Research Notes

Score Change When Retaking the SAT® I: Reasoning Test

Each year over one million high school students complete the SAT® I. These students constitute approximately two-thirds of all first-year, full-time entering college students. Approximately 50 percent of these high school students take the SAT I more than once. Some take it five times during their high school careers.

Information on repeat testing and the probability that a student's SAT I score will change may help students and educators make better-informed decisions about retesting. This information would also be useful for high school counselors who advise students regarding testing, and for college admission officers and faculty who use SAT I scores for admission and placement decisions. Recent analyses have shown that student performance on repeat testing (i.e., taking the SAT I more than once) is influenced by a number of factors. It is important to consider the semester (fall or spring) and year (junior or senior) of the initial testing, the score of the initial testing, and the length of time between testings, all factors that affect whether, and by how much, scores will change. Also of interest is the average degree of score change students can expect between taking the PSAT/NMSQT and the SAT I.

The PSAT/NMSQT measures developed verbal reasoning, quantitative reasoning, and developed writing skills related to academic success in college. The PSAT/NMSQT is administered to over two million students each October, the majority of which are high school sophomores and juniors. Students take the PSAT/NMSQT for a variety of reasons. The PSAT/NMSQT yields information that can be used by high school counselors to assist high school students in course selection, college planning, and scholarship awards. Unlike the SAT I, which is used to apply to colleges, the PSAT/NMSQT is generally taken by students in preparation for the SAT I.

The first part of this report concerns only score changes between consecutive testings of the SAT I. In the second half, average scores between PSAT/NMSQT and SAT I will be described.[1]

SAT I SCORE CHANGES

Using the Tables

The tables that correspond to the first part of this report provide information regarding the proportion of students attaining a range of scores on the initial testing of the SAT I and their scores on each subsequent test taken (up to five times). The data in these analyses:

- Include 1,120,563[2] students from the 1997 college-bound seniors who took the SAT I between the period of October 1995 to June 1996, considered the junior year for the cohort, and the period between October 1996 to June 1997, considered the senior year.

- Indicate that students with lower initial scores tend either to take the SAT I only once or more than three times. Mean scores for each subsequent testing show an increase of 7 to 13 points on the verbal scale and 8 to 16 points on the math scale. Overall, score gains between the earlier testings (e.g., between the first and second testings) are higher than changes between the later testings (e.g., between the fourth and fifth testings) in math.

- Reveal that students completing the SAT I in the fall of the junior and senior year typically have larger score gains than students completing the test in the fall and spring of the junior year. This effect may be explained partially because the longer interval between testing may result in increased experience

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and completion of more rigorous academic courses in high school. Also, the change in scores between the fall and spring testing for juniors tends to be larger than the change in scores between the junior spring and senior fall testings.

Who Takes the SAT I, and When?

Table 1 summarizes the numbers and percentages, for the total group and by gender, of college-bound seniors in 1997 who took the SAT I in their junior and senior years from one to five times. The majority of students (51 percent) take the SAT I only once. The repeater pattern (the semester and year students are most likely to take and then repeat the SAT I) is also shown in the Appendix. For those students who take the test only one time, one-half generally take the test in their junior year and one-half in their senior year. The second most frequent trend (38 percent), is to take the SAT I twice, in the junior and/or senior years. For those students who take the SAT I twice, most take the test once in each of their junior and senior years (79 percent). Three-time test takers are more rare. Only 10 percent of the sample in the current study took the test three times and less than 2 percent of students complete the SAT I more than three times. Females are more likely to retake the SAT than males (51 percent versus 47 percent).

Tables 2 to 4 summarize the scores of students who took the test from one to five times for the total group and by gender. Students completing the SAT I only once have lower initial scores than students completing the test two or three times. The 48 percent of students completing the SAT I two or three times generally have higher initial scores. About one percent of students completing the SAT I four or more times have the lowest initial scores. On the verbal test, these students start with a lower score, on average, and although their scores do increase somewhat each time they take the test, their final testing score is still typically lower than the initial score of students who take the SAT I less often. For math, students who take the test three times do better, on average, in the third testing than other students on their final testing.

Tables 3 and 4 illustrate some gender differences with repeat testing for SAT I math. Males who complete the SAT I on two or three occasions gain an average of 18 and 31 points, respectively, from initial score to final score. Females gain an average of 14 and 25 points from initial to final testing. Because nearly one-half of all students complete the SAT I on two or three occasions, some of this differential score change may be relevant to findings concerning gender differences on the SAT I. On the verbal scale there is both slightly less overall growth in scores with repeat testing and no significant gender differences in score changes. A greater number and proportion of females retake the SAT I than males; these and other differences between students who retest may account for some of these small differences.

	Total		Males		Females	
Number of Tests	**n**	**percent**	**n**	**percent**	**n**	**percent**
One	567,495	51	272,608	53	294,887	49
Two	426,569	38	188,297	36	238,272	40
Three	107,870	10	47,278	09	60,592	10
Four	15,633	01	7,316	01	8,317	01
Five	2,417	00	1,275	00	1,142	00
Total	1,119,984		516,774		603,210	

TABLE 1

NUMBERS AND PERCENTS OF STUDENTS WHO TOOK THE SAT I FROM ONE TO FIVE TIMES AS JUNIORS AND SENIORS

TABLE 2

MEAN SCORES (SD) FOR TEST TAKERS WHO TOOK THE SAT I FROM ONE TIME TO FIVE TIMES DURING THEIR JUNIOR AND SENIOR YEARS (TOTAL)

	Number of Tests	1st Time	2nd Time	3rd Time	4th Time	5th Time
Verbal	One	492 (117)				
	Two	507 (102)	520 (104)			
	Three	493 (97)	504 (97)	515 (99)		
	Four	468 (96)	480 (97)	488 (98)	499 (100)	
	Five	442 (97)	453 (99)	460 (98)	469 (98)	480 (100)
Math	One	492 (116)				
	Two	512 (103)	528 (106)			
	Three	510 (99)	525 (101)	537 (102)		
	Four	495 (101)	511 (101)	522 (103)	532 (104)	
	Five	481 (105)	496 (107)	507 (108)	518 (107)	526 (109)

Source: Lyu and Lawrence (1998).

TABLE 3

MEAN SCORES (SD) FOR TEST TAKERS WHO TOOK THE SAT I FROM ONE TIME TO FIVE TIMES DURING THEIR JUNIOR AND SENIOR YEARS (MALES)

	Number of Tests	1st Time	2nd Time	3rd Time	4th Time	5th Time
Verbal	One	497 (117)				
	Two	507 (103)	521 (104)			
	Three	491 (99)	501 (99)	514 (101)		
	Four	464 (99)	475 (101)	483 (100)	496 (103)	
	Five	433 (97)	445 (100)	450 (98)	461 (97)	473 (100)
Math	One	513 (117)				
	Two	529 (105)	547 (108)			
	Three	524 (103)	542 (104)	555 (105)		
	Four	503 (107)	520 (107)	532 (109)	542 (109)	
	Five	485 (110)	501 (112)	513 (114)	527 (111)	533 (113)

Source: Lyu and Lawrence (1998).

TABLE 4

MEAN SCORES (SD) FOR TEST TAKERS WHO TOOK THE SAT I FROM ONE TIME TO FIVE TIMES DURING THEIR JUNIOR AND SENIOR YEARS (FEMALES)

	Number of Tests	1st Time	2nd Time	3rd Time	4th Time	5th Time
Verbal	One	487 (116)				
	Two	506 (102)	520 (104)			
	Three	494 (95)	506 (95)	516 (98)		
	Four	472 (94)	484 (94)	492 (96)	501 (98)	
	Five	452 (96)	461 (96)	470 (97)	478 (98)	487 (100)
Math	One	474 (111)				
	Two	498 (99)	512 (102)			
	Three	498 (95)	512 (96)	523 (98)		
	Four	488 (96)	503 (96)	513 (97)	523 (99)	
	Five	475 (99)	489 (101)	500 (101)	509 (101)	519 (103)

Source: Lyu and Lawrence (1998).

TABLE 5

EFFECTS OF REPEATING THE SAT I BASED ON INITIAL SCORE

VERBAL — PERCENTAGE OF STUDENTS WITH SENIOR YEAR SCORE GAIN OR LOSS

Junior Year Scores	-140 & below	-110 to -130	-80 to -100	-50 to -70	-20 to -40	-10 to +10	+20 to +40	+50 to +70	+80 to +100	+110 to +130	+140 & above	Average of Senior Year Scores
680-720		1	4	12	21	24	21	10	5	2		696
630-670			3	10	22	26	20	12	4	1	1	651
580-620			2	9	20	28	23	12	4	1		605
530-570			2	8	19	28	24	13	4	1		557
480-520		1	2	7	17	27	26	14	5	1		509
430-470		1	2	7	16	25	25	15	6	2		464
380-420		1	2	6	13	22	25	18	9	3	1	422
330-370		1	2	4	10	18	24	21	12	5	2	384
280-320		1	2	4	6	13	20	23	17	9	5	350

MATH — PERCENTAGE OF STUDENTS WITH SENIOR YEAR SCORE GAIN OR LOSS

Junior Year Scores	-140 & below	-110 to -130	-80 to -100	-50 to -70	-20 to -40	-10 to +10	+20 to +40	+50 to +70	+80 to +100	+110 to +130	+140 & above	Average of Senior Year Scores
680-720			3	10	20	29	22	9	6	1		700
630-670			2	7	19	26	24	14	5	1		657
580-620			2	7	18	27	26	14	5	1		610
530-570			1	6	17	27	26	16	6	2		563
480-520			1	6	16	27	26	16	6	2		515
430-470			2	5	15	25	27	17	7	2	1	469
380-420		1	2	6	14	23	26	18	8	2	1	422
330-370	1	1	2	5	11	19	24	21	11	4	2	379
280-320		1	2	4	8	13	20	22	17	9	4	349

How to Use this Table
•The left-hand column of each table groups test-taking juniors by score ranges.
•The columns to the immediate right show the percentage of these students who gained or lost a given range of points when they tested again as seniors.
•The column at the far right gives a senior-year mean for each original group of juniors.
Points to Note
•Overall, 55 percent of juniors taking the test improved their scores as seniors, 35 percent had score decreases, and 10 percent had no change.
•The higher a student's scores as a junior, the more likely that subsequent scores will be lower. The lower the initial scores, the more likely subsequent scores will be higher.

•On average, juniors repeating the SAT I as seniors improved their verbal scores by about 12 points and their math scores by about 16 points.
•Among students repeating the SAT I, about 1 in 25 gains 100 or more points on verbal or math, and about 1 in 100 loses 100 or more points.
Technical Data
•Data are based on about 419,000 students who took the SAT I in the spring of 1996 as juniors and in the fall of 1996 as seniors.
•Scores are shown on the recentered scale.

Source: *Handbook for the SAT Program 1997-98.* (College Board, 1997).

Another way to evaluate the probability that a student's score is likely to change with repeat testing is to examine score change given a particular score on the initial SAT I. Table 5 illustrates the percent of students with score changes from their junior to senior year based on their initial SAT I score (junior-year testing). Overall, 55 percent of juniors taking the test improved their scores as seniors, 35 percent had score decreases, and 10 percent had no change. The higher the student's initial SAT I score as a junior, the more likely subsequent scores will be lower or have a smaller increase. Similarly, the lower a student's initial score as a junior the more likely a subsequent score will be higher with repeat testing (College Board, 1997). Of those students completing the SAT I as juniors and again as seniors, 1 in 25 had score increases of 100 or more points in verbal or math, with 1 in 100 experiencing a loss of 100 or more points in verbal or math.

Average Score Changes and Junior and Senior Sequences

The most popular trend is for students to take the SAT I in the spring of their junior year and in the fall of their senior year. Table 6 demonstrates other patterns of test taking. Many people may question whether the length of time between testings affects a student's score improvement, and if so, by what magnitude. In general, students who take the SAT I in the fall of their junior year and then again in the fall of their senior year exhibit the most improvement. In the current sample, the average score changes were 19 points and 21 points for the verbal and math domains, respectively. Many factors may contribute to this phenomenon. For instance, these students have a greater amount of time between testings than if they were to take the test twice within the same school year, allowing more time for studying and simple maturational growth. In addition, these students, nearing the time they are applying and deciding where to at-

TABLE 6				
AVERAGE SCORE CHANGE FOR JUNIOR FALL, JUNIOR SPRING, AND SENIOR FALL TESTINGS (TOTAL)				
Group	**N**	**Junior Fall Mean (SD)**	**Junior Spring Mean (SD)**	**Senior Fall Mean (SD)**
Verbal				
Students with junior fall and junior spring, but not senior fall testings	23,006	546 (103)	563 (106) *change = 18*	
Students with junior spring and senior fall, but not junior fall testings	381,790		505 (99)	517 (100) *change = 13*
Students with junior fall and senior fall, but not junior spring testings	33,132	512 (108)		532 (110) *change = 19*
Students with junior fall, junior spring, and senior fall testings	37,685	509 (94)	522 (95) *change = 14*	532 (97) *change = 10**
Students with at least junior spring and senior fall testings	419,475		506 (98)	519 (100) *change = 12*
Math				
Students with junior fall and junior spring, but not senior fall testings	23,006	558 (104)	579 (104) *change = 21*	
Students with junior spring and senior fall, but not junior fall testings	381,790		511 (98)	527 (102) *change = 16*
Students with junior fall and senior fall, but not junior spring testings	33,132	523 (110)		544 (111) *change = 21*
Students with junior fall, junior spring, and senior fall testings	37,685	526 (98)	544 (96) *change = 18*	557 (100) *change = 13**
Students with at least junior spring and senior fall testings	419,475		514 (99)	530 (102) *change = 16*

* Average score change from junior spring to senior fall testing.

tend college, may approach the test with a different level of seriousness and intensity as opposed to when they were juniors.

Additional trends regarding length of time between testings are noteworthy. Score changes between the fall and the spring scores for juniors are, on average, larger than the changes between the junior spring and senior fall scores. In the current sample, students with junior fall and junior spring testings, but not senior fall, earned an average of 18 points on the verbal scale, whereas students with junior spring and senior fall testings earned an average of 13 points. Students who saw the least score change between testings were those who took the test in the fall and spring of their junior year, and then again in the fall of their senior year. Although their scores increased, on average, by 14 points on the verbal scale and 18 points on the math scale between fall and spring of their junior year, their scores increased by only 10 and 13 points between their junior spring and senior fall testings on the verbal and math scales, respectively. Finally, students who chose to take the SAT I more frequently may differ in meaningful ways from students taking the test once or twice. Students who first take the SAT I in their sophomore or junior year also may differ from students who complete the SAT I for the first time in their senior year. Such differences in student samples can affect the generalizability of these data. The magnitude of change students can expect depends on many factors, including their initial SAT I scores (students with higher initial scores are less likely to have large increases with repeat testing than students with lower initial scores), length of time between testings, maturation, and ability.

Interpreting Score Changes for Individual Students

It is often difficult to interpret multiple scores from the same test when they differ substantially. There are a number of different measures used to estimate meaningful changes for individual student scores. First, a test's reliability coefficient is helpful for determining the extent to which a student would consistently earn similar scores upon repeated testing. A reliability of 1.00 would indicate perfect reliability. The SAT I has a reliability of .91-.93 for the verbal scale and .91-.94 for the math scale. Second, a student's performance on a test, in a course, or in an event is likely to differ somewhat if he or she completed the test, course, or event a second time. Normal variations in conditions, content, and among students account for these differences. The standard error of measurement is an index of the extent of variation that can be expected for the test and is used to generate score ranges reflecting a student's true score (or an average value where the student's scores would cluster). The lower the standard error the better. The standard errors of measurement for the verbal and math scales are 30-32 points and 29-32 points, respectively. Finally, the standard error of the difference for a test is computed and multiplied by 1.5 to provide an estimate of how much two scores must differ before they can indicate different levels of ability or achievement on a test, either between two students or between repeat testing for the same student. The standard error of the difference on the SAT I is 42-46 points on the verbal scale and 41-45 points on the math scale. Therefore, scores must differ by approximately 60 points in order to indicate true differences in ability. However, that does not mean that smaller differences in test performance are meaningless. Across groups of students, higher scores, on average, will indicate higher levels of ability or achievement, even when scores differ by only a few points.

PSAT/NMSQT TO SAT I SCORE CHANGES[3]

Using the Tables

Tables 7-11 provide information regarding the proportion of students attaining a range of scores on the initial testing of the PSAT/NMSQT, and their scores on each subsequent SAT I taken. Information includes patterns of score changes between these two tests. The data in these analyses:

- Include juniors who took the PSAT/NMSQT in 1994 and took the SAT I at various times throughout their spring 1995 junior year and fall 1995 senior year. Table 7 reports the breakdown of the numbers of students in each category.
- Exclude students who took the SAT I prior to April 1995 and students who did not have both SAT I math and verbal scores.

TABLE 7
DESCRIPTIVE STATISTICS FOR PSAT/NMSQT AND SAT I TEST TAKERS

Groups	Tests	Grade Levels	N
Students with 1994 PSAT/NMSQT and first time spring 1995 SAT I testings	PSAT/NMSQT 1994 SAT I Spring 1995	Juniors Juniors	450,309
Students with 1994 PSAT/NMSQT and fall 1995 SAT I testings	PSAT/NMSQT 1994 SAT I Fall 1995	Juniors Seniors	370,794
Students with 1994 PSAT/NMSQT, 1995 spring SAT I, and 1995 fall SAT I testings	PSAT/NMSQT 1994 SAT I Spring 1995 SAT I Fall 1995	Juniors Juniors Seniors	259,492
Students with 1994 PSAT/NMSQT and November 1995 SAT I testings	PSAT/NMSQT 1994 SAT I Nov 1995	Juniors Seniors	142,530
Students with 1995 PSAT/NMSQT and November 1995 SAT I testings (one month later)	PSAT/NMSQT 1995 SAT I Nov 1995	Juniors Juniors	10,941

- Include PSAT/NMSQT scores that are reported on a 20-80 scale and SAT I scores that are reported on a 200-800 scale. Throughout this section, all score changes are reported on the PSAT/NMSQT scale only.
- Demonstrate that students who take the PSAT/NMSQT in their junior year and the SAT I subsequently in their senior year are likely to see greater gains in their scores than junior-year PSAT/NMSQT test takers who take the SAT I later in their junior year. In addition, low scoring PSAT/NMSQT takers are likely to see greater gains in their SAT I scores than PSAT/NMSQT takers who score in the middle or upper range.

Junior-Year PSAT/NMSQT to Junior-Year SAT I

Table 8 reports data for students who took the PSAT/NMSQT as juniors in 1994 and took the SAT I for the first time in the spring of 1995, for the total group and by gender and ethnicity. Consistent with data from the SAT I, Table 8 reveals that, on average, the gains on the verbal test are slightly lower than the gains on the math test, for both genders. Male students improve slightly more than female students on the verbal test, while a slight advantage in score change for females on math is of no practical significance. Table 8 also provides data on score changes by ethnicity.[4]

Table 9 reports the average SAT I scores given a particular PSAT/NMSQT score. On average, students who score a 70 on the junior-year PSAT/NMSQT can expect to score lower than 70 on the SAT I test. Students, at each level, tend to see higher score gains on the math test than the verbal test. Based on the tables, juniors who obtain a score of 20 on the PSAT/NMSQT can expect to see the largest gain in their scores. This is true across all gender and ethnic groups.[5]

Junior-Year PSAT/NMSQT to Senior-Year SAT I

Similar to data presented above, this section examines those students who took the PSAT/NMSQT as juniors in the fall of 1994 and took the SAT I for the first time in the spring of 1995. Therefore, their fall 1995 senior scores may or may not be their first time SAT I scores. According to Table 10, the average gain on the verbal test and math test on the PSAT/NMSQT scale is 1.8 points and 2.9 points, respectively. Comparing these score changes to changes from the junior-year PSAT/NMSQT to the junior-year SAT I in Table 8, the gains in the former category are larger. Regarding gender differences, males again tend to attain larger score improvements than females on the verbal scale with no practical difference found on the math scale.

Table 11 reports the average SAT I score taken in the senior year, given a particular junior-year PSAT/NMSQT score. Generally, juniors who took the PSAT/NMSQT in their junior year and took the SAT I in their senior year had larger gains than students who took one SAT I in their junior year. As

TABLE 8
DESCRIPTIVE STATISTICS AND AVERAGE SCORE CHANGES FOR STUDENTS WHO TOOK THE PSAT/NMSQT AS JUNIORS IN 1994 AND THE SAT I AS JUNIORS IN THE SPRING OF 1995

	N*	PSAT/NMSQT (1994) Mean	SD	Junior SAT I (1995) Mean	SD	Score Change**
Verbal						
Total	450,309	51.7	9.9	525	101	0.8
Gender Groups						
Male	200,580	51.8	10.1	528	103	1.1
Female	249,541	51.6	9.8	523	100	0.7
Ethnic Groups						
Native American	1,750	50.7	9.9	516	101	0.9
African American	28,600	45.8	9.6	463	98	0.5
Asian American	35,022	50.6	11.3	513	114	0.7
Hispanic American	26,365	48.2	9.7	486	99	0.4
White	342,826	52.6	9.6	535	97	0.9
Math						
Total	450,309	50.7	10.3	528	103	2.1
Gender Groups						
Male	200,580	52.9	10.7	548	105	1.9
Female	249,541	49.0	9.7	511	98	2.2
Ethnic Groups						
Native American	1,750	49.1	10.0	510	96	1.9
African American	28,600	43.1	9.0	449	93	1.8
Asian American	35,002	54.4	11.0	567	108	2.3
Hispanic American	26,365	46.6	9.7	485	98	1.9
White	342,826	51.3	10.0	534	99	2.1

*Totals include students who did not indicate gender or ethnicity.
**Score changes are on the PSAT/NMSQT scale and based on calculations of unrounded means.
Source: Lyu, Gilsdorf, and Schmitt (1996).

TABLE 9
SCORE CHANGES AT PARTICULAR SCORE LEVELS FOR STUDENTS WHO TOOK THE PSAT/NMSQT AS JUNIORS IN 1994 AND THE SAT I AS JUNIORS IN THE SPRING OF 1995

Junior PSAT/NMSQT Score Levels	Junior SAT I N	Mean	SD	Score Change*
Verbal				
70	3,034	689	49	-1.1
60	13,739	602	46	0.2
50	15,465	507	48	0.7
40	8,480	416	53	1.6
30	1,778	348	62	4.8
20	1,128	307	64	10.7
Math				
70	2,223	697	48	-0.3
60	10,934	612	47	1.2
50	15,470	521	48	2.1
40	14,359	431	48	3.1
30	2,434	351	57	5.1
20	276	310	61	11.0

*Score changes are on the PSAT/NMSQT scale.
Source: Lyu, Gilsdorf, and Schmitt (1996).

TABLE 10

**DESCRIPTIVE STATISTICS AND SCORE CHANGES FOR STUDENTS WHO TOOK
THE PSAT/NMSQT AS JUNIORS IN 1994 AND THE SAT I AS SENIORS IN THE FALL OF 1995**

| | N* | PSAT/NMSQT (1994) | | Senior SAT I (1995) | | Score |
		Mean	SD	Mean	SD	Change**
Verbal						
Total	370,794	49.7	9.9	514	101	1.8
Gender Groups						
Male	157,202	49.7	10.0	520	101	2.3
Female	213,399	49.7	9.8	510	100	1.4
Ethnic Groups						
Native American	1,630	48.7	10.1	506	103	1.9
African American	34,633	44.0	9.5	453	95	1.3
Asian American	32,305	48.4	11.2	504	114	2.0
Hispanic American	27,975	46.1	9.7	474	100	1.4
White	260,504	51.0	9.3	528	95	1.8
Math						
Total	370,794	48.7	10.1	515	104	2.9
Gender Groups						
Male	157,202	50.9	10.5	539	106	3.0
Female	213,399	47.1	9.5	499	100	2.8
Ethnic Groups						
Native American	1,630	47.2	10.0	498	101	2.6
African American	34,633	41.5	8.7	437	93	2.2
Asian American	32,305	52.7	10.8	561	109	3.4
Hispanic American	27,975	44.7	9.5	472	99	2.5
White	260,504	49.6	9.7	525	99	2.9

*Totals include 193 students who did not indicate gender and more who did not indicate ethnicity.
**Score changes are on the PSAT/NMSQT scale and based on calculations of unrounded means.
Source: Lyu, Gilsdorf, and Schmitt (1996).

TABLE 11

**SCORE CHANGES AT PARTICULAR SCORE LEVELS FOR STUDENTS WHO TOOK
THE PSAT/NMSQT AS JUNIORS IN 1994 AND THE SAT I AS SENIORS IN THE FALL OF 1995**

| Junior PSAT/NMSQT Score Levels | Senior SAT I | | | Score Change* |
	N	Mean	SD	
Verbal				
70	1,689	694	52	-0.6
60	9,233	609	47	0.9
50	12,993	515	50	1.5
40	8,588	424	54	2.4
30	2,230	353	60	5.3
20	1,603	309	63	10.9
Math				
70	1,260	701	46	0.1
60	7,365	620	50	2.0
50	12,503	529	50	2.9
40	14,364	434	52	3.4
30	2,988	350	56	5.0
20	335	313	56	11.3

*Score changes are on the PSAT/NMSQT scale.
Source: Lyu, Gilsdorf, and Schmitt (1996).

noted earlier, maturation and student growth are likely to be responsible for these small average increases when the amount of time between testing increases. Again, the gain on the math test is slightly larger than the gain on the verbal test and those who score lower on the PSAT/NMSQT make greater gains on the SAT I than high-scoring PSAT/NMSQT takers. Low scoring test takers have more room for improvement.

CONCLUSIONS

It is clear that students show different patterns of score change between the PSAT/NMSQT and the SAT I and between consecutive testings of the SAT I. There are a number of reasons for these individual differences. The first considers regression to the mean (i.e., the amount of score change or growth depends on the initial score range). In this case, the lower the initial score, the more room there was to go up. Therefore, those students with a lower initial score experienced more change. The second reason for different patterns of score change concerns the length of time between testings. Data indicate the longer the time span between testings, the more likely one will see larger score changes. This may be accounted for by several factors, including academic growth, practice effects of taking the SAT I, practice taking the PSAT/NMSQT, or a combination of these.

The general trend was that students with moderate first time SAT I scores were typically successful at improving their scores with the second testing. Data suggested, however, that scores between testings did not continue to rise at a steady pace, regardless of the number of times the test was taken. There are a number of factors mediating whether a score will change, and by what magnitude. These include the general ability level of the student, the length of time between testings, and the number of times the test was taken. The analyses in this report suggest that the more times students take the test, the fewer points they will gain, and the variance between their scores will decrease.

Individual differences in score change also may be accounted for by ethnic and gender differences. Data indicate that the average gain on the verbal test for students who took the SAT I as juniors in the spring of 1995 after taking the PSAT/NMSQT as juniors in 1994 was .8, slightly lower than the average gain on the math test, which was 2.1.[6] These statistics, however, are for the total sample. When examined by gender, the trend was slightly different. Specifically, the gain on the verbal test for male students was slightly larger than the gain for female students, whereas there were no meaningful differences on the math test. Regarding ethnic differences, Native-American and white students achieved the largest gain on the verbal test, while Asian Americans achieved the largest gain on the math test.

Nearly one-half of all students retake the SAT I and a slightly larger proportion of females retest than males. Results from retesting on the SAT I indicate that 4 percent of students find a score increase of 100 or more points on the verbal or math tests and that, on average, higher-ability students take the SAT two or three times. Males retesting twice or three times averaged a score increase of 20.6 points versus 16.2 for females. The extent of score change is related to a student's initial score. Students who choose to retake the SAT I more than once may differ in meaningful ways from those who do not. For example, a higher proportion of females retest than males, and such differences can affect the generalizability of the data. All interpretations of test scores must consider several indices, such as test reliability, standard error of measurement, and standard error of difference in determining the extent individual scores must vary to indicate meaningful differences.

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NOTES

1. This *Research Notes* summarizes findings from research published in C. F. Lyu and I. Lawrence (1998) and C. F. Lyu, J. Gilsdorf, and A. Schmitt (1996).

2. This number excludes students who took the SAT I in their sophomore year, in part because the percentage of sophomore test takers was quite small and in part because the target population for the SAT I consists of juniors and seniors.

3. The PSAT/NMSQT was modified in 1997-98 to include a measure of developing writing skills and slight changes were also made to the verbal and mathematics scales so results may differ slightly.

4. Similar data on score changes by ethnic groups can be found in Lyu and Lawrence (1998), but are generally consistent with data presented for the PSAT/NMSQT in Table 8.

5. C. F. Lyu, J. Gilsdorf, and A. Schmitt (1996).

6. Note these gain scores are on the PSAT/NMSQT scale.

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APPENDIX. SAT I REPEAT TESTING PATTERNS				
Number of Tests	***n***	**Repetition Patterns**	***n***	**percent**
One	567,495	Jr.	283,166	50
		Sr.	284,329	50
Two	426,569	Jr., Jr.	41,561	10
		Jr., Sr.	338,305	79
		Sr., Sr.	46,703	11
Three	107,870	Jr., Sr., Sr.	47,998	44
		Jr., Jr., Sr.	53,743	50
		Jr., Jr., Jr.	2,653	02
		Sr., Sr., Sr.	3,476	03
Four	15,633	Jr., Sr., Sr., Sr.	3,669	23
		Jr., Jr., Sr., Sr.	8,142	52
		Jr., Jr., Jr., Sr.	3,428	22
		Jr., Jr., Jr., Jr.	164	01
		Sr., Sr., Sr., Sr.	230	01
Five	2,417	Jr., Sr., Sr., Sr., Sr.	363	15
		Jr., Jr., Sr., Sr., Sr.	900	37
		Jr., Jr., Jr., Sr., Sr.	850	35
		Jr., Jr., Jr., Jr., Sr.	261	11
		Jr., Jr., Jr., Jr., Jr.	29	01
		Sr., Sr., Sr., Sr., Sr.	14	00