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ABSTRACT

The Scholastic Assessment Test (SAT) I is designed for use with juniors and seniors in high school as part of the college admissions process. Of the nearly 3 million students who took the SAT I in 1998-1999, more than 130,000 were seventh and eighth grade students (more than 110,000 in 1997-1998). While most of these students take the SAT I as part of a talent identification program (TIP), the appropriateness of the test for these students has been questioned. Little is known about the background demographics and performance of the total group of middle school students because TIP students do not routinely provide the same level of background information as do high school students taking the SAT I, nor are their data maintained in the SAT Program files. As part of a special project, middle school students tested in 1997-1998 and 1998-1999 (242,897 students) were extracted from the SAT Program files and their performance analyzed. Differences in demographics were noted for the middle school students. For example, about 52% of the seventh and eighth graders were male, with 48% female, compared with the college bound senior cohort where about 46% are male and 54% female. Analyses also reveal that the performance of middle school students covered the entire range of SAT scale, with the majority falling within a narrow score range compared to the college bound cohort. Eighth graders outperformed seventh graders on both verbal and mathematics as evidence by substantially higher scores. In addition, the mean scores for eighth graders on mathematics were higher than those for the college bound cohort. (Author/SLD)

Evaluating the Appropriateness of the SAT I for 7th and 8th Graders

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Paper presented at the annual meeting of the National Council on Measurement in Education, New Orleans, April 2000.

Abstract

The SAT I: Reasoning Test is designed for use with juniors and seniors in high school as part of the college admissions process. Of the nearly 3 million students who took the SAT I in 1998-99, over 130,000 were 7th and 8th grade students (over 110,000 in 1997-98). While most of these middle school students take the SAT I as part of a talent identification program (TIP), the appropriateness of the SAT I for these students has been questioned. Individual talent identification programs provide feedback to students based on those students who apply to the specific program. However, little is known about the background demographics and performance of the total group of middle school students. This difficulty exists because TIP students do not routinely provide the same level of background information as other students taking the SAT, nor are the data maintained in the SAT Program files. As a result, it has been difficult to evaluate this nontraditional testing group. As part of a special project, middle school students who tested in 1997-98 and 1998-99 were extracted from the SAT Program files and their performance analyzed. Differences in demographics were noted for the middle school students compared to the traditional SAT I test taking cohort. For example, about 52% (for both years) of the 7th and 8th grade test takers were male and 48% female compared to the College Bound Senior cohort where about 46% are male and 54% female. Analyses further revealed that the performance of middle school students covered the entire range of the SAT scale, with the majority of students falling within a narrow score range compared to the CB cohort. Eighth graders outperformed 7th grade test takers on both Verbal and Math as evidenced by substantially higher mean scores. In addition, the mean scores for 8th graders on Math were higher than those for the CB cohort.

The SAT I: Reasoning Test is designed for use with juniors and seniors in high school to assist in the college admissions process. Of the nearly 3 million students who took the SAT I in 1998-99, over 130,000 were 7th and 8th grade students (over 110,000 in 1997-98). The majority of these middle school students are invited to take the SAT I as part of a regional talent identification program (TIP). They represent an atypical sample of middle school students, having scored at least on the 95th percentile on a standardized achievement test given in their school district.

The TIPs are designed to identify, challenge, guide, and reward young people with exceptional academic talent. TIPs offer continued contact and support throughout high school years, act as a resource for the middle schools serving these students, and provide opportunities for further growth for the student (e.g., summer institutes, annual seminars). Most TIPs began in the early 1980's, building on the work of Julian Stanley done at the Johns Hopkins University with gifted youth in the early 1970's. There are six major TIPs, with 70% of the students participating in just two programs: Center for Talented Youth (CTY) at Johns Hopkins; Duke Talent Search Program; Midwest Talent Search at Northwestern University; Rocky Mountain Talent Search at the University of Denver; Iowa Talent Search at Iowa State University; and the UCI Talent Search at the University of California, Irvine.

Students typically qualify for participation by scoring at the 95th percentile in verbal and/or math on a nationally-normed and age-appropriate standardized test (e.g., CAT, MAT, CTBS, etc.). The individual TIP may have additional requirements, such as recommendations. Because the scores of these very able students tend to top out on the age-appropriate tests used to qualify for participation in the TIPs, several programs began exploring the use of the

SAT as a screening for participation in the mid-1980's. In addition to challenging such students, the SAT I "spreads out" their scores so the most able students can be identified.

Middle school students taking the SAT I are offered two options. First, they make take the paper-based SAT I during the December and January administrations (most elect to take the January administration). Second, a computer-delivered version of the SAT is available for these students. The computerized SAT was first offered in 1996-97 as part of a joint project with CTY. Its use is restricted to students in the 8th grade or below and the number of students who opt to take the computerized version of the test is relatively low (approximately 5,000 – 6,000 per year). Only five of the TIPs accept scores from the computerized SAT (CTY, Midwest, Iowa, Rocky Mountain, and UCI) and CTY participants account for over 95% of the testing volume. Scores from either version of the SAT I are only reported to the TIPs, not to colleges, and are purged from ETS' files at the completion of the testing year.

The standard SAT I score report is issued to each student following testing. Interpretive information is based on the same information provided to high school test takers. For example, both national and state percentiles are based on the College Bound Senior cohort. The individual programs provide feedback to their participants based on the students who applied to the specific TIP. However, information on the demographics and performance of the total group of students is dated (Wilder, Casserly and Burton, 1988) and has not been routinely examined. Several problems have contributed to the inability to evaluate this non-traditional testing group. First, middle school students do not routinely complete the demographic information that other test takers complete prior to taking the SAT I. Second, it has been difficult to retrieve data once it is purged from the SAT Program files. As a part of a special project, middle school students who tested in 1997-98 and 1998-99 were extracted from SAT

Program files prior to the data being purged.

Sample

All students who took the SAT I during the 1997-98 and 1998-99 testing years and who indicated their current grade level as "8th grade" or "Not yet in 8th grade" were included in the sample. A total of 242,897 students were used in the analysis; 110,151 from 1997-98 and 132,746 from 1998-99. Table 1 displays the number of students by gender, grade level, and ethnicity/racial group. Information on grade, gender, and ethnicity is obtained from background information completed at the time of test registration. However, TIPs advise students that ethnicity and other background information (e.g., course experience, school activities) is optional and does not need to be completed by the student. As a result, only a small percentage of students provide this information and therefore, no analyses were performed by ethnicity/race.

Results

Demographics. As can be seen in Chart 1, there are slightly more boys than girls who take the SAT I as a middle school student (about 52% boys and 48% girls, for both years). This proportion is different from that seen with the College Bound Senior cohort, where female test takers are in the majority (about 54% female and 46% male). This discrepancy could be the result of a number of things, including: (1) a higher proportion of boys are believed to fall into the "gifted" category and thus more boys would qualify to participate in talent identification programs; (2) boys might out-perform girls on standard school-based achievement tests; (3) middle schools might distribute TIP materials disproportionately among boys and girls; or (4) a

higher proportion of boys and their families may elect to participate in the talent identification process.

Chart 2 provides information on grade level for the 1997-98 and 1998-99 testing years. As is clearly indicated, the vast majority of students elect to participate in a TIP during the 7th grade. Some 7th grade test takers opt to repeat the SAT I if they failed to gain entry into the program the first time. The number of repeat test takers represented by the 8th graders is unknown.

Test Performance. Charts 3 and 4 show the distribution of SAT I: Verbal and Math scores for the combined group of 7th and 8th graders and the College Bound (CB) Senior cohort. (The CB cohort is comprised of all test takers who indicated a particular year of graduation. That is, students who graduated in 1998 make up the 1997-98 CB cohort and those who graduated in 1999 make up the 1998-99 CB cohort.)

A number of things are apparent from these charts. The Verbal and Math performance of the 7th/8th grade groups is highly similar for both years. (Note that is this also true for the CB cohort; however, similarity between years is expected for the cohort.) The 7th/8th graders' Verbal and Math performance also covers the entire range of the College Board 200 to 800 scale for both years. Only a small percentage of students (about 4% for Verbal and 2% for Math, both years) fall in the lower score ranges (200-290); this is comparable to that for the CB cohort, with about 3% of students falling in the lower score ranges for both Verbal years and Math (both years). However, a much smaller percentage of students are found for the 7th/8th grade group compared to the CB cohort at the top end of the scale (650-800): for Verbal, less than 2% of middle school students compared to 11% for CB cohort [both years]; for Math, less than 3% of middle school students compared to 13% for CB cohort [both years].

While the performance of the 7th/8th graders covers the entire distribution, the majority of middle school students are found within a narrower range of scores. For example, approximately 76% [1997-98] and 77% [1998-99] had Verbal scores falling between 350 and 540 while 78% [1997-98] and 76% [1998-99] had Math scores falling between 350 and 540. For the CB cohort, approximately 57% of students fell within that range on Verbal and 55% on Math.

Charts 5 and 6 provide information on mean scores by total group and by grade level. Not surprisingly, the CB cohort mean is higher than the 7th/8th grade mean for all tests, both years. For 1997-98, the 7th/8th grade Verbal mean was 450 (SD = 86) and the CB cohort mean was 505 (SD = 111); the Math mean was 466 (SD = 84) for 7th/8th graders and 512 (SD = 112) for the CB cohort. For 1998-99, the 7th/8th grade Verbal mean was 444 (SD = 86) and the CB cohort mean was 505 (SD = 111); the Math mean was 470 (SD = 85) for the 7th/8th graders and 511 (SD = 114) for the CB cohort. The 7th/8th grade test takers are clearly a more homogeneous group compared to the CB cohort.

Furthermore, Charts 5 and 6 indicate that the 8th grade test takers outperform the 7th graders on both Verbal and Math. For Verbal, the mean scores for the 7th and 8th graders are quite different (57-60 scaled points); for Math, the differences are slightly larger (60-62 scaled points). The differences between the 8th graders and the CB cohort are much smaller for Verbal (11-15 scaled points). For Math, the 8th graders outperform the CB cohort: in 1997-98 the 8th grade mean was 1 point *above* the CB cohort mean and in 1998-99 the 8th grade mean was 5 points *above* the CB cohort mean. This undoubtedly reflects the high ability level, especially in mathematics, of the relatively small number of 8th graders who opt to take the SAT I.

Summary

The SAT I is designed to measure the Verbal and Math reasoning abilities of high school juniors and seniors. These abilities develop over a long period of time and are independent of particular school curriculum. The performance of 7^{th} and 8^{th} graders on the SAT I is amazing, especially when considering the age of these students. While these students do, on average, perform slightly less well than students belonging to the group for whom the test is designed, many of them score as well as, or better, than many high school students. The use of the SAT I by talent identification programs does not seem to penalize students who elect to take the test. For many talent identification programs, the use of the SAT I provides them with an additional mechanism to identify, guide, and reward young students with exceptional academic talent.

Table 1. Number of Middle School Test Takers
By Testing Year

	1997-1998	1998-1999
Total		
	110,151	132,746
Gender		
Male	57,235	69,602
Female	52,886	63,137
Grade		
7^{th}	85,988	100,119
8^{th}	24,163	32,627
Ethnicity		
American Indian	98	110
Asian American	1,729	1,997
African American/Black	444	502
Hispanic/Latino	286	323
White	8,088	9,342
Other	348	373

Chart 1. SAT I Middle School Test Takers by Gender

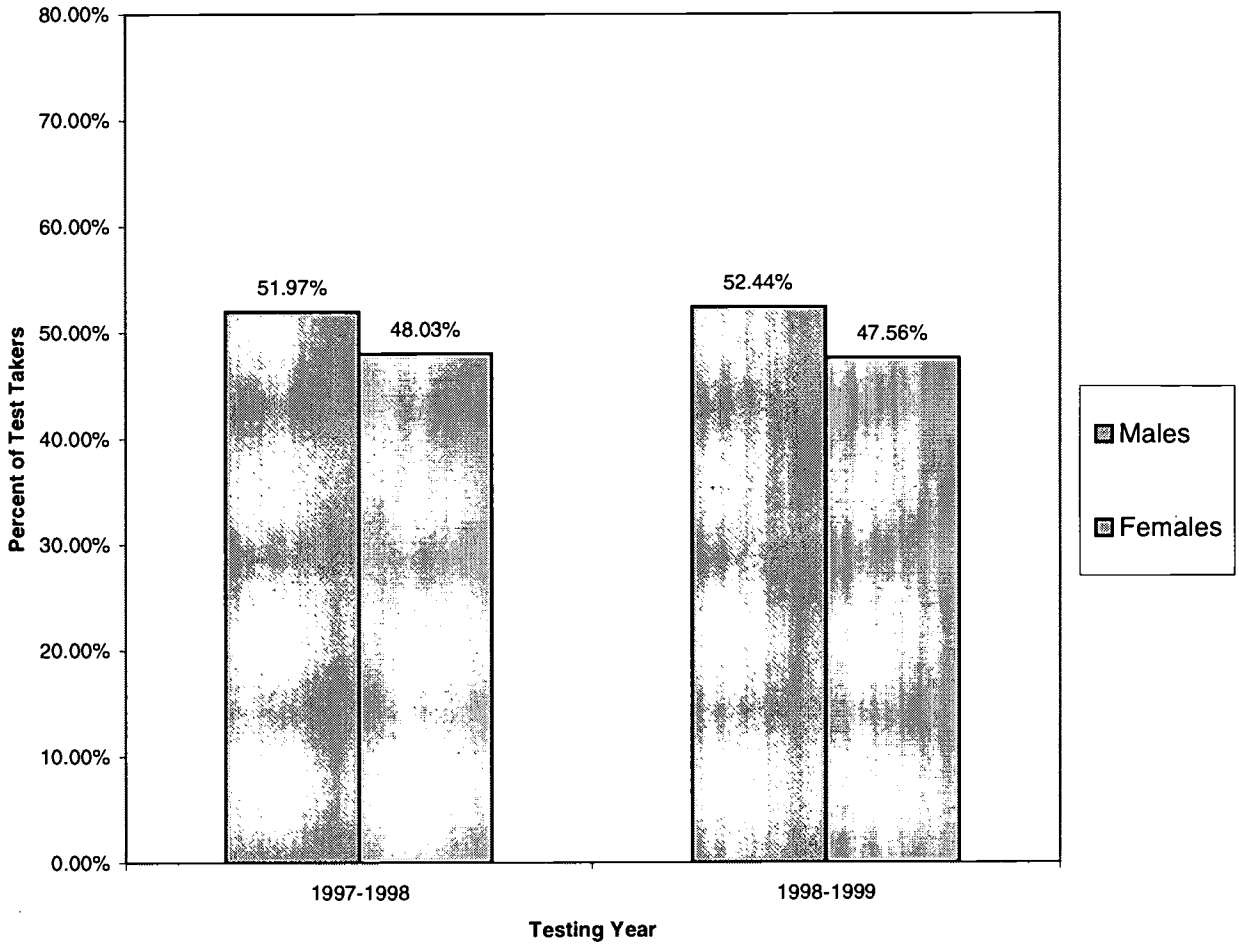


Chart 2. SAT I Middle School Test Takers by Grade Level

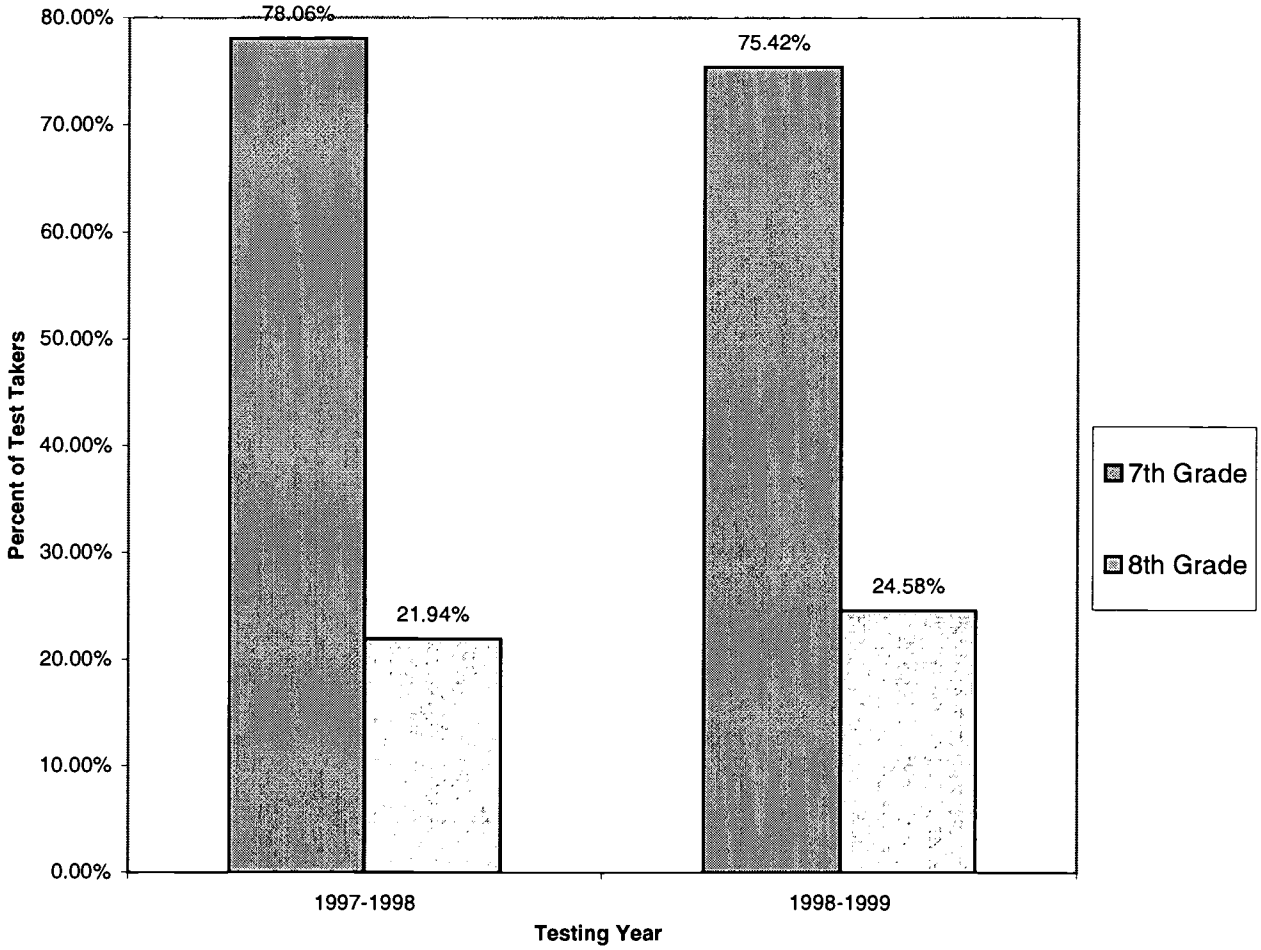


Chart 3. Distribution of SAT I: Verbal Scores

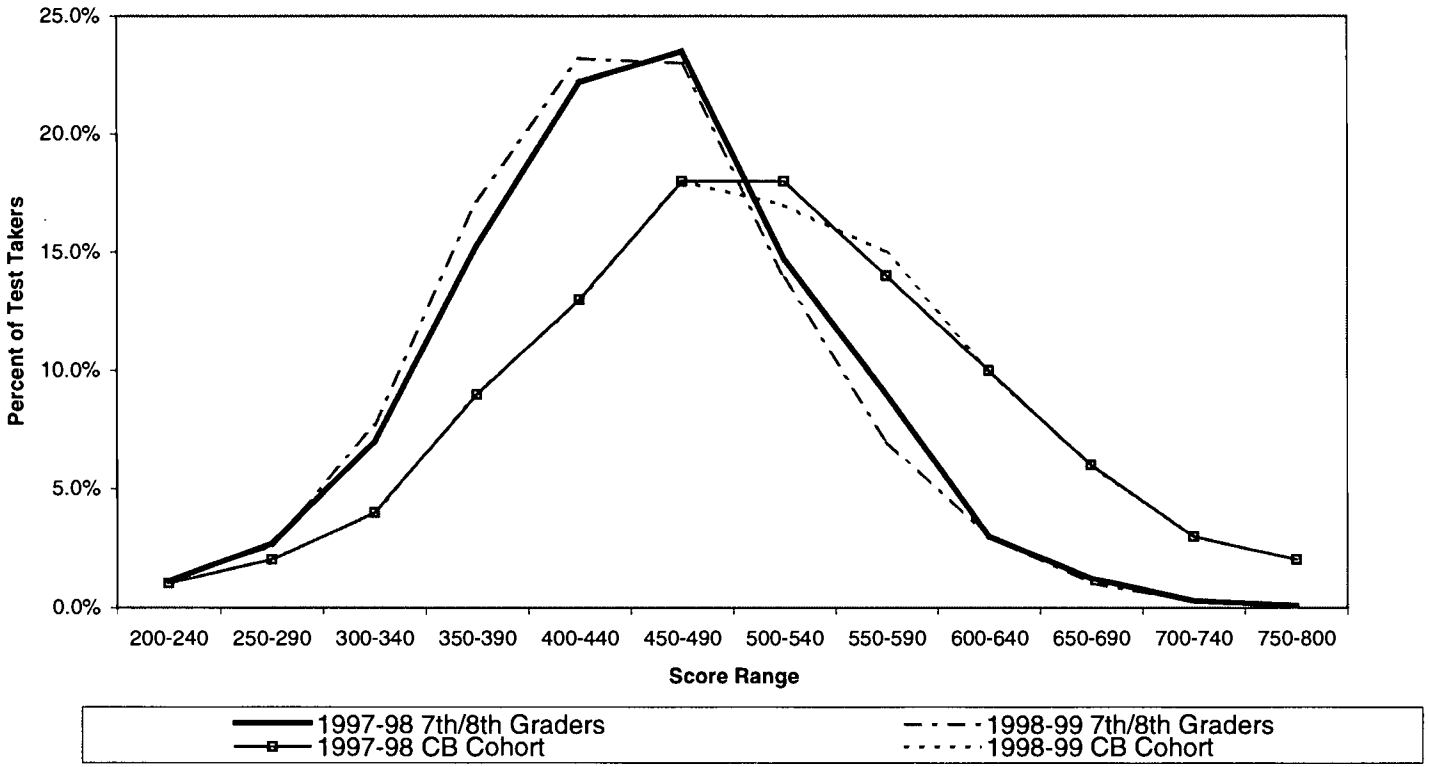


Chart 4. Distribution of SAT I: Math Scores

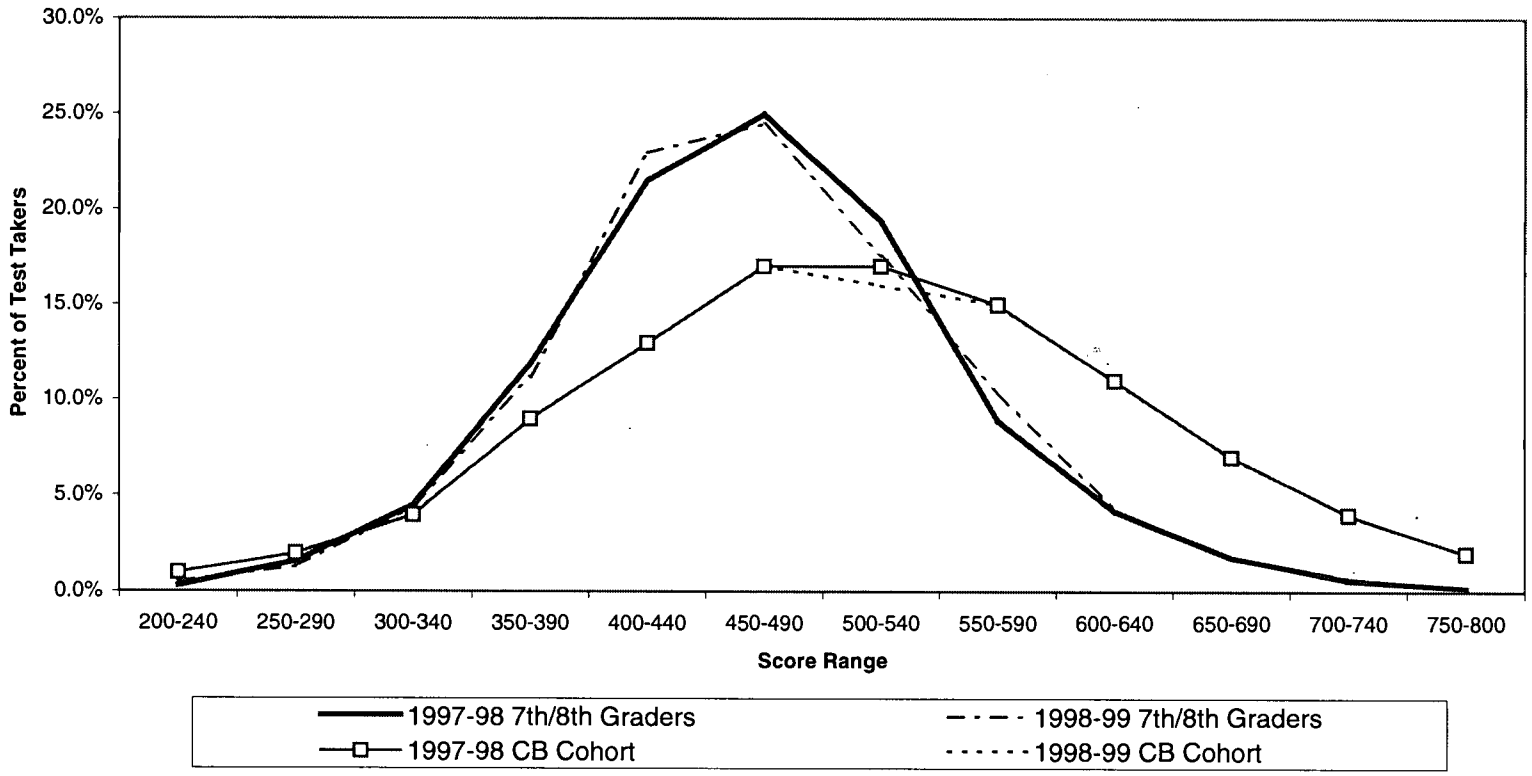


Chart 5. Mean SAT I: Verbal Scores

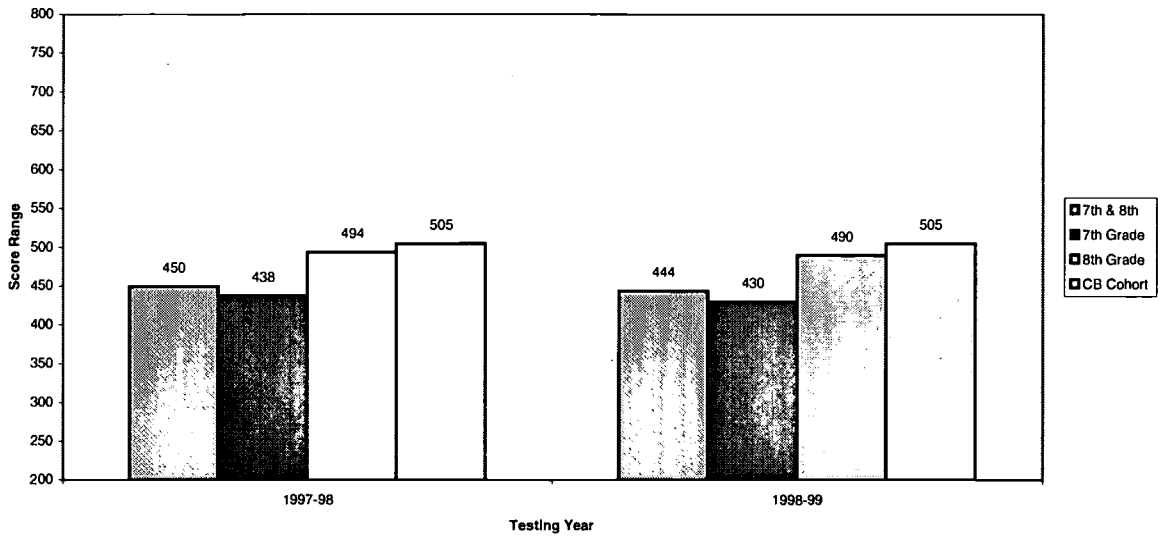
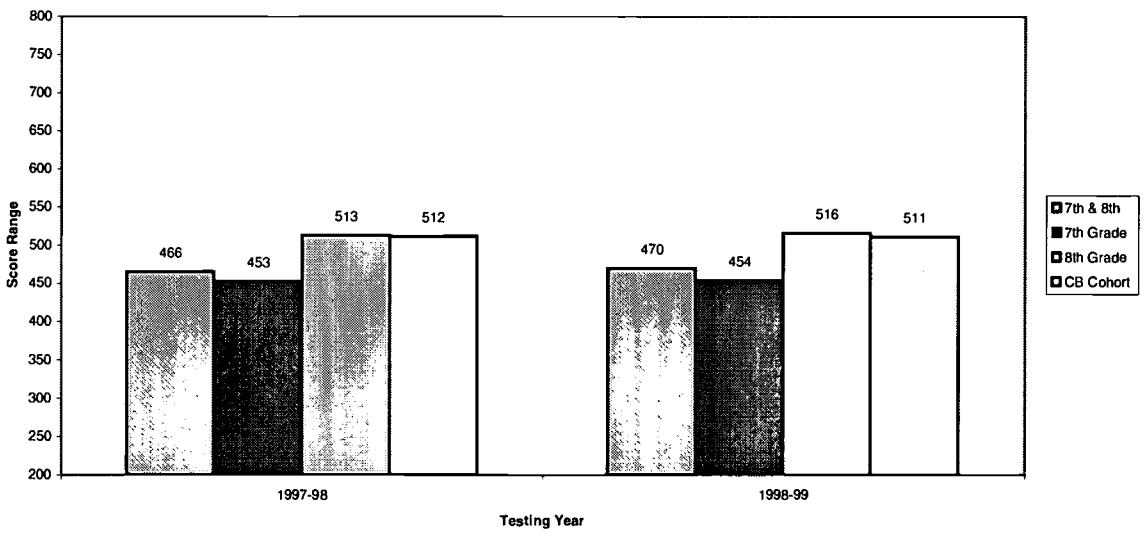


Chart 6. Mean SAT I: Math Scores



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