204)
Total	0.42 (1,520)	0.53 (16,193)	0.64 (32,435)	0.74 (23,468)	0.83 (4,969)	0.88 (4,969)	

Note: Categories with fewer than 15 students are not reported as by indicated by “n/r”.

- Differences in retention rates by institutional subgroups were reduced and in some instances eliminated when controlling for SAT performance, especially for higher SAT score bands.

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Appendix. Institutions Providing Retention to the Fourth Year Data for the 2006 SAT Validity Sample

Albany College of Pharmacy and Health Sciences	Texas A&M University, Commerce
Austin College	Texas State University, San Marcos
Baldwin-Wallace College	Tufts University
Boston College	University of Cincinnati
Boston University	University of Denver
Brandeis University	University of Massachusetts, Dartmouth
Chapman University	University of New Haven
Claremont McKenna College	University of North Texas
Clemson University	University of Oregon
Coastal Carolina University	University of Pittsburgh
Drew University	University of Portland
Eastern Connecticut State University	University of Rhode Island
Fordham University	University of Southern California
Georgia Institute of Technology	University of Southern Indiana
Iona College	University of Texas, Austin
Kenyon College	University of the Pacific
Kutztown University of Pennsylvania	Valdosta State University
Lafayette College	Vanderbilt University
Lasell College	Washington State University, Pullman
Lycoming College	Washington State University, Vancouver
Meredith College	Western Washington University
Ohio State University, Columbus	Wheaton College
Saint Anselm College	Wilkes University
Saint Michael's College	Williams College
Salve Regina University	Anonymous A
Schreiner University	Anonymous B
Seattle University	Anonymous C
Smith College	Anonymous D
Syracuse University	Anonymous E
Temple University	
