



Characteristics of Minority Students Who Excel on the SAT and in the Classroom



*Listening.
Learning.
Leading.*

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Preface

After a few decades of keeping a watchful eye, substantial gaps in the average standardized test scores of White and some minority group students persist. The average group differences on the SAT are among the most visible examples of this pattern. But when we focus only on mean score differences among students, we tend to overlook the relatively high performing minority students. Many minority students achieve high SAT scores, pursue challenging courses in high schools, take leadership roles in extracurricular activities, and go on to succeed in selective colleges. These students are the focus of this report.

The authors, Brent Bridgeman and Cathy Wendler, identify minority students who achieve relatively high SAT scores and examine aspects of their family background, high school course-taking experiences, and leadership activities. Among the questions they explore are the following three: Do minority students with high test scores take the same high school courses as

White students with high test scores? Are they equally successful in these courses? Do minority students who take demanding courses in high school, and succeed in those courses, perform as well on the SAT as White students?

Bridgeman and Wendler's findings reassure us that regardless of race/ethnicity, students who take rigorous courses and actively participate in their high schools tend to achieve high scores on the SAT. The implications that are clear from Bridgeman and Wendler's research are that meaningful dividends are derived from investments 1) in ensuring that all students are provided with the opportunity to participate in rigorous high school curricula, and 2) from student efforts to take full advantage of learning opportunities when they are available.

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Executive Summary

The familiar term “achievement gap” describes racial/ethnic differences that exist in many academic areas, including average SAT® scores. But if we focus only on the average gap, we may overlook the fact that many minority students defy stereotypes and receive high SAT scores, succeed in rigorous high school courses, and excel in college. In this report, we attempt to better understand the characteristics and ambitions of these academic superstars from diverse racial/ethnic backgrounds by examining characteristics of these students in terms of high school courses taken, participation in school activities, leadership experiences, academic success, and parental education.

Using data from the national cohort of students who took the SAT in 2001, some minor differences in academic accomplishments related to racial/ethnic classification were noted for these high-scoring students, but there were more similarities than differences. High-scoring students across all groups tended to take the same types of courses and participated in school activities at about the same level. They tended to be equally successful in these courses, although African American students reported slightly lower GPAs. There were, however, some unexpected differences seen for lower-scoring students. For example, at the middle and low score levels, African American and Hispanic students were *more* likely to take advanced science classes and Advanced Placement (AP) tests than their White and Asian American counterparts. Lower-scoring African American and White students reported being *more* involved in school activities in leadership roles than Asian American and Hispanic students. Within each score range, a greater percentage of White students indicated having at least one parent with a college degree compared to other racial/ethnic subgroups.

We also looked at the percentage of students in each racial/ethnic group who scored over 500 on either the verbal or math sections of the SAT, and who also had outstanding academic records. After accounting for academic background (using a core set of courses,

grades, leadership roles, and success in an Advanced Placement course) the percentage of students scoring over 500 on the SAT was essentially identical across racial/ethnic groups. Regardless of group membership, excelling in rigorous courses goes with high SAT scores. It is impossible to tell from the current data whether succeeding in demanding courses leads to high SAT scores, or whether possessing the reading and math skills measured by the SAT causes students to do well in these courses, or whether some outside factor leads to success in both the school-based and test-based assessments. It seems likely that all of these explanations are at least partially correct, so we suggest that a prudent policy would encourage students to take demanding courses and work on the reading and math skills that the SAT measures; at the same time, society should address such school-related factors as the quality of teaching and class size, and non-school factors such as poor nutrition.

Across all subgroups, the “academic superstar” students (those who scored 1300 or higher on the SAT and had very high course grades in demanding courses) generally reported having at least one parent with a college degree, providing support for the hypothesized benefit of the academic environment at home. Nevertheless, there were also many highly successful students from families without a college-educated parent.

Choices of college major seemed more related to academic background than to racial/ethnic group. There were only a few college major choices that were related to racial/ethnic group membership (e.g., Asian American students were less likely to select majors in the social sciences). Gender differences, on the other hand, were substantial, with men much more likely to select majors in engineering and women more likely to select majors in the biological sciences. Perhaps most significant for nurturing the next generation of outstanding students, the current generation of “academic superstars,” regardless of racial/ethnic or gender group, expressed virtually no interest in majoring in education.

Introduction

On average, African American and Hispanic students score much lower on the SAT® I: Reasoning Test (SAT) than do Asian American and White students. On average, African American and Hispanic students take fewer high school courses that are “associated with higher SAT scores” and have lower high school grades.¹ But, the proverbial statistician who drowned in the lake that was, on average, only three feet deep should remind us that the average can hide meaningful variation. In particular, there are many African American and Hispanic students who do have high SAT scores, and who have succeeded in rigorous high school courses. Our purpose here is to better understand the characteristics and ambitions of these exceptional students. Do minority students with high test scores take the same high school courses as White students with high test scores? Are they equally successful in these courses? Do minority students who took demanding courses in high school, and succeeded in them, do as well on the SAT as White students? Do minority students who excelled in high school and who had very high SAT scores have the same ambitions in terms of college major as White students with similar academic credentials?

Knowledge of similarities and differences among students from various subgroups becomes even more important in light of the changes to the SAT that will be introduced in Spring 2005. Some test content will be based on higher-level high school courses than before. Although taking advanced courses (e.g., three years of college-preparatory math) provides useful practice for the current SAT, such courses also will provide essential content knowledge for the new SAT. Understanding differences in classroom experiences will then become even more important in interpreting differences in group scores. Recent evidence suggests that only 32 percent of the students in the United States leave high school with the literacy skills and courses taken that are required for success in four-

year colleges. Among African American and Hispanic students the percentages are even smaller (20 percent and 16 percent respectively).²

Data Source

Data for the current analyses came from a database of students who were high school seniors in 2001, who had taken the SAT, and who had completed the SAT Questionnaire that students are asked to complete when they register to take the SAT.³ The SAT measures verbal and mathematical reasoning skills that develop over a long period of time, both inside and outside of school. The SAT Questionnaire responses consist of self-reported information on high school courses, extracurricular activities, family characteristics (e.g., parental education), projected college major, and other demographic information. Student records were from a matched database of students who had taken the SAT and other College Board Tests, including tests in the Advanced Placement (AP) program. AP offers college-level courses for high school students, and provides a way for colleges to grant college credit for students who do well on the end-of-course AP tests. Thus, doing well in AP courses provides evidence that the student not only has the potential to succeed in college-level work, but in fact has already done so.

Although our primary focus is on high-scoring and high-achieving students, we include two lower-scoring groups for comparison. Specifically, students in three score ranges were identified:

- top 10 percent (high range): students with a total SAT Verbal + Math score at or above 1300;
- middle 10 percent (middle range): students with a total Verbal + Math score between 1000 and 1050; and
- low 10 percent (low range): students with a total Verbal + Math score below 760.⁴

¹ College Board press release when “College Bound Seniors” report announced, August 2003.

² J. P. Greene & G. Forster, *Public High School Graduation and College Readiness Rates in the United States*. New York: Center for Civic Innovation at the Manhattan Institute, 2003.

³ This sample of over a million college-bound students should be adequate for our purposes, but it should be understood that students who did not take the SAT are excluded. They may have taken the ACT or chosen not to take any standardized test. Also excluded are the 16 percent of the examinees who chose not to answer the race/ethnic group question on the SAT Questionnaire.

⁴ If a student took the SAT more than once, we took the highest combined score from a single administration.

Table 1:

Number of Students in Each Selected SAT Score Range

| Group | SAT (V + M) Score Range | | |
|------------------|-------------------------|-----------------------|---------------|
| | High (≥1300) | Middle (1000-1050) | Low (<760) |
| African American | 1,561 | 9,195 | 36,296 |
| Asian | 14,250 | 8,486 | 8,146 |
| Hispanic | 3,012 | 9,624 | 21,281 |
| White | 76,065 | 86,230 | 35,538 |

Table 1 shows the number of students belonging to each of these three groups, by subgroup. Although African American and Hispanic students are clearly underrepresented in the high category, it is equally

clear that their numbers at these high score levels are not tiny. Thousands of African American and Hispanic students every year reach this very high level of attainment on the SAT.

High School Courses Taken

Taking a rigorous course load in high school has been shown to be one of the best indicators of succeeding in college through attainment of a bachelor's degree.⁵ And it has been observed that African American and Hispanic students, on average, are less likely to take such challenging courses as physics and precalculus or calculus.⁶ What is less clear is to what extent these differences in course-taking patterns differ by racial/ethnic group among students with high (and middle and low) SAT scores. That is, are minority students more or less likely to take demanding courses compared to White students with similar reading and mathematical skills? The majority of college-bound students from

all subgroups have taken 4 years of English and 3 to 4 years of mathematics, but there may be differences in the taking of other college preparatory classes, such as science and foreign languages. Therefore, we specifically investigated differences in course-taking patterns for these courses.

Science courses. Figures 1 through 3 show the percentage of students, by racial/ethnic group and SAT score level, who reported taking courses in chemistry, physics, or two years of biology. (Because nearly all students in our college-bound sample had one year of biology, we include only the graph for two years.)

Figure 1
Percentage of SAT Test Takers Taking at Least One Year of Chemistry, by Score Level and Racial/Ethnic Group

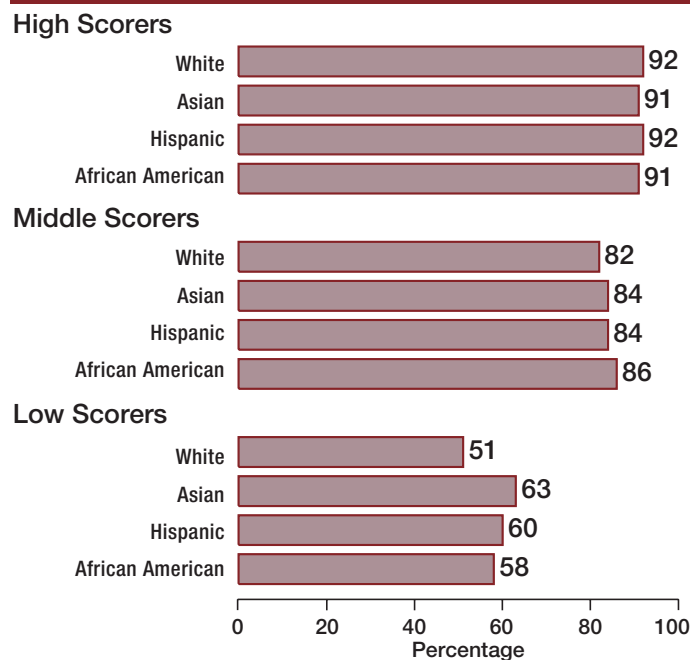
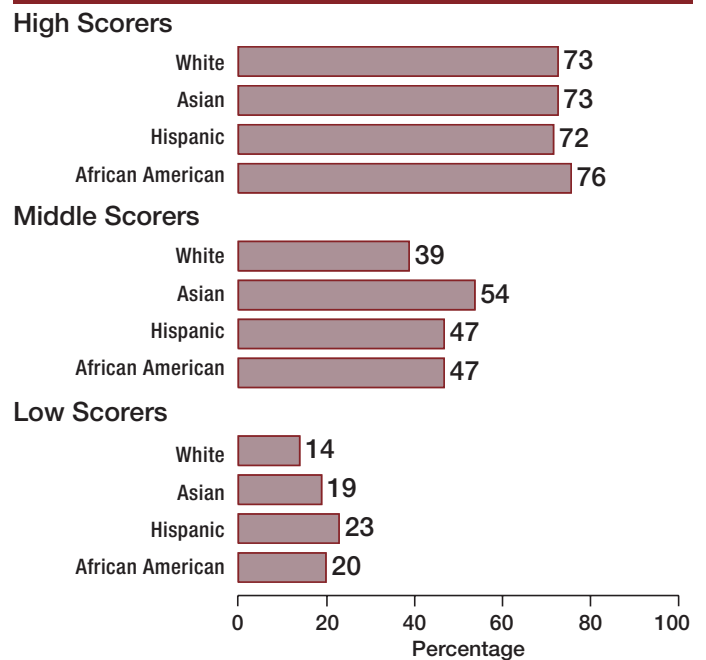


Figure 2
Percentage of SAT Test Takers Taking at Least One Year of Physics, by Score Level and Racial/Ethnic Group



⁵ C. Adelman, *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*. Washington, DC: U. S. Department of Education, 1999.

⁶ College Board, *College-Bound Seniors, 2003*. <http://www.collegeboard.com/press/article/0,3183,26858,00.html>. See "Tables and Related Items," Graph 8.

Overall, African American and Hispanic students are less likely than White students to take challenging courses. Within each score level, however, they are as likely or more likely to take such courses. This is an example of Simpson's paradox.⁷ The explanation of the paradox is that the African American and Hispanic students are relatively more numerous at the lower score levels, and fewer advanced courses are taken at these levels. The problem is not that high-scoring minorities do not take challenging courses, but rather that there are too few high-scoring minority students.

Although we may have a clearer idea of the problem, the solution remains elusive, especially given the

difficulty in determining what is cause and what is effect. It is possible that high-scoring students choose to take hard courses, and are successful in those courses, because possessing the verbal and quantitative reasoning skills measured by the SAT makes succeeding in such courses easier. It is equally reasonable to infer that they succeeded on the SAT because taking challenging courses provided better preparation to do well on the test, or that some critical outside factor (e.g., parental involvement) encouraged both academic success and success on the SAT. If we could close the test score gap between minority and White students, the gap in course taking might also close. But it might be difficult or impossible to close the test score gap as

Figure 3
Percentage of SAT Test Takers Taking at Least Two Years of Biology, by Score Level and Racial/Ethnic Group

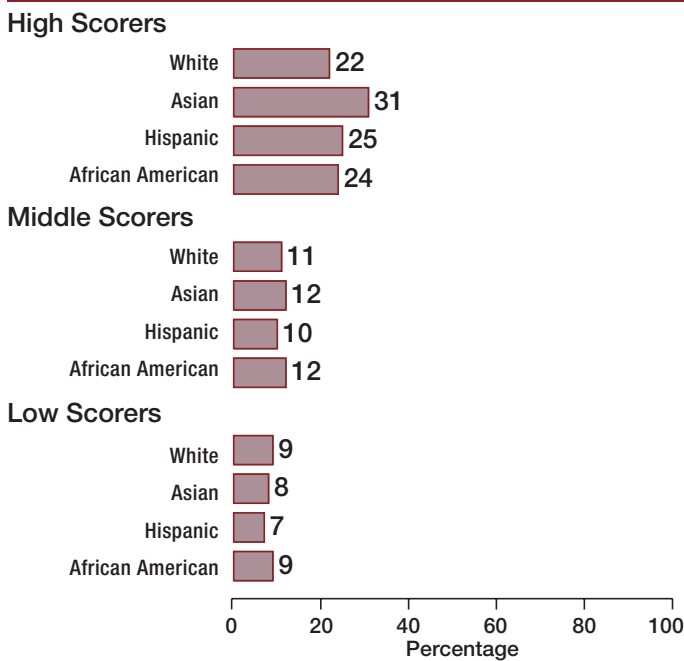
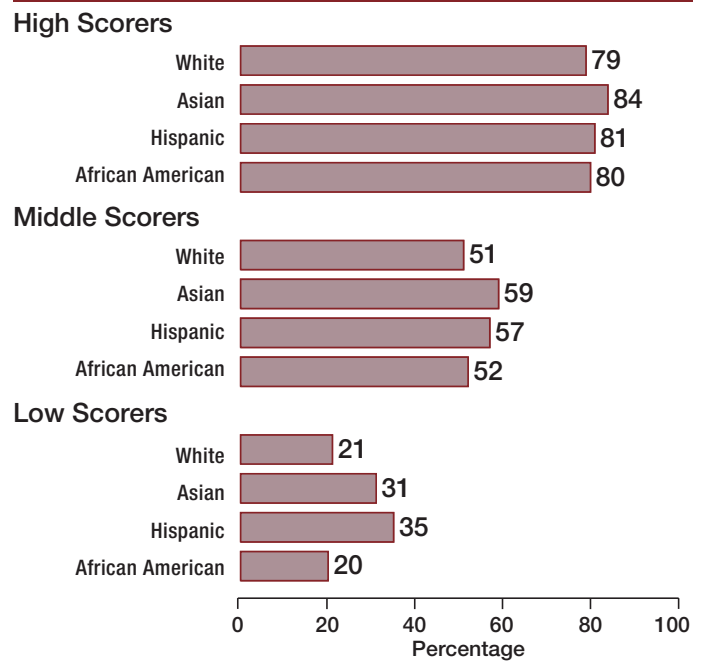


Figure 4
Percentage of SAT Test Takers Taking at Least Three Years of a Foreign Language, by Score Level and Racial/Ethnic Group



⁷ For a more complete description of this paradox, see H. Wainer, "Minority Contributions to the SAT Score Turnaround: An Example of Simpson's Paradox," *Journal of Educational Statistics*, 11, 1986: 229-244

long as students in the lower-scoring groups are not taking challenging courses.

Foreign languages. Figure 4 shows the percentage in each group that had taken at least three years of a foreign language. Once again, within score levels, the percentages for African American and White students are virtually identical, and percentages are slightly higher for Asian American and Hispanic students. The relatively high percentages for Asian American and Hispanic students in the lowest category may be related to taking “foreign” languages that are actually their native tongues.

Advanced Placement courses. The above results

were based on self-reports. Although we have no hard evidence that students in different racial/ethnic groups are differentially inflating their academic records, the possibility exists.⁸ Information on AP course taking (or more accurately, AP test taking) was obtained from official records, and so could not contain any reporting bias. Nevertheless, Figure 5 shows the now-familiar pattern. At the highest score level, there are essentially no differences across racial/ethnic groups in the percentage of students who took at least one AP test. At the middle and low score levels, African American and Hispanic students are actually more likely than White students to take AP tests.⁹ Figure 6 shows the pattern repeated for students who took two or more AP tests.

Figure 5
Percentage of SAT Test Takers Taking at Least One AP Examination, by Score Level and Racial/Ethnic Group

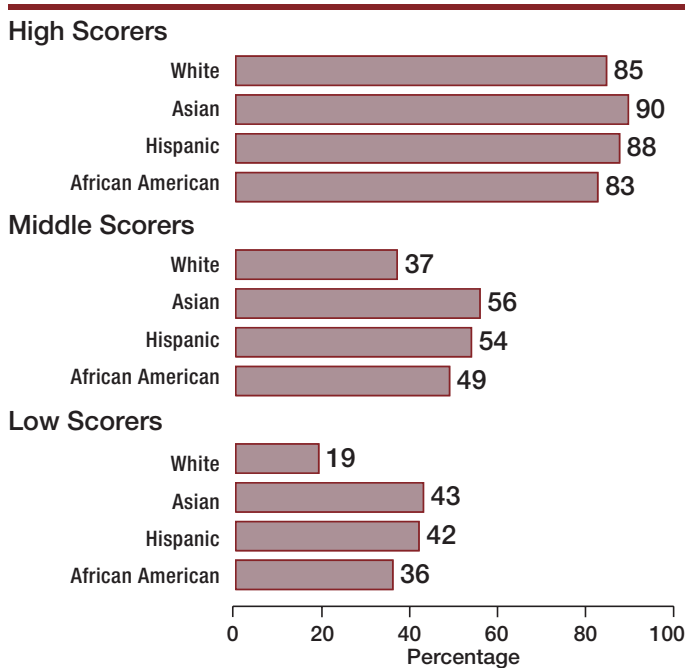
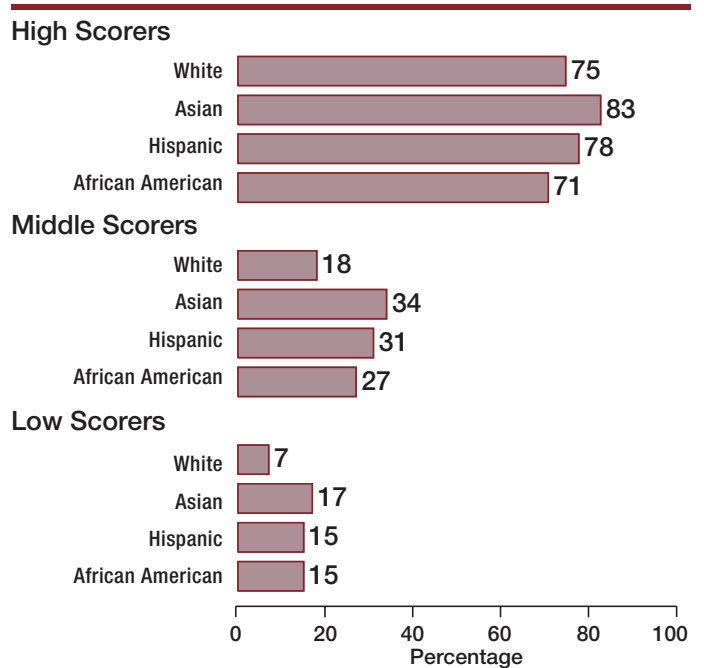


Figure 6
Percentage of SAT Test Takers Taking at Least Two AP Examinations, by Score Level and Racial/Ethnic Group



⁸ Feters, Stowe, and Owings (*Quality of Responses of High School Students to Questionnaire Items*. Washington, DC: National Center for Education Statistics, 1984) noted a tendency for African American and Hispanic high school students to inflate their reports of courses taken more than White students. However, in the more select group of college-bound students who take the SAT and respond to the SAT Questionnaire, such inflation may be less severe. Although we have no direct evidence of accuracy of reporting courses taken, Freeberg (*Analysis of the Revised Student Descriptive Questionnaire: Accuracy of Student-Reported Information*. New York: College Entrance Examination Board, 1988) noted that on the SAT Questionnaire, African American students were somewhat less accurate in reporting class rank, but that they were about as likely to under-report as to over-report; White students were slightly more likely to over-report.

⁹ Overall, a smaller proportion of African American students than White or Hispanic students take AP examinations (K. Hoffman, C. Llagas, & T.D. Snyder, *Status and Trends in the Education of Blacks*. Washington, DC: National Center for Education Statistics, 2003.) Thus, the observed pattern is another example of Simpson’s paradox in which the within-category results differ from the overall result.

Activities and Honors

The high school experience is more than just academic preparation. It also presents an opportunity for students to show their leadership potential through participation in extra-curricular activities. These activities can be in the form of a school club, sport team, academic team, etc. Mere membership in an organization may not represent any true commitment or accomplishment, but holding a leadership position or earning an honor (such as a journalism prize or a varsity letter) shows a greater degree of involvement.

Figure 7 presents a comparison of high-, middle-, and low-scoring students regarding leadership involvement in at least one extra-curricular activity; Figure 8 is for two or more activities. In both figures, racial/ethnic

differences are very small at the highest score level, as all racial/ethnic groups show a high degree of leadership involvement in their schools. Although high SAT scores would not seem to be a prerequisite for such involvement, note that there was considerably less involvement at the lower score levels. This may reflect an overall lower level of engagement with anything related to school among these low-scoring students. Racial/ethnic differences were essentially absent at the highest score levels, but at the middle and low levels, African American and White students appeared to be somewhat more involved than Asian American and Hispanic students.

Figure 7

Percentage of SAT Test Takers Who Reported Being an Officer or Receiving an Award for at Least One Activity, by Score Level and Racial/Ethnic Group

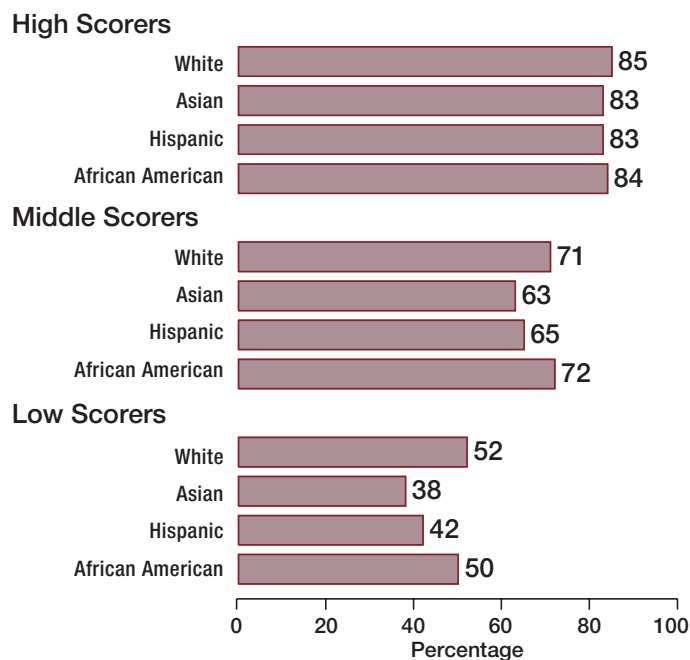
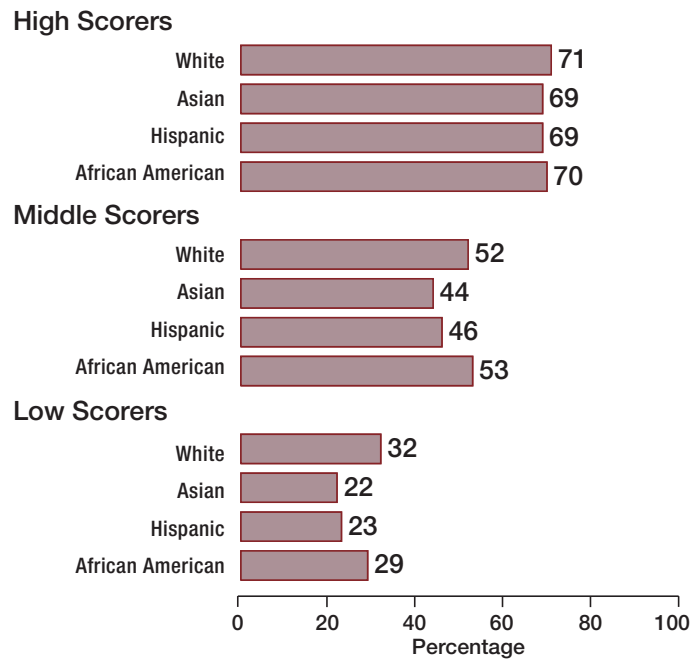


Figure 8

Percentage of SAT Test Takers Who Reported Being an Officer or Receiving an Award for Two or More Activities, by Score Level and Racial/Ethnic Group



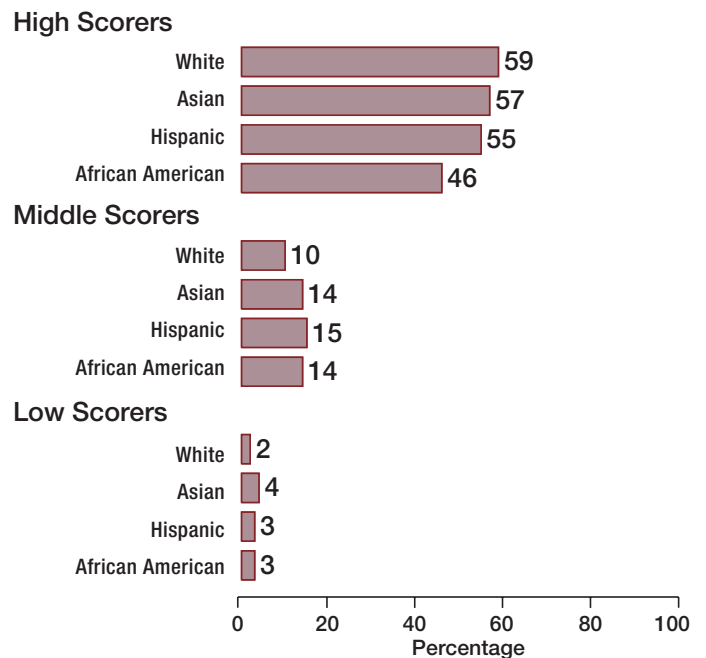
Academic Success

As indicated in Figure 9, there is a strong relationship between SAT score level and a high level of academic success in high school, defined as an “A” (including A+). African American students scoring in the high range report a GPA of “A” or above less frequently than do their Asian American, White, and Hispanic counterparts; in the middle and low score ranges, however, this discrepancy disappears. A more interesting pattern emerges when both gender and racial/ethnic classifications are considered simultaneously. As indicated in Figure 10, and consistent with previous research,¹⁰ across racial/ethnic groups, and across SAT score levels, women are more likely to have high GPAs than men. At the highest SAT level, African American women do not perform quite as well as women in the other racial/ethnic groups, but they still perform as well as the men in every one of the racial/ethnic groups.

Figures 11 through 15 show essentially the same pattern for “A” grades in English, math, natural science, social science/history, and art/music. Given the kinds of skills assessed by the SAT, the closer relationship of SAT scores to grades in academic courses than to grades in art and music is to be expected.

Figure 9

Percentage of SAT Test Takers Who Reported a GPA of “A,” by Score Level and Racial/Ethnic Group



¹⁰ See, for example, W.W. Willingham & N. S. Cole, *Gender and Fair Assessment*. Hillsdale, NJ: Erlbaum, 1997.

Figure 10

Percentage of SAT Test Takers Who Reported a GPA of "A," by Score Level, Gender, and Racial/Ethnic Group

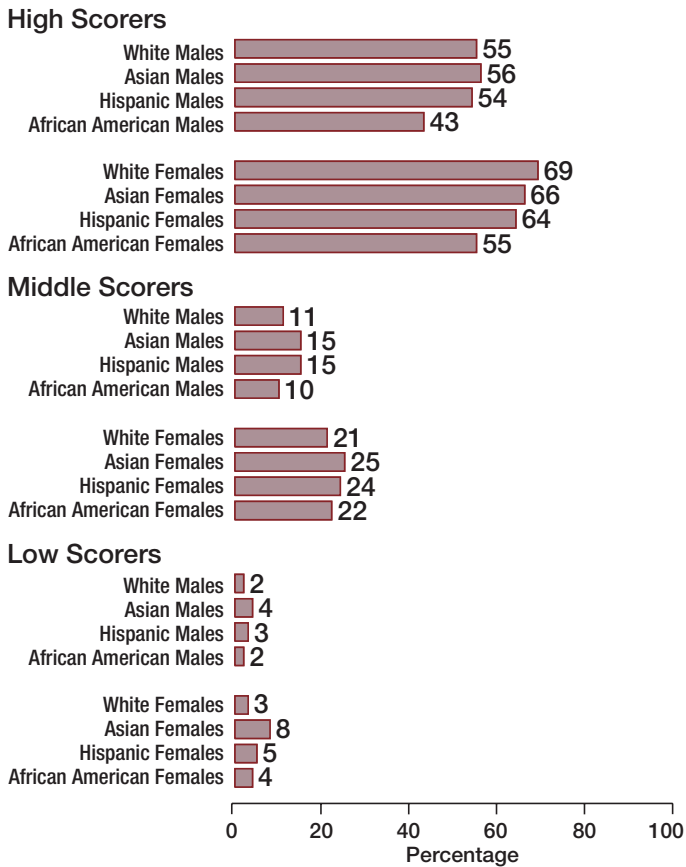


Figure 11

Percentage of SAT Test Takers Who Reported a GPA of "A" in English, by Score Level, Gender, and Racial/Ethnic Group

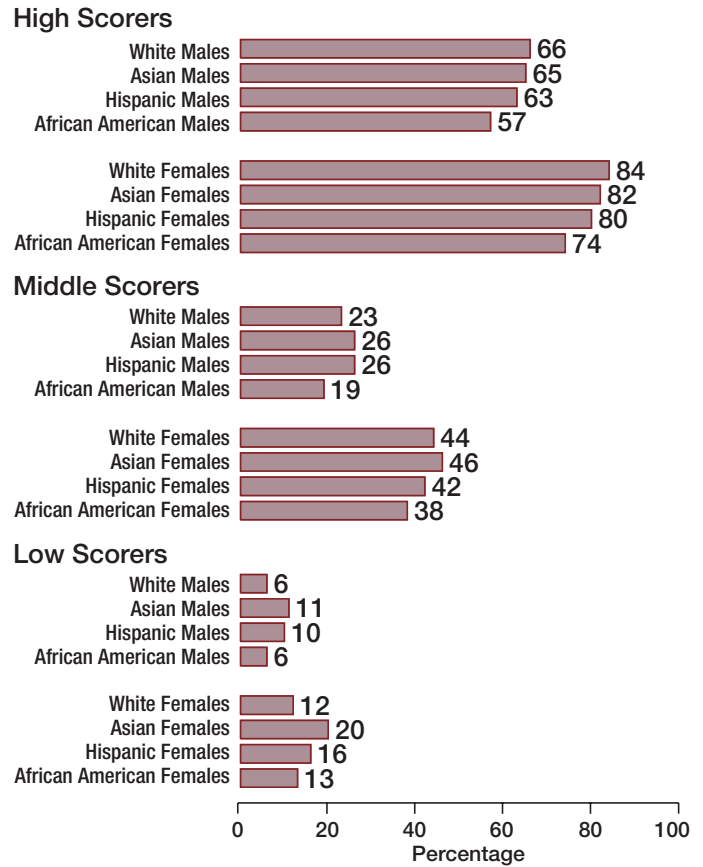


Figure 12

Percentage of SAT Test Takers Who Reported a GPA of “A” in Mathematics, by Score Level, Gender, and Racial/Ethnic Group

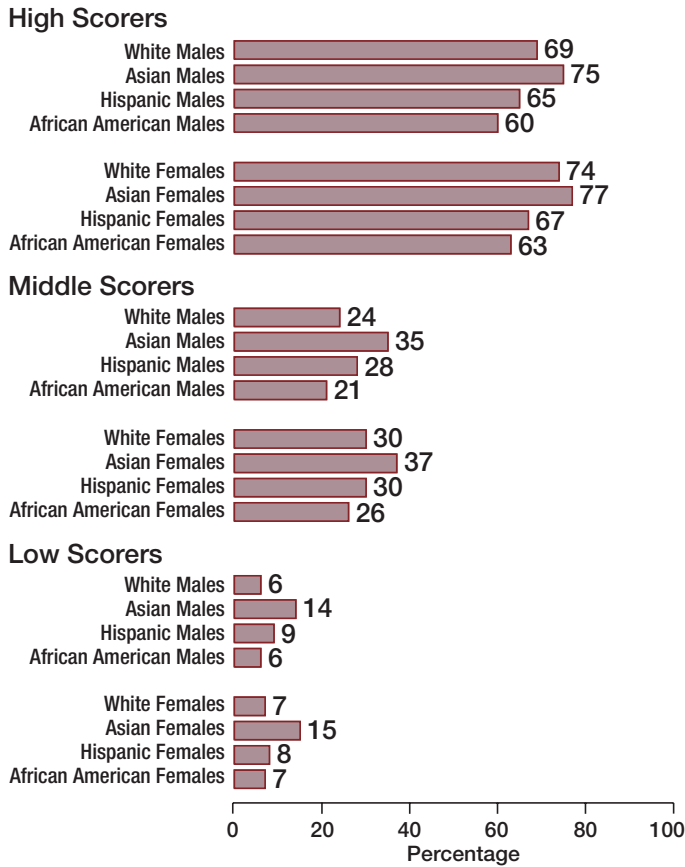


Figure 13

Percentage of SAT Test Takers Who Reported a GPA of “A” in Natural Science, by Score Level, Gender, and Racial/Ethnic Group

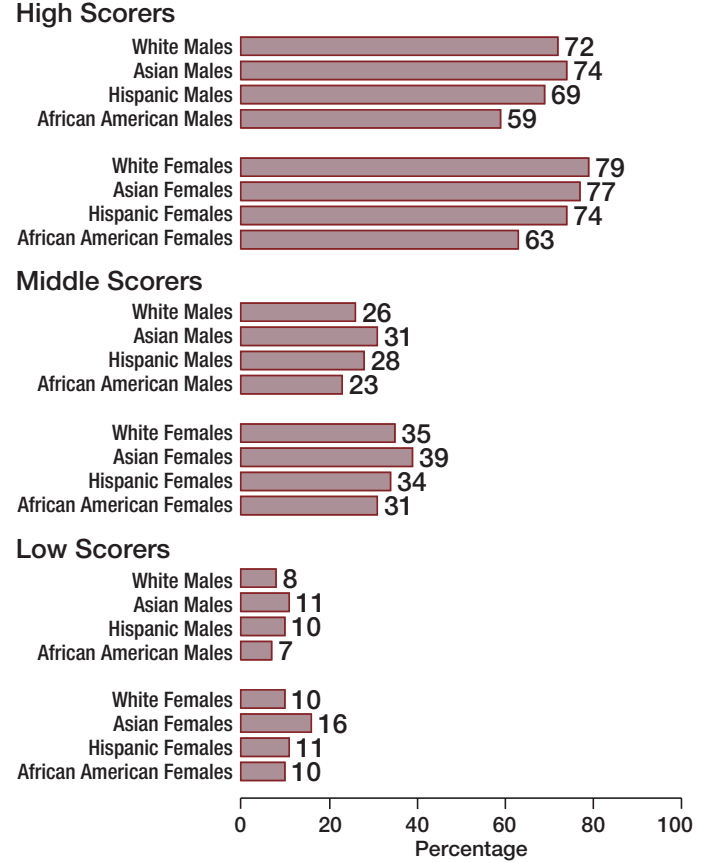


Figure 14

Percentage of SAT Test Takers Who Reported a GPA of "A" in Social Sciences/History, by Score Level, Gender, and Racial/Ethnic Group

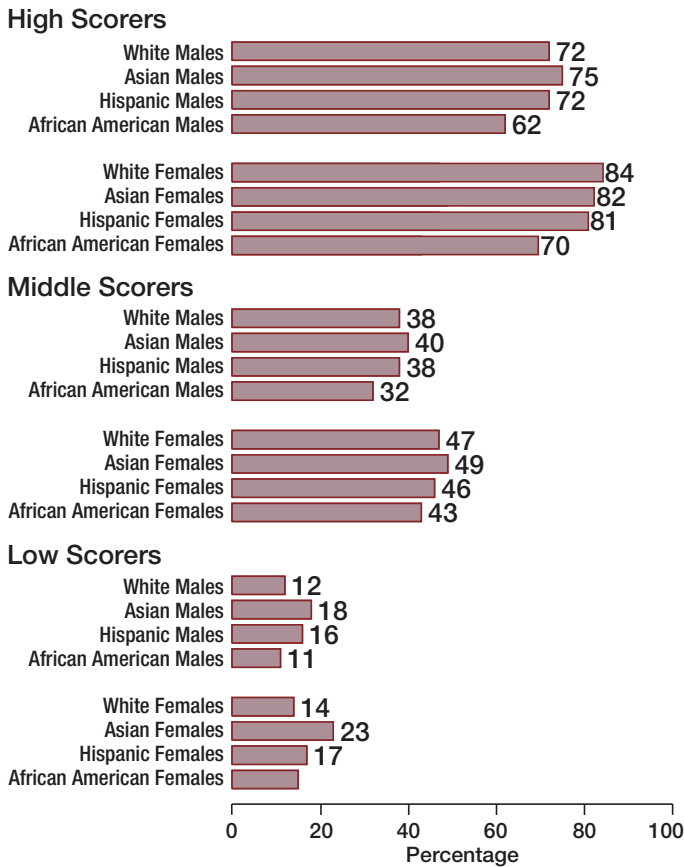
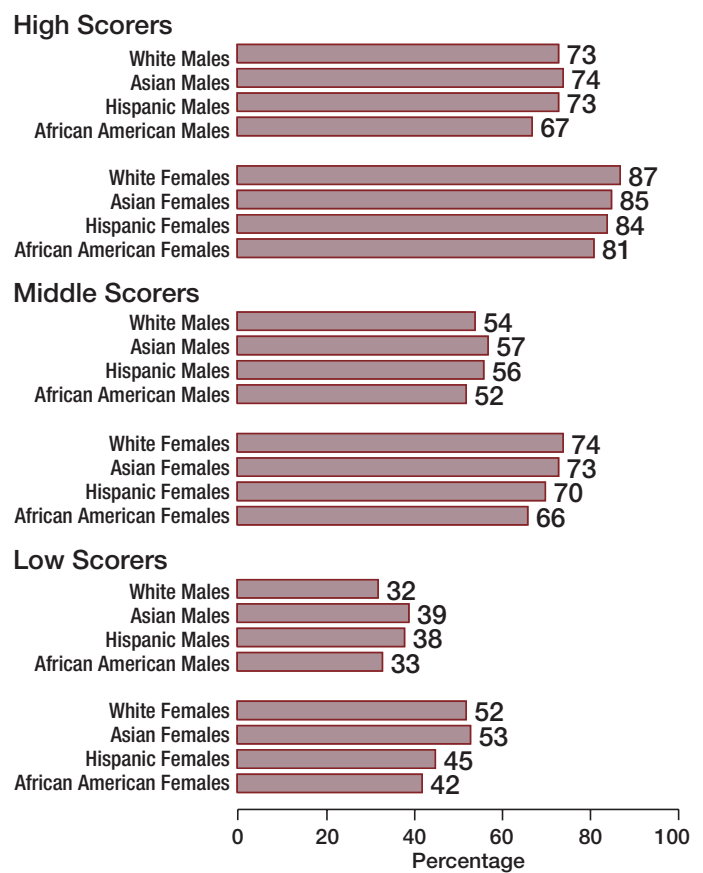


Figure 15

Percentage of SAT Test Takers Who Reported a GPA of "A" in Art and Music, by Score Level, Gender, and Racial/Ethnic Group

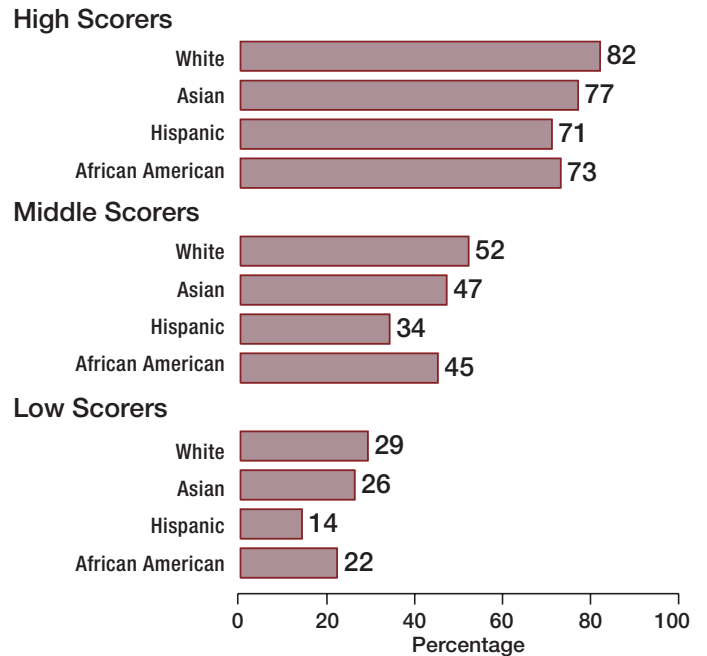


Parental Education

Figure 16 reflects the familiar relationship between SAT scores and parental education, with higher scores associated with better-educated parents. Within each score level, White students were more likely than those in other racial/ethnic groups to have at least one parent with a college degree. Nevertheless, a college-educated parent is not a necessary condition for high SAT scores, as over a quarter of high-scoring African American and Hispanic students indicate that neither parent has a college degree.

Figure 16

Percentage of SAT Test Takers Having a Parent with a Bachelor's Degree or Higher, by Score Level and Racial/Ethnic Group



SAT Scores of Students with Outstanding High School Records

In the previous sections, we examined course taking and other characteristics of minority and White students with high SAT scores. In this section, we turn the question around to look at SAT scores of students with outstanding academic records. We use the same sample of students from the group of 2001 college-bound seniors.

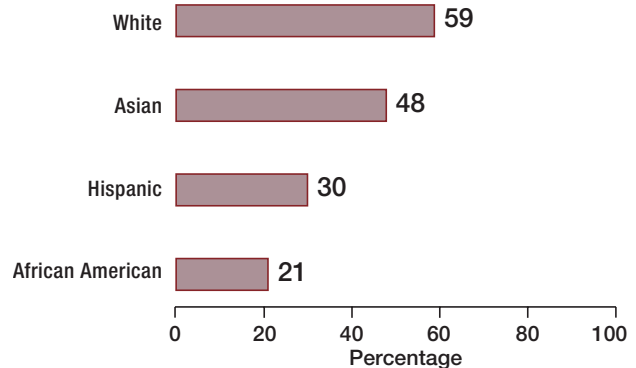
We define an outstanding record as taking and succeeding in demanding courses, being an officer or receiving an award in a school activity, and succeeding in Advanced Placement courses. We start with the nearly one million college-bound seniors from four racial/ethnic groups (Asian American, African American, Hispanic, and White). Rather than focusing on mean SAT performance, which hides the number of students performing below the mean, we focus on the percentage of the students in each group who score 510 or higher. This number is close to the national SAT means of 506 in verbal and 514 in math for 2001.¹¹ More importantly, scoring at or above 510 places a student in the mid-range of SAT scores for incoming freshmen at hundreds of colleges and universities, including many major state universities.¹²

Figure 17 presents the percentage of students in each group scoring over 500 on the SAT-Verbal (note that “over 500” means 510 or higher because the last digit of SAT scores is always 0). This reflects the familiar broad gap among racial/ethnic groups. Well over half of the White students have SAT-Verbal scores over 500, while fewer than 25 percent of African American students score in this range.

Racial/ethnic groups differ in terms of average academic preparation in high school, and no statistical adjustments can make them equivalent. But we can look at score differences among examinees who have had more similar academic backgrounds. First, we consider only students who have taken a demanding set of courses, which we define as including at least two years of one foreign language, an advanced

Figure 17

Percentage of SAT Test Takers with Verbal Scores Over 500, by Racial/Ethnic Group



math course (trigonometry or precalculus), and physics. Opportunity to learn is not an issue here because virtually all high schools offer these courses, although we recognize that the quality of these courses can vary substantially among different high schools.

The first set of bars in Figure 18 repeats Figure 17 for comparison, and the next set of bars reflects only those students who took demanding courses. Over 40 percent of the African American students and nearly 50 percent of Hispanic students who took this set of demanding courses scored over 500 on the SAT. By looking only at students who took demanding courses, the percentage of African American students scoring over 500 doubles.

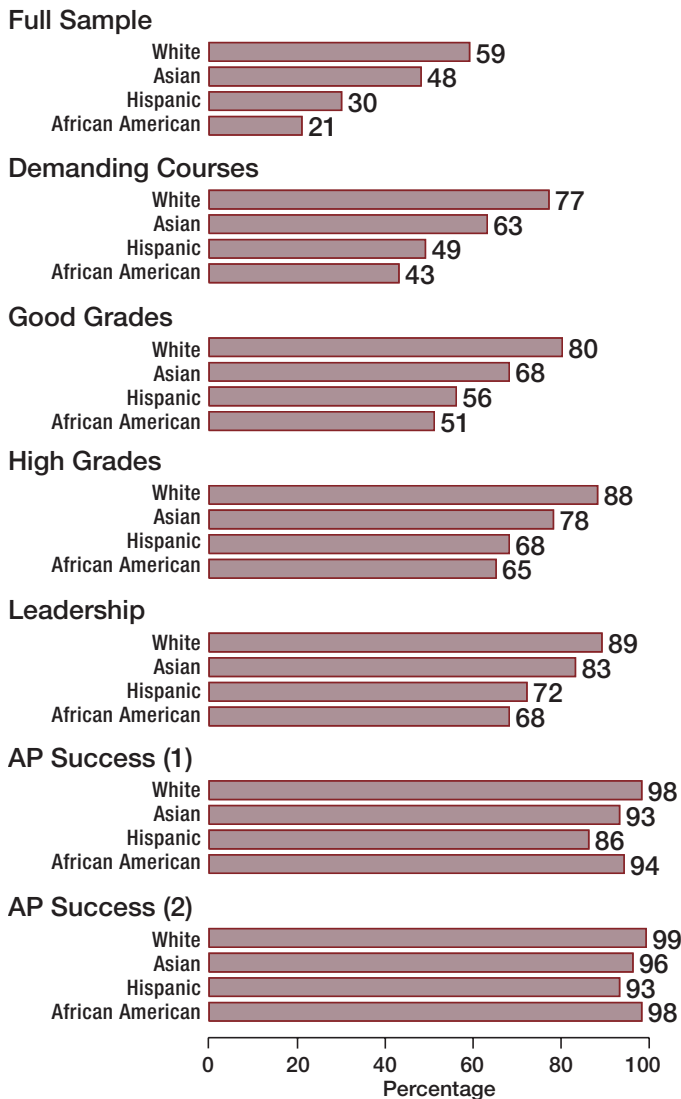
The next set of bars adds the condition that the students got good grades (defined as an A or a B) in a set of core courses including English, math, natural science, and social science and history. Note that these results are cumulative, such that students in the third set of bars took demanding courses AND got good grades. Now over half of African American students had SAT-Verbal scores over 500. Nevertheless, a racial/ethnic gap still remains, as 80 percent of White examinees in this group had scores over 500.

¹¹ College Board data. See: <http://www.collegeboard.com/sat/cbsenior/yr2001/pdf/NATL.pdf>

¹² For example, a verbal score of 510 would place a student in the mid-range (i.e., 25th to 75th percentile of incoming freshmen) at University of California—Davis, University of Connecticut, University of Kentucky, University of Massachusetts, University of Oregon, and University of South Carolina, to name just a few.

Figure 18

Percentage of SAT Test Takers with Verbal Scores Over 500, by Increasing Levels of Academic Accomplishment, by Racial/Ethnic Group



The next step demands not just good grades, but high grades, defined as an A in at least three out of the four core academic areas. Regardless of racial/ethnic group, most students who reach this level of academic success in high school also do well on the SAT. But, it is also apparent that taking demanding courses and getting high grades in core subjects is no guarantee of high SAT scores, as over 30 percent of the African American and Hispanic students at this level have SAT scores of 500 or lower. We cannot determine the quality of these high school courses, and it may be possible to get high grades in some high schools without mastering the content to the same degree needed to get a high grade at a more competitive high school. Furthermore, even if the courses were equivalent, other factors in the community, school, or home environments might contribute to the relatively lower scores in these groups. Additional research is needed to determine the extent to which differences in course content, quality, and standards might play a role in the observed score differences.

Continuing to refine the criteria for identifying outstanding students, we next add a requirement that the student excelled in a school activity to the extent of being an officer or receiving an award. Participation and leadership in activities is a key ingredient for success in college broadly defined, but does not have much relationship with purely academic indicators.¹³ This is reflected in Figure 18 by the small change in the SAT percentages as this indicator is added.

¹³ W. W. Willingham, *Success in College: The Role of Personal Qualities and Academic Ability*. New York: College Entrance Examination Board, 1985.

The next step includes all of the criteria for the previous steps and adds the requirement of succeeding in an Advanced Placement (AP) course. We define success in these courses as receiving a grade of 3 or higher on the AP examination. This is the grade recommended as qualifying a student for college credit, though a number of colleges set more stringent requirements. As indicated in Figure 18, nearly all students who succeed in these courses also score over 500 on the SAT-Verbal. With nearly all students scoring over 500, the proportions succeeding across racial/ethnic groups are necessarily equalized. The final step, requiring success in two AP courses, brings the proportion scoring over 500 to over 90 percent in all groups.

This type of analysis cannot identify underlying causes. Nevertheless, these data do not need to remain silent on all causal claims. Thus, a causal statement such as “minority students cannot get above-average scores on the SAT because it is biased” is clearly contradicted by these analyses, which indicate that above-average SAT scores are within reach of good students regardless of racial/ethnic group.

Figure 19 presents comparable information for SAT-Math. Results mirror those for SAT-Verbal with a few minor exceptions. At all levels of academic success, the SAT-Math scores of the Asian American group are slightly ahead of the White group (except for the final step of success in two AP courses, where 99 percent of both groups score over 500). At the high grades step, over half of African American students and almost 70 percent of Hispanic students receive SAT-Math scores over 500.

Figure 19

Percentage of SAT Test Takers with Mathematics Scores Over 500, by Increasing Levels of Academic Accomplishment, by Racial/Ethnic Group

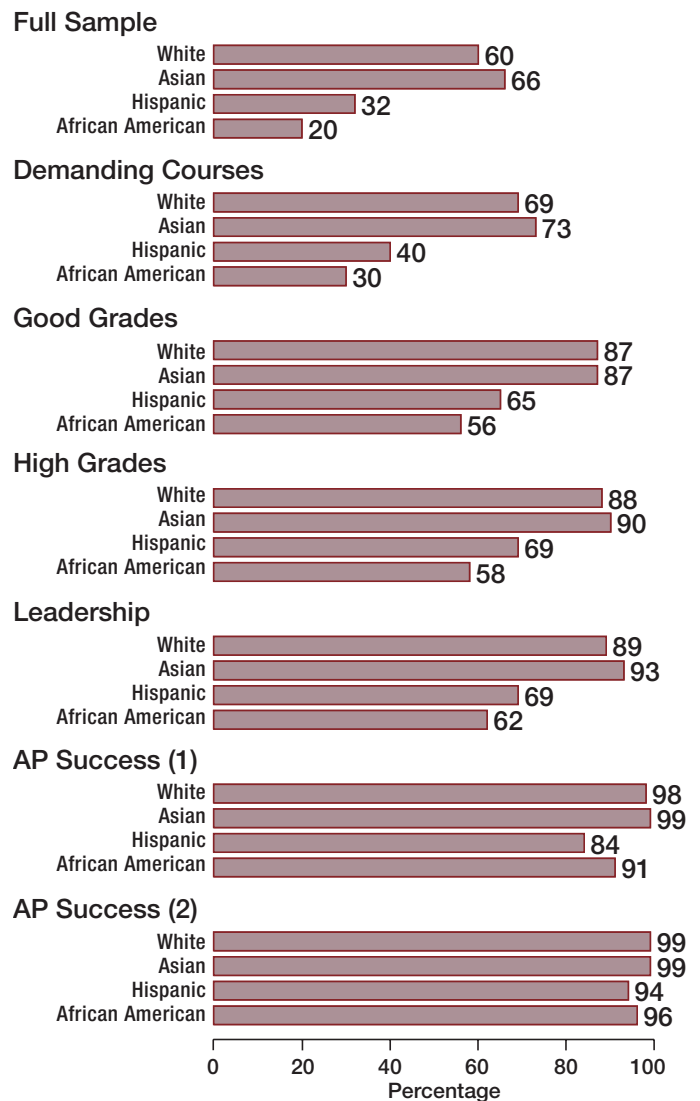


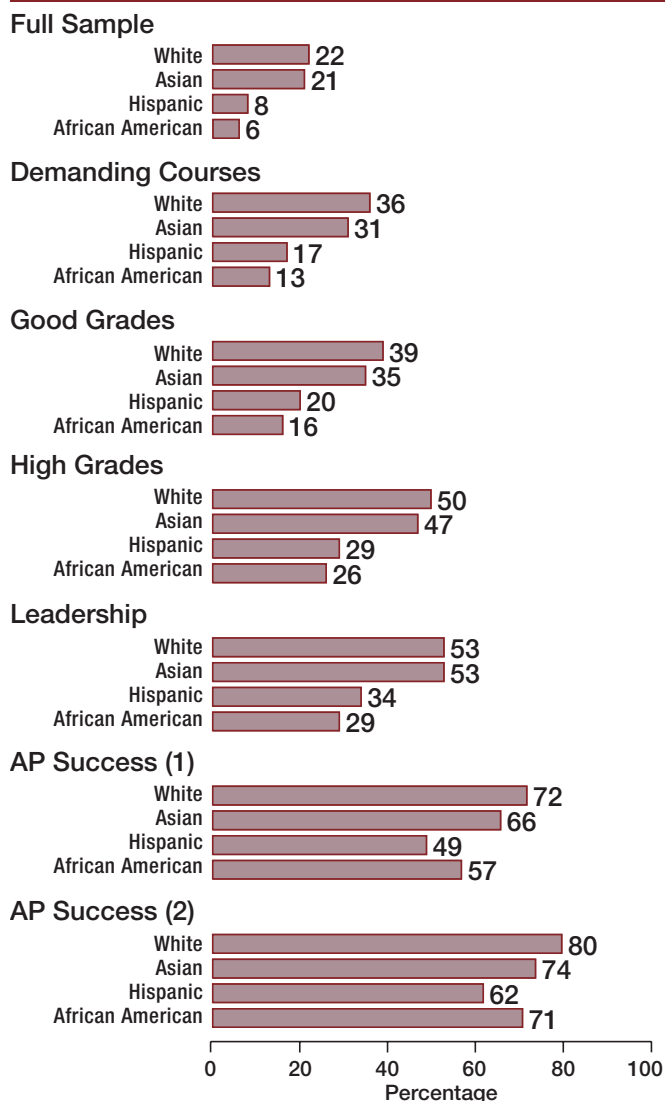
Figure 20 presents SAT-Verbal information that is comparable to Figure 18, except that it shows the percentage of students in each group with SAT-Verbal scores over 600 (i.e., 610-800). Students at this level are scoring higher than 80 percent of the students who took the test.

General trends are the same as seen for the group scoring over 500; with each step, the percentage of students scoring over 600 increases in each racial/ethnic group. However, the gap between groups does not begin to narrow before the AP success step, and even then a considerable gap remains, especially for the Hispanic group.

Figure 21 replicates Figure 20 for the SAT-Math. Again, the percentage of students with SAT-Math scores in this high 600+ range increases with each step of academic achievement in high school, but even at the last step, the percentage of high scores in the Hispanic and African American groups is noticeably below the percentage in the White group. The reasons for the remaining gap have been the focus of considerable interest (e.g., a 523-page edited volume by Christopher Jencks and Meredith Phillips,¹⁴ a book by L. Scott Miller,¹⁵ a book chapter by Michael Nettles, Catherine Millett, and Douglas Ready,¹⁶ and a report from the ETS Policy Information Center¹⁷), but no definitive answers have been found. Ascribing the gap merely to test bias is unwarranted. Many factors could contribute to the gap (e.g., school quality, class size, hunger and nutrition, low birthweight, parental involvement, fear of “acting white”), and it is not yet clear which factors may be most relevant.

Figure 20

Percentage of SAT Test Takers with Verbal Scores Over 600, by Increasing Levels of Academic Accomplishment, by Racial/Ethnic Group



¹⁴ C. Jencks & M. Phillips (Eds.), *The Black-White Test Score Gap*. Washington, DC: Brookings Institution Press, 1998.

¹⁵ L.S. Miller, *An American Imperative: Accelerating Minority Educational Advancement*. New Haven: Yale University Press, 1995.

¹⁶ M.T. Nettles, C.M. Millett, & D. Ready, *Attacking the African American-White Achievement Gap on College Admissions Tests*, In D. Ravitch (Ed.), *Brookings Papers on Education Policy 2003* (pp. 215-252). Washington, DC: Brookings Institution Press, 2003.

¹⁷ Paul E. Barton, *Parsing the Achievement Gap: Baselines for Tracking Progress*, Policy Information Report. Princeton, NJ: Policy Information Center, Educational Testing Service, 2003.

Figures 18 through 21 show how academic success in high school and SAT scores relate to each other, but they represent only part of the story. The rest of the story describes how the numbers of students who have achieved these levels differ by racial/ethnic group. As shown in Figure 22, fewer than half of any group met our definition of taking demanding courses (two years of a foreign language, precalculus or trigonometry, and physics), and there were substantial differences among racial/ethnic groups. Recall that a limitation of this study is that these percentages are based on a self-selected population that chose to take the SAT for admission into colleges; these numbers would be substantially reduced in a full sample of high school seniors.

Figure 21

Percentage of SAT Test Takers with Mathematics Scores Over 600, by Increasing Levels of Academic Accomplishment, by Racial/Ethnic Group

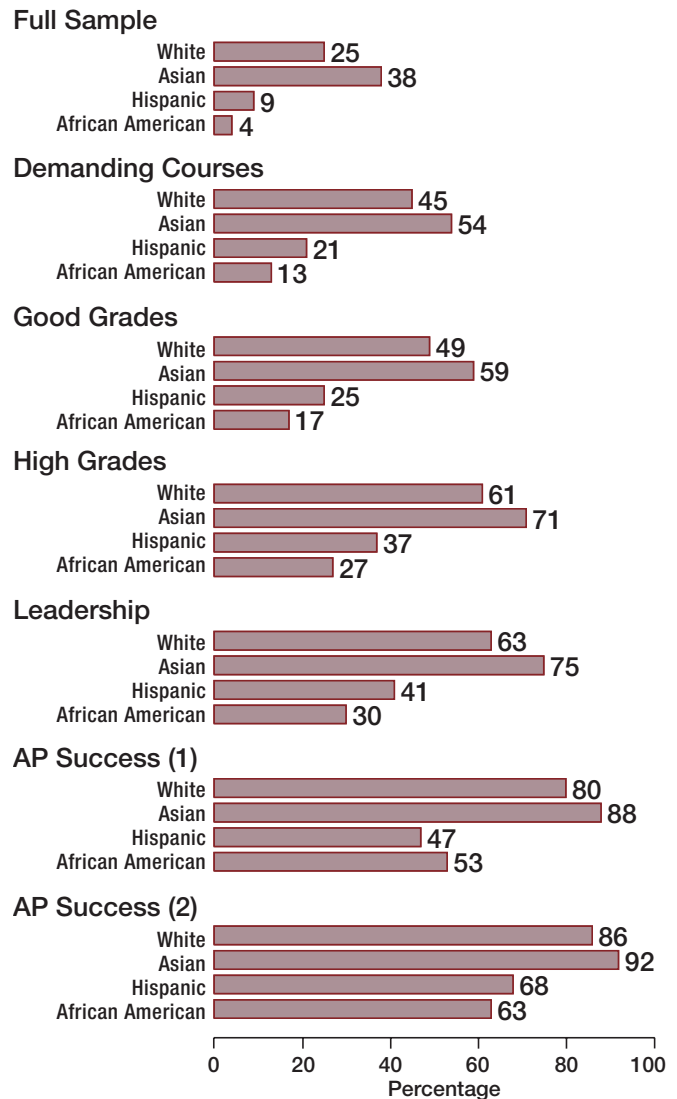
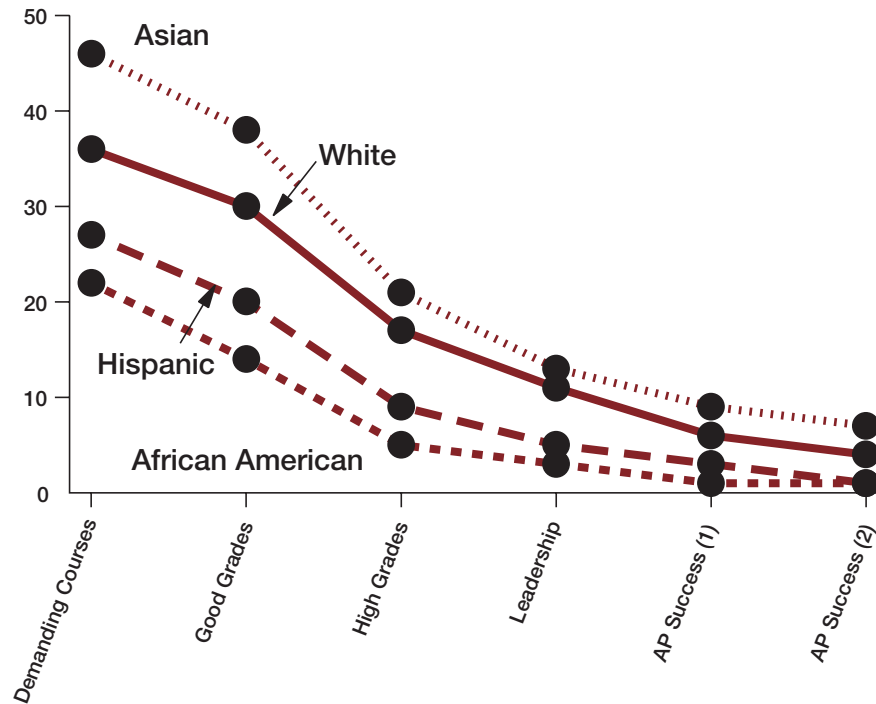


Figure 22

Percentage of SAT Test Takers at Increasing Levels of Academic Accomplishment, by Racial/Ethnic Group



The drop from “good grades” (all As and Bs in four core areas) to “high grades” (As in at least three out of four core areas) is significant, given concerns with grade inflation in high schools. Only half as many students got high grades as got good grades. This is consistent with the suggestion that some fears of grade inflation may be exaggerated,¹⁸ although it cannot entirely negate substantial evidence that grade inflation is real.¹⁹ Less than a quarter of any group is left at this step; only 5 percent of college-bound African American

students remain. Adding the officer/award step brings all groups under 15 percent, and the first AP success step brings all groups under 10 percent, with less than 1 percent of African American students remaining. Out of the original sample of 117,071 African American examinees (48,504 men and 68,567 women), the number remaining at this step is 1,401 (470 men and 931 women); for the last step of two AP successes, these numbers drop to 266 men and 575 women.

¹⁸ D. Koretz & M. Berends, *Changes in High School Grading Standards in Mathematics, 1982-1992*, Washington, DC: Rand Corporation, 2001. <http://www.rand.org/publications/MR/MR1445/>

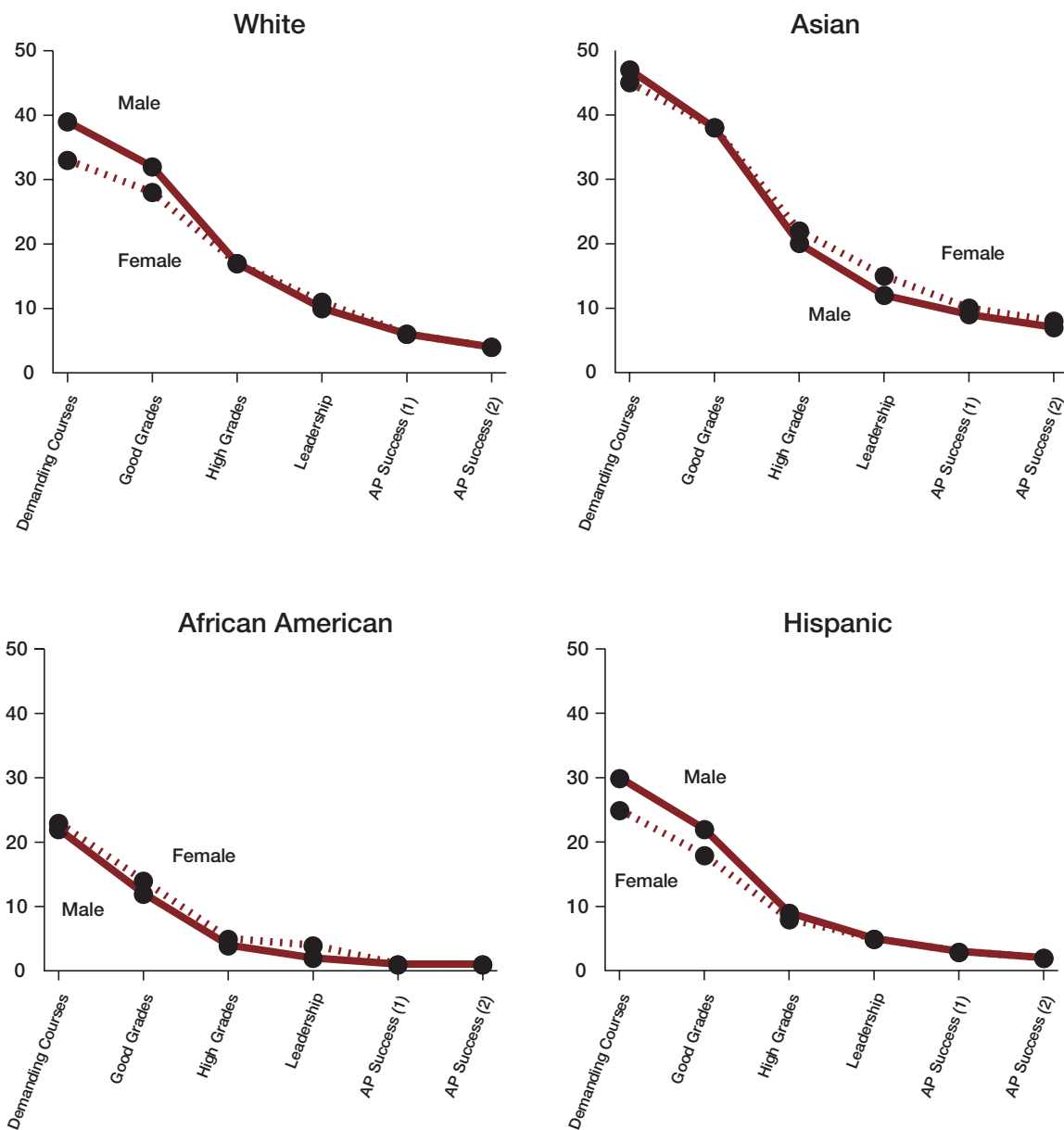
¹⁹ W. Camara, E. Kimmel, J. Scheuneman, & E. Sawtell, *Whose Grades Are Inflated?* (College Board Research Report No. 2003-4). New York: College Entrance Examination Board, 2003.

Figure 23 shows the gender breakdown within racial/ethnic groups. Among White and Hispanic students, males were slightly more likely than females to take demanding courses, probably because we used

physics as one of the defining variables in this category. By the third step of high grades, the percentages of males and females are virtually identical within each racial/ethnic group.

Figure 23

Percentage of SAT Test Takers at Increasing Levels of Academic Accomplishment, by Racial/Ethnic Group and Gender



Characteristics of the Academic Superstars

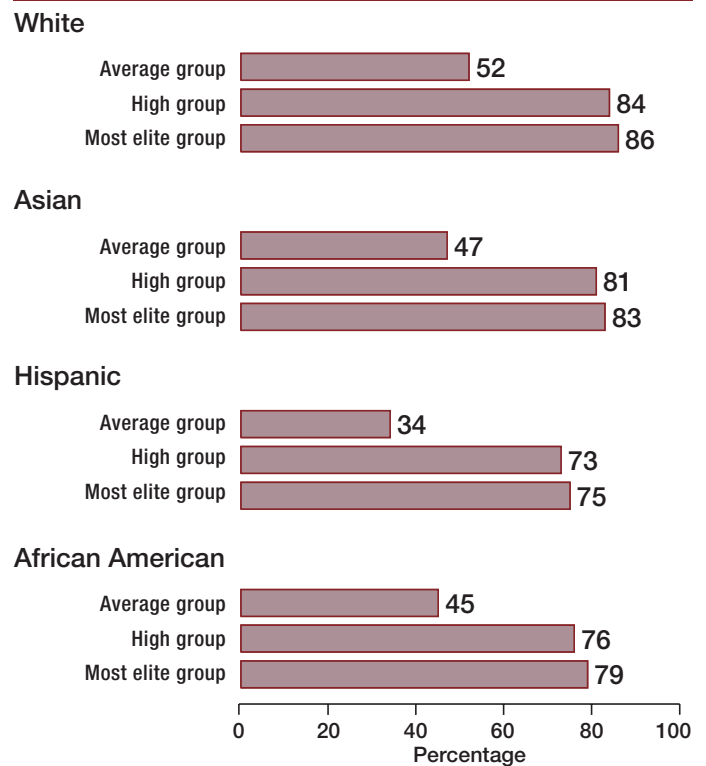
In this final section, we focus on the characteristics of the academic superstars—students who excelled both in demanding high school courses and on the SAT. These students had SAT scores over 1300 and reached at least the “high grades” level (i.e., demanding courses, no grade lower than a B in the four core course categories, and at least three out of four A grades). An even higher “elite” level adds to the above criteria at least one leadership role (officer or award) in an extra-curricular activity and a 3 or higher on at least one AP test.

Parental education. The academic environment in the home is determined to some degree by the educational level of the parents. Figure 24 shows the proportion in each group with at least one parent with a bachelor’s degree. For comparison, we include a group with average SAT scores (1000-1050) in addition to the two academic superstars levels. Across racial/ethnic groups, most of the highly successful students have at least one parent with a college degree. But, as we noted when students were sorted only on SAT scores, a college-educated parent is not a necessary condition for being among the academic superstars. Over 20 percent of the highly successful Hispanic and African American students did not have a parent with a college degree.

College aspirations. Finally, we focus on the first choice of college major as indicated by the student on the SAT Questionnaire. Although many students change majors after beginning college, these pre-college choices provide a window into students’ perceptions of fields that are seen as desirable and attainable. We define three achievement groups: the high group consists of students who attained at least a 1300 combined score on the SAT, had no grade below B in the four core areas, and had at least 3 As in the core areas; the middle group consists of students whose SAT scores were in the 1000 to 1050 range; and the low group contains students with combined SAT scores of 760 or lower.

Figure 24

Percentage of SAT Test Takers with at Least One Parent Who Is a College Graduate, by Racial/Ethnic Group and Level of Academic Accomplishment



Average group has SAT scores in the 1000 to 1050 range
 High group has SAT scores over 1300 and high grades
 Most elite group has SAT scores over 1300, high grades, leadership activities, and AP Success

Table 2**Percentage of Students in Each Group Selecting Each College Major**

| Achievement Group | Racial/Ethnic Group | Gender | Number | College Major | | | | | | | | | | | |
|-------------------|---------------------|--------|--------|---------------|--------------------|---------|----------|----------------|------------------|------------------|-------------------|----------------|--------------------|---------|-----------|
| | | | | Engineering | Biological Science | Pre-Med | Business | Social Science | Computer Science | Physical Science | Visual/Perf. Arts | Communications | Health Professions | Pre-Law | Education |
| High | White | M | 21,223 | 24 | 6 | 6 | 9 | 6 | 11 | 6 | 3 | 5 | 2 | 3 | 1 |
| | | F | 17,556 | 8 | 12 | 9 | 6 | 10 | 2 | 4 | 6 | 3 | 5 | 3 | 5 |
| | Asian Am. | M | 3,819 | 24 | 9 | 16 | 11 | 3 | 17 | 3 | 1 | 1 | 2 | 2 | 0 |
| | | F | 3,700 | 10 | 13 | 22 | 11 | 5 | 5 | 2 | 3 | 2 | 5 | 3 | 1 |
| | Hispanic | M | 812 | 27 | 8 | 9 | 9 | 6 | 8 | 5 | 3 | 2 | 2 | 4 | 1 |
| | | F | 581 | 11 | 13 | 13 | 7 | 11 | 1 | 4 | 6 | 3 | 4 | 3 | 2 |
| African Am. | M | 309 | 25 | 9 | 13 | 11 | 5 | 10 | 4 | 9 | 2 | 2 | 4 | 0 | |
| | F | 350 | 13 | 13 | 20 | 8 | 10 | 3 | 3 | 4 | 3 | 2 | 4 | 2 | |
| Middle | White | M | 37,649 | 11 | 3 | 2 | 16 | 5 | 9 | 1 | 7 | 4 | 5 | 2 | 5 |
| | | F | 48,581 | 1 | 5 | 4 | 10 | 9 | 1 | 1 | 9 | 6 | 14 | 2 | 16 |
| | Asian Am. | M | 4,000 | 18 | 4 | 4 | 15 | 2 | 23 | 1 | 6 | 2 | 6 | 1 | 1 |
| | | F | 4,486 | 4 | 6 | 9 | 16 | 7 | 7 | 1 | 9 | 5 | 14 | 2 | 5 |
| | Hispanic | M | 4,379 | 16 | 4 | 5 | 14 | 5 | 11 | 1 | 7 | 3 | 6 | 3 | 3 |
| | | F | 5,245 | 4 | 6 | 10 | 13 | 11 | 2 | 1 | 8 | 5 | 12 | 4 | 9 |
| African Am. | M | 3,984 | 18 | 3 | 4 | 18 | 5 | 14 | 1 | 6 | 3 | 6 | 3 | 3 | |
| | F | 5,211 | 5 | 6 | 12 | 14 | 12 | 4 | 1 | 5 | 6 | 12 | 6 | 6 | |
| Low | White | M | 13,927 | 6 | 2 | 0 | 13 | 3 | 8 | 1 | 6 | 3 | 5 | 1 | 7 |
| | | F | 21,611 | 0 | 3 | 1 | 10 | 6 | 2 | 0 | 8 | 2 | 19 | 1 | 19 |
| | Asian Am. | M | 3,276 | 15 | 2 | 1 | 13 | 2 | 24 | 0 | 6 | 1 | 6 | 0 | 2 |
| | | F | 4,870 | 3 | 3 | 3 | 18 | 4 | 10 | 1 | 8 | 2 | 20 | 1 | 7 |
| | Hispanic | M | 7,633 | 13 | 2 | 1 | 13 | 4 | 11 | 1 | 7 | 2 | 6 | 1 | 5 |
| | | F | 13,648 | 2 | 3 | 4 | 13 | 9 | 4 | 0 | 7 | 3 | 17 | 2 | 12 |
| African Am. | M | 14,609 | 11 | 2 | 1 | 17 | 3 | 13 | 0 | 7 | 4 | 6 | 1 | 6 | |
| | F | 21,687 | 2 | 2 | 5 | 13 | 9 | 6 | 0 | 5 | 3 | 22 | 3 | 8 | |

Table 2 shows the percentage of students in each achievement group by gender within racial/ethnic group who indicated that the given field was their first choice for a college major. The 12 fields selected most frequently are listed in order from most popular to least popular for students in the high achievement

group. Note that the order would be quite different for students in the low group. Health professions (which excludes pre-med) is the first choice among students in the low group but only tenth in the high group; business is second in the low group and fourth in the high group; and education is third in the low group and twelfth in the high group.

Engineering is the most popular choice of major among men in the high group, and there is practically no variation across the men in the four racial/ethnic groups. Engineering is a much less popular choice among women across racial/ethnic groups, although it is a somewhat more popular choice among African American women than among White women (13 percent vs. 8 percent). Biological science, on the other hand, is a more popular choice among women than among men, but once again racial/ethnic differences are quite small. Similarly, pre-med is a more common choice among women than among men, and is especially popular with Asian American and African American women. Combining biological science with its close cousin pre-med, shows that life sciences are a particularly popular choice among high-achieving minority women (35 percent of Asian American women, 26 percent of Hispanic women, and 26 percent of African American women). These fields are much less popular among low-achieving students, with no more than 7 percent of any group selecting the combined life sciences.

As a college major, business is about equally popular across racial/ethnic groups, though it is selected slightly more frequently by males than by females. Business is a somewhat more popular choice among students in the low and middle achievement groups than among students in the high group. Social science is chosen more frequently by women than by men. The pattern is similar across racial/ethnic groups, except that Asian American students of both genders are only half as likely to select this major as are students in the other racial/ethnic groups. Students in the low achievement group select social science as a major less frequently than do students in the high group. Computer science, on the other hand, is about equally popular across achievement groups, but is much more popular among men than women. It is the most popular choice among Asian American men in the middle

and low groups, and is second only to engineering for Asian American men in the high group. Contrary to the popular stereotype, physical sciences are selected less frequently by high-achieving Asian American students than by high-achieving students in any of the other racial/ethnic groups. Furthermore, males are only slightly more likely than females to select a major in this area. Physical sciences are a very unpopular choice for students in the middle- and low-ability groups.

Visual and performing arts, as well as communications, share a similar popularity across the three achievement levels. Health professions, on the other hand, are much more popular in the low and middle achievement levels than at the high level; across levels, two to three times as many women as men choose majors in the health professions. In the high group, pre-law is selected about as frequently as the health professions, but is selected much less frequently in the middle and low groups. The number selecting a pre-law major is probably an undercount of the number of students interested in a law career because students may select a major such as political science or international relations that would be counted in the social science category.

Relatively few high-achieving students, and especially high-achieving males, select education majors. Less than half a percent (rounding to 0 on the table) of Asian American and African American high-achieving men chose education majors. Out of the 3,819 Asian American men in the elite high-achieving group, only 13 expressed a desire to major in education. Out of 309 African American men in this group, exactly 1 indicated he wanted to major in education; of the 350 African American women, 7 selected education as their preferred major. Education is a much more popular major among the students in the lowest achievement group.

Conclusions

Regardless of racial/ethnic group, it is clear that students who excel in rigorous courses tend to get high SAT scores, and students who get high SAT scores tend to take and excel in rigorous courses. It seems likely that the causal connection is running in both directions simultaneously. Taking demanding courses may help students sharpen the reading and mathematical skills that are assessed by the SAT. At the same time, students cannot succeed in difficult courses if they lack strong reading and mathematical skills. Because of the ambiguity in the dominant causal direction, a reasonable approach would be to assume that both are at least partially correct. Students, regardless of racial/ethnic classification, should be encouraged to take rigorous courses. At the same time, work should continue on the myriad other potential causes of the achievement gap to ensure that all students have the skills needed to succeed in these demanding courses. (A report from the ETS Policy Information Center recently identified 14 factors that might contribute to the achievement gap, including school factors such as teacher preparation and class size, and factors before and beyond school such as birthweight, lead poisoning, and reading to young children.)²⁰

Our exploration has shown that differences do exist in parental education among students from different racial/ethnic subgroups, but we have also shown that many minority students without college-educated parents have taken rigorous courses and done well in them and on the SAT. Although engaging in rigorous courses during high school cannot guarantee eliminating score differences among groups of students, it will, nevertheless, help *all students* prepare for college success. This in itself is a worthwhile goal.

If students are to succeed academically in the rigorous courses that they should be taking, quality teachers are bound to play an important role. But the current results suggest that the “academic superstars” have almost no interest in teaching (or at least no interest in majoring in education). Finding the combination of economic and non-economic incentives to reverse this situation could play an important role in making sure that the next generation of academic superstars has highly qualified teachers, as well as helping to assure that no child is left behind.

²⁰ Barton, 2003.

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