
Postsecondary Course Performance of AP[®] Exam Takers in Subsequent Coursework

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Executive Summary

The Advanced Placement® (AP®) Program offers high school students the opportunity to take rigorous coursework in high school and receive college credit for AP Exam scores that meet or exceed the requirements of their attending institution. Students receiving AP credit are typically exempted from an introductory level course or series of courses and are typically able to take more advanced courses in the same subject area. In this study, we compare the subsequent course performance of AP Exam takers who placed out of an introductory college course to students who did not take the AP Exam and completed the introductory course at their respective institutions. Results indicate that AP Exam takers, on average, earn the same or statistically significant higher grades in subsequent courses within the same subject area than do students completing the equivalent introductory coursework at their institution. Results provide evidence that AP Exam scores are valid indicators for course credit and placement decisions. The AP Exams covered in this report are:

- AP Computer Science A
- AP Macroeconomics
- AP Microeconomics
- AP English Language and Composition
- AP English Literature and Composition
- AP Environmental Science
- AP United States Government and Politics
- AP Comparative Government and Politics
- AP Human Geography
- AP Music Theory
- AP Physics C: Mechanics
- AP Physics C: Electricity and Magnetism
- AP Psychology
- AP Statistics

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Introduction

The Advanced Placement® (AP®) Program offers high school students the opportunity to complete college-level coursework in 38 subjects and demonstrate proficiency by taking a nationally standardized exam at the conclusion of the course. AP Exam scores are criterion referenced¹ and range from 1 to 5. A score of 1 represents ‘No recommendation for college credit’; 2 represents ‘Possibly qualified for college credit’; 3 represents ‘Qualified for college credit’; 4 represents ‘Well-qualified for college credit’; and 5 represents ‘Extremely well-qualified for college credit’. The American Council on Education (ACE) recommends awarding college credit or placement into higher level courses to students scoring 3 or higher. In practice, AP policies vary as the AP score required for credit or placement often differs by institution. The purpose of this study is to compare the subsequent course performance of AP Exam takers who placed out of an introductory college course to students not taking the AP Exam who first took the equivalent introductory course(s) as matriculated college students². For AP Exam takers, the subsequent course will be the first course taken on campus in the same subject area of the AP Exam. For those not taking the AP Exam, the subsequent course is the first course taken following the introductory course(s) for which the AP Exam takers received credit. Specifically, the primary research question is:

How do AP Exam takers who received credit at an institution perform in the next course taken compared to students who didn't take the AP Exam but took the corresponding introductory course(s) at their institution?

In this report we compare students who took an AP Exam to students who did not take an AP Exam. While non-AP Exam takers did not take the AP Exam in the particular subject under study, they may have taken the corresponding AP course (or a similar advanced course) while in high school.

Data and Sample

Students in this sample were entering freshman in fall 2009, and attended one of the 93 four-year postsecondary institutions that participated in the National SAT Validity study³. These institutions must have participated in the study for four academic years from 2009 to 2013 and students must have attended one of these institutions for at least one academic year. The sample was further restricted to institutions providing written guidelines on AP

¹ Criterion-referenced tests measure student performance against predetermined criteria.

² Because the primary purpose of this research is to understand the utility of AP Exam scores in making course placement decisions, control variables that may be used in other research to isolate the impact of AP participation on college success measures such as gender, ethnicity, parental income, etc., are not used as these variables are not considered when course placement decisions are made.

³ For more information see: <http://files.eric.ed.gov/fulltext/ED563103.pdf>

credit and placement policies. The number of institutions included in the analysis by AP subject is presented in Table 1.

Method

In this study, the performance of students who took an AP Exam and were exempted from an introductory course on campus is compared to the performance of students who did not take the AP Exam and did take the introductory course on campus. Performance was measured by the grade earned in the subsequent course(s) taken in the same subject area (e.g., U.S. History). For AP Exam takers, this represented the first course(s) taken in the same subject area of the AP Exam on campus and for students who did not take the AP Exam, it represents the first course(s) taken following the introductory course for which the AP students received credit. If two or more courses were taken simultaneously, an average of grades is used to measure performance.

For each analysis, there were six groups of students: three AP groups and three non-AP comparison groups. The AP groups were divided into students who scored 3 on the AP Exam, students who scored 4 on the AP Exam, and students who scored 5 on the AP Exam. To be included in the AP groups, AP Exam takers eligible for placement could not have taken the equivalent introductory course(s) on campus and must have completed a subsequent course(s) in the same subject. To be included in the non-AP groups, students must not have taken the AP Exam, and must have completed the introductory course on campus as well as a subsequent course(s) in the same subject. While AP Exam takers can appear in only one group, students who did not take the AP Exam could appear in multiple groups. The three non-AP groups are divided into those students who participated in courses at the institution that were considered equivalent⁴ to the course(s) for which students would earn credit if scoring a 3 on the AP Exam; students who participated in courses at the institution that were considered equivalent to the course(s) for which students would earn credit if scoring a 4 on the AP Exam; and students who participated in courses at the institution⁵ that were considered equivalent to the course(s) for which students would earn credit if scoring a 5 on the AP Exam. For example, consider an institution that lists Statistics 100 as the AP equivalent course for AP Statistics scores of 3, 4, or 5. Students who did not take the AP Statistics Exam but did take Statistics 100 as well as a subsequent statistics course would be the appropriate comparison group for all AP students scoring a 3, 4, or 5 and would appear in all three non-AP comparison groups. More information on identifying AP and non-AP student groups is provided in Appendix A.

Once the AP and non-AP samples were created, a series of regressions was conducted to compare the AP and non-AP groups: The AP 3 group was compared to the non-AP 3 group,

⁴ An equivalent course is one for which an AP student receives credit and/or placement per their institution's policy.

⁵ While decisions on group membership were made based on the policies at the attending institution, results were calculated using all of the participating institutions.

the AP 4 group was compared to the non-AP 4 group, and the AP 5 group was compared to the non-AP 5 group. In each regression the outcome was the grade earned in the subsequent course and the predictor was a dichotomous variable representing AP group membership (0, 1).

Results

Table 1 shows the number of institutions included in the analysis of each AP Exam subject. We additionally disaggregate that number by the minimum AP score accepted. The number of institutions range from 15 in Music Theory to 49 in U.S. Government. An AP score of 3 was most often the minimum score needed to receive credit or placement. The exceptions

Table 1: Summary of Institutional AP Credit- and Placement-Granting Policies

| AP Exam | Number of Institutions Granting Credit/ Placement for an AP Exam Score of: | | | Total Institutions |
|--|--|-------------|---|--------------------|
| | 3 or Higher | 4 or Higher | 5 | |
| AP Computer Science A | 12 | 12 | 0 | 24 |
| AP Macroeconomics | 23 | 20 | 0 | 43 |
| AP Microeconomics | 23 | 19 | 1 | 43 |
| AP English Language and Composition | 23 | 15 | 0 | 38 |
| AP English Literature and Composition | 21 | 12 | 0 | 33 |
| AP Environmental Science | 16 | 11 | 1 | 28 |
| AP United States Government and Politics | 30 | 18 | 1 | 49 |
| AP Comparative Government and Politics | 15 | 10 | 2 | 27 |
| AP Human Geography | 13 | 4 | 0 | 17 |
| AP Music Theory | 8 | 5 | 2 | 15 |
| AP Physics C: Mechanics | 10 | 17 | 1 | 38 |
| AP Physics C: Electricity and Magnetism | 8 | 16 | 3 | 27 |
| AP Psychology | 24 | 18 | 5 | 47 |
| AP Statistics | 30 | 19 | 0 | 48 |

Note: Institutions accepting scores lower than 3 for credit and placement are not reported here and were not considered in our study. All institutions that accept AP scores of 3 for credit and placement also accept scores of 4 and 5, and all schools that accept scores of 4 also accept scores of 5.

Table 2: Summary of Institutional Characteristics

| Institutional Characteristic | | Percent | | | | | | | | | | | | | |
|------------------------------|--------------|-----------------------|-----------------------|-----------------------|---------------------|--------------------|--------------------|-----------------------|-----------------------|---------------------|-------------------------|----------------------|---------------------|---------------|---------------|
| | | Comp Sci A (24) | Econ Macro (43) | Econ Micro (43) | Eng Lang (38) | Eng Lit (33) | Env Sci (28) | Gov't U.S. (49) | Comp Gov't (27) | Hum Geog (17) | Music Theory (15) | Phys Mech (38) | Phys E&M (27) | Psych (47) | Stats (48) |
| U.S. Region | Midwest | 21 | 19 | 21 | 21 | 15 | 14 | 20 | 26 | 24 | 20 | 11 | 15 | 17 | 10 |
| | Mid-Atlantic | 13 | 12 | 14 | 8 | 15 | 14 | 12 | 15 | 18 | 13 | 18 | 15 | 13 | 16 |
| | New England | 13 | 14 | 16 | 11 | 9 | 11 | 14 | 7 | 6 | 13 | 14 | 15 | 15 | 14 |
| | South | 29 | 19 | 19 | 24 | 24 | 25 | 18 | 33 | 24 | 33 | 29 | 30 | 19 | 18 |
| | Southwest | 17 | 19 | 16 | 24 | 27 | 18 | 18 | 4 | 18 | 13 | 18 | 15 | 17 | 20 |
| | West | 8 | 19 | 14 | 13 | 9 | 18 | 16 | 15 | 12 | 7 | 11 | 11 | 19 | 20 |
| Control | Public | 54 | 56 | 53 | 61 | 67 | 64 | 53 | 63 | 76 | 53 | 46 | 52 | 51 | 51 |
| | Private | 46 | 44 | 47 | 39 | 33 | 36 | 47 | 37 | 24 | 47 | 54 | 48 | 49 | 49 |
| Admittance Rate | Under 50 | 17 | 16 | 21 | 11 | 9 | 21 | 18 | 11 | 0 | 20 | 29 | 33 | 19 | 16 |
| | 50 to 75 | 71 | 70 | 70 | 63 | 67 | 54 | 63 | 78 | 82 | 60 | 64 | 63 | 64 | 63 |
| | Over 75 | 13 | 14 | 9 | 26 | 24 | 25 | 18 | 11 | 18 | 20 | 7 | 4 | 17 | 20 |
| Undergraduate Enrollment | Small | 0 | 7 | 2 | 8 | 6 | 4 | 10 | 4 | 6 | 13 | 0 | 0 | 9 | 8 |
| | Medium | 29 | 30 | 35 | 29 | 24 | 21 | 31 | 26 | 12 | 33 | 43 | 41 | 32 | 31 |
| | Large | 29 | 19 | 19 | 26 | 27 | 21 | 22 | 22 | 12 | 7 | 14 | 11 | 23 | 22 |
| | Very Large | 42 | 44 | 44 | 37 | 42 | 54 | 37 | 48 | 71 | 47 | 43 | 48 | 36 | 39 |

Note: Institutional Characteristics (U.S. Region, Control, Admittance Rate, and Undergraduate Enrollment) are provided in percent.

were in Physics: Mechanics and Physics: Electricity and Magnetism where an AP score of 4 was most often the minimum score required for credit or placement. Computer Science A was split, as half of the institutions had a minimum AP score of 3 and half had a minimum AP score of 4.

Table 2 displays the characteristics of the postsecondary institutions in each sample. Descriptive statistics are included for region, control, selectivity, and size. Descriptive characteristics at the student level by AP Exam are provided in Appendix B.

Table 3 shows the number of students in each of the AP and non-AP groups as well as the mean subsequent course grades for the non-AP groups and the difference between the AP group mean and non-AP group mean. The number of students included in each analysis varies considerably, with Computer Science A having some of the smallest sample sizes (e.g., non-AP 3 = 483 and AP 3 = 42) and English Language having some of the largest samples (e.g., non-AP 3 = 19,773 and AP 3 = 3,716). The popularity of the subject and the number of institutions with explicitly stated AP credit and placement policies are among the primary determinants of sample size. For all subjects, the number of students in the non-AP groups is considerably larger than the number of students in the AP groups.

The course means also vary by subject: The mean grades for the non-AP groups range from 2.77 in Physics C: Mechanics to 3.37 in Music Theory. In all subjects, the AP Exam takers performed the same or better than their respective non-AP comparison group, suggesting that AP Exam scores are valid indicators of adequate preparation for subsequent coursework when applied in accordance with institutional policies. Although not all differences were statistically significant, students earning a 3 on the AP Exam outperformed their non-AP comparison group anywhere from 0.12 in Psychology to 0.57 in Physics C: Electricity and Magnetism, whereas the students scoring a 4 on the AP Exam outperformed their non-AP comparison group anywhere from 0.14 in Psychology to 0.48 in English Literature and U.S. Government and Politics, and students scoring a 5 on the AP Exam outperformed their non-AP comparison group anywhere from 0.28 in Music Theory to 0.74 in English Literature. As expected, within subject, the smallest differential is typically between the students scoring a 3 on the AP Exam and their non-AP comparison group whereas the largest differential is between the students scoring a 5 on the AP Exam and their non-AP comparison group. Regardless of AP Exam score, all AP Exam takers, on average, performed just as well if not better than non-AP Exam takers who took the introductory college course on campus.

**Table 3: Performance Differences in Course(s) Following an Equivalent Course:
AP Students Compared to Non-AP Students**

| AP Exam | | Course Participation and Means | | | Average Course Performance Differences: AP Students Minus Non-AP Students | | |
|----------------------------------|----------|--------------------------------|----------|----------|---|-------|-------|
| | | Non-AP 3 | Non-AP 4 | Non-AP 5 | AP 3 | AP 4 | AP 5 |
| | | | | | | | |
| Computer Science A | Mean | 3.00 | 2.90 | 2.90 | 0.24 | 0.32* | 0.52* |
| | <i>N</i> | 483 | 1,101 | 1,093 | 42 | 207 | 222 |
| Macroeconomics | Mean | 2.94 | 2.97 | 2.97 | 0.34* | 0.30* | 0.57* |
| | <i>N</i> | 5,027 | 9,996 | 9,996 | 183 | 846 | 521 |
| Microeconomics | Mean | 2.91 | 2.92 | 2.92 | 0.28* | 0.41* | 0.66* |
| | <i>N</i> | 8,657 | 18,247 | 18,484 | 198 | 536 | 328 |
| English Language | Mean | 3.15 | 3.16 | 3.11 | 0.27* | 0.37* | 0.60* |
| | <i>N</i> | 19,773 | 21,480 | 16,634 | 3,716 | 2,786 | 1,104 |
| English Literature | Mean | 3.05 | 3.08 | 3.00 | 0.39* | 0.48* | 0.74* |
| | <i>N</i> | 14,953 | 11,614 | 8,421 | 3,529 | 3,075 | 864 |
| Gov't & Politics: Comparative | Mean | 3.10 | 3.09 | 3.10 | 0.12 | 0.29* | 0.31* |
| | <i>N</i> | 961 | 1,614 | 1,821 | 45 | 63 | 78 |
| Gov't & Politics: U.S. | Mean | 2.83 | 2.87 | 2.87 | 0.29* | 0.48* | 0.69* |
| | <i>N</i> | 5,796 | 7,159 | 6,991 | 1,132 | 1,114 | 909 |
| Environmental Science | Mean | 2.95 | 3.01 | 3.01 | 0.23* | 0.30* | 0.58* |
| | <i>N</i> | 1,489 | 1,853 | 2,006 | 220 | 404 | 190 |
| Human Geography | Mean | 2.94 | 2.95 | 2.91 | 0.30* | 0.36* | 0.63* |
| | <i>N</i> | 508 | 637 | 525 | 66 | 77 | 58 |
| Music Theory | Mean | 2.82 | 3.07 | 3.37 | 0.34 | 0.40 | 0.28* |
| | <i>N</i> | 118 | 223 | 227 | 34 | 30 | 53 |
| Physics C: Mechanics | Mean | 2.77 | 2.84 | 2.83 | 0.33* | 0.32* | 0.61* |
| | <i>N</i> | 3,805 | 6,393 | 7,762 | 62 | 282 | 500 |
| Physics C: E&M | Mean | 2.87 | 2.97 | 2.92 | 0.57 | 0.31* | 0.61* |
| | <i>N</i> | 1,633 | 3,264 | 4,443 | 10 | 128 | 268 |
| Psychology | Mean | 3.12 | 3.12 | 3.13 | 0.12* | 0.14* | 0.40* |
| | <i>N</i> | 7,000 | 12,572 | 14,408 | 287 | 901 | 1,456 |
| Statistics | Mean | 3.11 | 3.06 | 3.06 | 0.25* | 0.41* | 0.60* |
| | <i>N</i> | 1,859 | 3,255 | 3,204 | 698 | 1,146 | 686 |

* P < .05

Appendix A

Identifying Equivalent Courses

AP equivalent courses were identified using a College Board database of AP policies at postsecondary institutions in 2009. An AP equivalent course is one for which an AP student receives credit and/or placement as per the policy at their institution. We excluded institutions from the study if the courses for which AP credit is awarded are not explicitly stated or if elective credit is awarded. Institutions that awarded course credit for AP Exam scores less than or equal to 2 were excluded from the study.

Identifying AP Exam Takers and Subsequent Coursework

Students

To be included in one of the AP groups students must have taken the AP Exam and obtained a score greater than or equal to the minimum score required for credit or placement at their postsecondary institution. Students must also attend an institution that has at least one non-AP student and must not have repeated an equivalent course(s) at their institution.

Subsequent Course Identification

This subsequent course is the first course(s) taken in the subject area of the AP Exam at the students' campus. If multiple courses in the same subject area of the AP Exam were taken in the same term, then a weighted average was calculated and used as the subsequent course grade. A more advanced equivalent course can serve as a subsequent course for a less advanced equivalent course. For example, a course that serves as equivalent to an AP score of 4 or 5 can serve as a subsequent course for students earning an AP Exam score of 3. A course that serves as an equivalent to an AP score of 5 can serve as a subsequent course for students earning an AP Exam score of 4.

Identifying the Non-AP Comparison Groups and Subsequent Coursework

Students

To be included in one of the non-AP groups, students must not have taken the AP Exam, attended a postsecondary institution with one or more AP Exam takers, and must have taken the AP equivalent course(s) as well as a subsequent course on campus. For example, if two courses (e.g., Hist 101, Hist 201) are noted as equivalent for an AP Exam (e.g., AP United States History) score (e.g., 3), the student must have taken both courses along with a subsequent history course.

Subsequent Course Identification

The next course is the course(s) taken in the first term following the completion of all equivalent courses. If a student took more than one subsequent course in a term, then a weighted average was calculated and used as the course grade. Any same-subject nonequivalent course can serve as the next course for all students who have completed the equivalent courses. In addition, a more advanced equivalent course can serve as a subsequent course to a less advanced equivalent course. For example, any course equivalent to an AP score of 4 or 5 can serve as a subsequent course for a student who took the course(s) on campus that are equivalent to earning a 3 on the AP Exam. Similarly, any course equivalent to an AP score of 5 can also serve as a subsequent course for a student who took the course(s) on campus that are equivalent to earning a 3 on the AP Exam.

Non-AP Comparison Groups

There are three non-AP comparison groups: those who completed the college course(s) considered equivalent to an AP score of 3 (non-AP 3); those who completed the college course(s) considered equivalent to an AP score of 4 (non-AP 4); and those who completed the college course(s) considered equivalent to an AP score of 5 (non-AP 5). In addition, students must have taken a subsequent course in the same subject. A student could appear in more than one non-AP group and could appear in all 3 non-AP groups. For example, if a school had one policy for AP Statistics and awarded credit in Stat 101 for a score of 3, 4 or 5, then a non-AP examinee who took Stat 101 and another Statistics course in a later term would be in the non-AP 3, non-AP 4, and non-AP 5 groups. A school could also have differential policies by AP score that would allow students to be in all three non-AP groups. If a school awarded Stat 101 for an AP score of 3, and both Stat 101 and Stat 102 for AP scores of 4 or 5, then a student who took Stat 101 in one term, Stat 102 in a subsequent term, and a next course in a subsequent term would be in all three non-AP comparison groups.

Appendix B

Table B - 1: Characteristics of Students in the AP Computer Science A Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------------------|------------------------|--------------------------|-------|-------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 483 | 1,101 | 1,093 | 42 | 207 | 222 |
| Gender | Female | 20.3 | 18.4 | 18.6 | 4.8 | 12.1 | 8.1 |
| | Male | 79.7 | 81.6 | 81.4 | 95.2 | 87.9 | 91.9 |
| Race/ Ethnicity | American Indian | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Asian American | 10.8 | 12.9 | 13.0 | 14.3 | 29.0 | 20.7 |
| | Black/African American | 4.3 | 4.2 | 4.2 | 2.4 | 1.0 | 0.9 |
| | Hispanic | 4.3 | 5.4 | 5.5 | 2.4 | 3.4 | 1.4 |
| | White | 51.3 | 54.3 | 54.5 | 52.4 | 56.5 | 66.2 |
| | Other | 2.3 | 1.7 | 1.6 | 4.8 | 2.4 | 1.8 |
| | No Response/Missing | 26.9 | 21.4 | 21.1 | 23.8 | 7.7 | 9.0 |
| High School GPA | A+ | 6.2 | 10.7 | 10.8 | 9.5 | 8.7 | 18.5 |
| | A | 23.0 | 28.7 | 28.9 | 21.4 | 38.6 | 42.3 |
| | A- | 22.2 | 20.1 | 20.1 | 14.3 | 28.0 | 16.2 |
| | B+ | 11.0 | 9.8 | 9.9 | 9.5 | 10.6 | 9.5 |
| | B | 9.5 | 6.9 | 6.8 | 16.7 | 5.8 | 4.1 |
| | B- | 1.4 | 1.4 | 1.4 | 0.0 | 1.0 | 0.5 |
| | C+ | 0.2 | 0.4 | 0.4 | 2.4 | 0.5 | 0.0 |
| | C | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 26.5 | 22.0 | 21.7 | 26.2 | 6.8 | 9.0 |
| SAT Composite Score Band | 2100–2400 | 5.8 | 10.3 | 10.3 | 4.8 | 19.3 | 41.4 |
| | 1800–2090 | 30.2 | 38.9 | 39.1 | 47.6 | 52.7 | 45.5 |
| | 1500–1790 | 29.4 | 24.6 | 24.6 | 19.0 | 21.3 | 4.5 |
| | 1200–1490 | 8.3 | 5.4 | 5.4 | 4.8 | 0.5 | 0.0 |
| | 900–1190 | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 26.1 | 20.8 | 20.5 | 23.8 | 6.3 | 8.6 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| Highest Parental Education | No High School Diploma | 1.2 | 1.2 | 1.2 | 2.4 | 1.9 | 0.5 |
| | High School Diploma | 13.0 | 12.4 | 12.5 | 11.9 | 8.2 | 5.9 |
| | Associate Degree | 4.6 | 5.1 | 5.0 | 2.4 | 4.3 | 2.3 |
| | Bachelor's Degree | 23.4 | 24.6 | 24.6 | 26.2 | 30.4 | 28.4 |
| | Graduate Degree | 27.7 | 29.9 | 30.1 | 26.2 | 43.0 | 49.1 |
| | Missing | 30.0 | 26.8 | 26.5 | 31.0 | 12.1 | 14.0 |

Table B - 2: Characteristics of Students in the AP Macroeconomics Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|---------------------------|------------------------|--------------------------|-------|-------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 5,027 | 9,996 | 9,996 | 183 | 846 | 521 |
| Gender | Female | 37.3 | 37.5 | 37.5 | 37.7 | 34.9 | 25.9 |
| | Male | 62.7 | 62.5 | 62.5 | 62.3 | 65.1 | 74.1 |
| Race/ Ethnicity | American Indian | 0.2 | 0.2 | 0.2 | 0.0 | 0.5 | 0.0 |
| | Asian American | 5.7 | 9.0 | 9.0 | 9.3 | 14.8 | 16.1 |
| | Black/African American | 4.2 | 3.6 | 3.6 | 2.7 | 3.2 | 1.5 |
| | Hispanic | 5.6 | 4.8 | 4.8 | 5.5 | 5.1 | 4.0 |
| | White | 62.6 | 54.5 | 54.5 | 72.7 | 57.9 | 65.3 |
| | Other | 1.7 | 1.7 | 1.7 | 2.7 | 0.9 | 1.9 |
| | No Response/Missing | 20.0 | 26.2 | 26.2 | 7.1 | 17.6 | 11.1 |
| High School GPA | A+ | 5.3 | 6.8 | 6.8 | 6.0 | 11.1 | 19.0 |
| | A | 21.1 | 21.1 | 21.1 | 29.0 | 30.4 | 39.2 |
| | A- | 22.8 | 20.7 | 20.7 | 30.1 | 25.9 | 22.1 |
| | B+ | 16.6 | 13.5 | 13.5 | 18.6 | 10.3 | 5.0 |
| | B | 10.5 | 8.1 | 8.1 | 8.2 | 3.7 | 2.5 |
| | B- | 2.7 | 2.2 | 2.2 | 2.2 | 0.5 | 0.2 |
| | C+ | 0.9 | 0.8 | 0.8 | 0.5 | 0.0 | 0.0 |
| | C | 0.2 | 0.2 | 0.2 | 0.0 | 0.1 | 0.0 |
| | C- or Lower | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 19.9 | 26.6 | 26.6 | 5.5 | 18.1 | 12.1 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| SAT Composite Score Band | 2100–2400 | 1.3 | 4.0 | 4.0 | 3.3 | 12.1 | 28.6 |
| | 1800–2090 | 21.8 | 24.7 | 24.7 | 42.6 | 49.2 | 52.8 |
| | 1500–1790 | 44.7 | 34.3 | 34.3 | 47.0 | 18.9 | 7.9 |
| | 1200–1490 | 13.3 | 10.8 | 10.8 | 2.2 | 0.7 | 0.0 |
| | 900–1190 | 0.6 | 0.9 | 0.9 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 18.3 | 25.4 | 25.4 | 4.9 | 19.1 | 10.7 |
| Highest Parental Education | No High School Diploma | 0.9 | 1.0 | 1.0 | 0.0 | 0.7 | 0.4 |
| | High School Diploma | 12.4 | 10.8 | 10.8 | 13.7 | 7.4 | 6.1 |
| | Associate Degree | 4.2 | 3.7 | 3.7 | 3.8 | 3.7 | 0.8 |
| | Bachelor’s Degree | 33.5 | 28.4 | 28.4 | 37.7 | 28.5 | 31.5 |
| | Graduate Degree | 26.2 | 26.2 | 26.2 | 35.5 | 37.6 | 42.4 |
| | Missing | 22.8 | 30.0 | 30.0 | 9.3 | 22.1 | 18.8 |

Table B - 3: Characteristics of Students in the AP Microeconomics Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|--------|--------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 8,657 | 18,247 | 18,484 | 198 | 536 | 328 |
| Gender | Female | 38.6 | 39.0 | 38.9 | 33.3 | 30.4 | 21.6 |
| | Male | 61.4 | 61.0 | 61.1 | 66.7 | 69.6 | 78.4 |
| Race/ Ethnicity | American Indian | 0.3 | 0.3 | 0.3 | 0.5 | 0.0 | 0.3 |
| | Asian American | 5.9 | 8.8 | 9.0 | 11.6 | 16.4 | 19.8 |
| | Black/African American | 3.6 | 3.7 | 3.7 | 3.5 | 1.1 | 0.6 |
| | Hispanic | 4.2 | 4.6 | 4.6 | 4.5 | 2.6 | 4.3 |
| | White | 62.7 | 56.7 | 56.6 | 72.2 | 62.5 | 62.2 |
| | Other | 1.6 | 1.6 | 1.7 | 1.5 | 1.1 | 2.4 |
| | No Response/Missing | 21.8 | 24.2 | 24.1 | 6.1 | 16.2 | 10.4 |
| High School GPA | A+ | 4.9 | 7.6 | 7.8 | 8.6 | 13.4 | 21.3 |
| | A | 21.3 | 23.1 | 23.3 | 28.8 | 31.0 | 40.2 |
| | A- | 22.4 | 21.4 | 21.3 | 30.8 | 25.0 | 17.7 |
| | B+ | 16.4 | 13.6 | 13.4 | 17.7 | 11.2 | 5.2 |
| | B | 9.8 | 7.3 | 7.2 | 8.1 | 3.0 | 1.5 |

| | | | | | | | |
|----------------------------------|------------------------|------|------|------|------|------|------|
| | B- | 2.4 | 1.8 | 1.8 | 1.0 | 0.6 | 0.0 |
| | C+ | 0.7 | 0.5 | 0.5 | 0.0 | 0.2 | 0.0 |
| | C | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 21.8 | 24.5 | 24.5 | 5.1 | 15.7 | 14.0 |
| SAT Composite Score Band | 2100–2400 | 1.3 | 3.9 | 4.7 | 2.0 | 12.1 | 45.4 |
| | 1800–2090 | 21.7 | 26.5 | 26.5 | 47.0 | 50.0 | 38.1 |
| | 1500–1790 | 42.6 | 34.8 | 34.4 | 46.0 | 20.5 | 5.2 |
| | 1200–1490 | 13.4 | 10.5 | 10.3 | 3.0 | 0.2 | 0.0 |
| | 900–1190 | 0.6 | 0.7 | 0.7 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 20.3 | 23.5 | 23.3 | 2.0 | 17.2 | 11.3 |
| Highest Parental Education | No High School Diploma | 0.8 | 1.1 | 1.1 | 0.5 | 1.5 | 1.5 |
| | High School Diploma | 11.9 | 11.1 | 11.0 | 11.6 | 7.5 | 4.6 |
| | Associate Degree | 4.4 | 3.8 | 3.7 | 4.5 | 1.7 | 1.8 |
| | Bachelor's Degree | 31.8 | 28.5 | 28.4 | 38.9 | 30.6 | 22.0 |
| | Graduate Degree | 26.4 | 27.7 | 28.0 | 34.8 | 38.6 | 47.6 |
| | Missing | 24.7 | 27.9 | 27.9 | 9.6 | 20.1 | 22.6 |

Table B - 4: Characteristics of Students in the AP English Language and Composition Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|--------|--------|-----------|-------|-------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 19,773 | 21,480 | 16,634 | 3,716 | 2,786 | 1,104 |
| Gender | Female | 52.8 | 51.9 | 51.6 | 67.9 | 62.7 | 60.7 |
| | Male | 47.2 | 48.1 | 48.4 | 32.1 | 37.3 | 39.3 |
| Race/ Ethnicity | American Indian | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.5 |
| | Asian American | 3.7 | 5.1 | 5.3 | 5.8 | 8.9 | 11.1 |
| | Black/African American | 7.6 | 6.3 | 5.4 | 5.4 | 2.8 | 2.2 |
| | Hispanic | 7.0 | 6.1 | 6.7 | 9.8 | 5.6 | 3.7 |
| | White | 50.0 | 48.1 | 50.0 | 67.7 | 69.2 | 71.3 |
| | Other | 1.6 | 1.6 | 1.7 | 2.2 | 1.9 | 2.2 |
| | No Response/Missing | 29.8 | 32.5 | 30.7 | 8.8 | 11.4 | 9.1 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| High School GPA | A+ | 3.2 | 3.5 | 3.4 | 11.4 | 16.9 | 26.7 |
| | A | 15.2 | 15.3 | 14.6 | 32.1 | 37.5 | 39.1 |
| | A- | 18.0 | 17.3 | 17.4 | 25.8 | 22.6 | 16.8 |
| | B+ | 16.1 | 15.0 | 15.9 | 13.9 | 8.1 | 6.4 |
| | B | 11.7 | 11.0 | 12.0 | 6.4 | 3.1 | 1.8 |
| | B- | 3.8 | 3.6 | 4.0 | 1.5 | 0.6 | 0.7 |
| | C+ | 1.5 | 1.2 | 1.4 | 0.2 | 0.2 | 0.0 |
| | C | 0.5 | 0.4 | 0.4 | 0.2 | 0.0 | 0.0 |
| | C- or Lower | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 29.7 | 32.5 | 30.8 | 8.6 | 11.0 | 8.3 |
| SAT Composite Score Band | 2100–2400 | 0.4 | 0.8 | 0.9 | 1.3 | 12.8 | 41.6 |
| | 1800–2090 | 10.0 | 12.9 | 12.3 | 38.4 | 58.6 | 46.6 |
| | 1500–1790 | 35.9 | 35.6 | 34.3 | 50.0 | 17.3 | 3.4 |
| | 1200–1490 | 22.7 | 20.8 | 20.5 | 2.9 | 0.3 | 0.0 |
| | 900–1190 | 2.4 | 2.1 | 2.4 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 28.6 | 27.7 | 29.5 | 7.4 | 11.0 | 8.4 |
| Highest Parental Education | No High School Diploma | 1.4 | 1.4 | 1.5 | 1.0 | 0.5 | 0.3 |
| | High School Diploma | 15.3 | 13.7 | 13.9 | 14.0 | 9.2 | 5.9 |
| | Associate Degree | 5.4 | 4.9 | 5.2 | 5.5 | 3.2 | 2.2 |
| | Bachelor's Degree | 26.0 | 24.8 | 25.1 | 35.6 | 32.3 | 29.4 |
| | Graduate Degree | 19.4 | 19.7 | 20.5 | 31.3 | 39.4 | 49.8 |
| | Missing | 32.6 | 35.5 | 33.8 | 12.6 | 15.4 | 12.4 |

Table B - 5: Characteristics of Students in the AP English Literature and Composition Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|-----------------|--------------------------|--------|-------|-----------|-------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 14,953 | 11,614 | 8,421 | 3,529 | 3,075 | 864 |
| Gender | Female | 53.0 | 50.4 | 51.1 | 66.1 | 64.1 | 59.5 |
| | Male | 47.0 | 49.6 | 48.9 | 33.9 | 35.9 | 40.5 |
| Race/ Ethnicity | American Indian | 0.3 | 0.2 | 0.3 | 0.3 | 0.4 | 0.5 |
| | Asian American | 2.5 | 4.5 | 4.9 | 4.8 | 7.3 | 9.3 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| | Black/African American | 8.4 | 7.3 | 6.8 | 4.7 | 2.6 | 1.2 |
| | Hispanic | 7.9 | 5.1 | 6.8 | 8.0 | 4.4 | 3.6 |
| | White | 47.5 | 48.7 | 50.4 | 66.3 | 75.5 | 76.6 |
| | Other | 1.5 | 1.6 | 1.7 | 1.9 | 2.2 | 2.5 |
| | No Response/Missing | 31.8 | 32.6 | 29.2 | 14.1 | 7.7 | 6.4 |
| High School GPA | A+ | 2.9 | 3.5 | 3.7 | 11.8 | 19.6 | 25.9 |
| | A | 14.3 | 16.0 | 16.1 | 31.9 | 38.1 | 41.3 |
| | A- | 17.3 | 17.2 | 17.6 | 24.2 | 21.7 | 19.2 |
| | B+ | 15.8 | 14.8 | 16.0 | 12.2 | 8.8 | 5.1 |
| | B | 11.6 | 10.5 | 11.5 | 5.1 | 3.7 | 2.2 |
| | B- | 3.8 | 3.5 | 3.9 | 1.3 | 1.1 | 0.5 |
| | C+ | 1.7 | 1.3 | 1.5 | 0.2 | 0.1 | 0.2 |
| | C | 0.6 | 0.4 | 0.4 | 0.1 | 0.0 | 0.0 |
| | C- or Lower | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 31.8 | 32.6 | 29.2 | 13.3 | 6.8 | 5.6 |
| SAT Composite Score Band | 2100–2400 | 0.2 | 0.8 | 1.1 | 1.5 | 13.9 | 38.5 |
| | 1800–2090 | 7.8 | 12.1 | 12.4 | 38.1 | 63.2 | 53.8 |
| | 1500–1790 | 34.8 | 34.6 | 35.6 | 46.3 | 16.9 | 4.4 |
| | 1200–1490 | 24.0 | 19.6 | 21.0 | 1.8 | 0.2 | 0.1 |
| | 900–1190 | 2.5 | 1.5 | 1.9 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 30.7 | 31.4 | 27.8 | 12.3 | 5.8 | 3.1 |
| Highest Parental Education | No High School Diploma | 1.3 | 0.8 | 1.0 | 0.8 | 0.5 | 0.2 |
| | High School Diploma | 16.0 | 13.6 | 14.6 | 12.7 | 10.2 | 5.7 |
| | Associate Degree | 5.6 | 4.8 | 5.2 | 4.9 | 3.7 | 3.2 |
| | Bachelor's Degree | 25.4 | 26.5 | 27.2 | 33.7 | 33.9 | 31.8 |
| | Graduate Degree | 17.3 | 19.0 | 20.1 | 30.7 | 41.2 | 48.8 |
| | Missing | 34.4 | 35.2 | 31.9 | 17.2 | 10.4 | 10.2 |

Table B - 6: Characteristics of Students in the AP Environmental Science Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------------------|------------------------|--------------------------|-------|-------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 1,489 | 1,853 | 2,006 | 220 | 404 | 190 |
| Gender | Female | 57.0 | 55.8 | 55.6 | 54.1 | 51.7 | 36.3 |
| | Male | 43.0 | 44.2 | 44.4 | 45.9 | 48.3 | 63.7 |
| Race/ Ethnicity | American Indian | 0.2 | 0.4 | 0.4 | 0.5 | 0.0 | 0.5 |
| | Asian American | 6.6 | 7.0 | 7.5 | 9.5 | 11.1 | 8.4 |
| | Black/African American | 3.0 | 3.1 | 2.9 | 1.4 | 1.0 | 0.5 |
| | Hispanic | 6.4 | 6.3 | 6.0 | 4.5 | 5.7 | 2.6 |
| | White | 65.5 | 62.4 | 62.6 | 76.8 | 71.5 | 77.4 |
| | Other | 1.9 | 1.7 | 1.7 | 2.3 | 2.5 | 2.1 |
| | No Response/Missing | 16.3 | 19.1 | 18.7 | 5.0 | 8.2 | 8.4 |
| High School GPA | A+ | 5.4 | 6.7 | 7.2 | 10.5 | 10.4 | 17.4 |
| | A | 19.9 | 20.7 | 22.5 | 25.9 | 31.9 | 32.6 |
| | A- | 26.1 | 24.3 | 24.1 | 26.8 | 30.0 | 27.4 |
| | B+ | 17.5 | 16.0 | 15.2 | 18.6 | 13.1 | 9.5 |
| | B | 11.9 | 10.3 | 9.6 | 11.8 | 5.9 | 3.7 |
| | B- | 2.6 | 2.3 | 2.1 | 2.7 | 0.5 | 1.1 |
| | C+ | 0.9 | 0.6 | 0.6 | 0.0 | 0.2 | 0.0 |
| | C | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 15.5 | 18.9 | 18.4 | 3.6 | 7.9 | 8.4 |
| SAT Composite Score Band | 2100–2400 | 1.9 | 3.4 | 3.5 | 1.4 | 5.7 | 20.5 |
| | 1800–2090 | 19.2 | 22.0 | 24.8 | 40.9 | 59.4 | 62.1 |
| | 1500–1790 | 44.2 | 39.8 | 38.4 | 49.1 | 27.7 | 8.9 |
| | 1200–1490 | 18.8 | 16.1 | 15.0 | 5.5 | 0.7 | 0.0 |
| | 900–1190 | 1.3 | 1.1 | 1.0 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 14.5 | 17.6 | 17.2 | 3.2 | 6.4 | 8.4 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| Highest Parental Education | No High School Diploma | 2.4 | 2.0 | 1.8 | 3.2 | 1.7 | 0.5 |
| | High School Diploma | 15.2 | 13.9 | 13.4 | 6.8 | 11.4 | 6.3 |
| | Associate Degree | 5.6 | 4.9 | 4.9 | 3.6 | 1.2 | 1.1 |
| | Bachelor's Degree | 30.6 | 28.7 | 29.1 | 34.1 | 33.4 | 29.5 |
| | Graduate Degree | 27.5 | 28.7 | 29.3 | 42.3 | 40.6 | 50.0 |
| | Missing | 18.7 | 21.8 | 21.5 | 10.0 | 11.6 | 12.6 |

Table B - 7: Characteristics of Students in the AP Comparative Government and Politics Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|-------|-------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 961 | 1,614 | 1,821 | 45 | 63 | 78 |
| Gender | Female | 51.1 | 46.6 | 45.7 | 55.6 | 39.7 | 35.9 |
| | Male | 48.9 | 53.4 | 54.3 | 44.4 | 60.3 | 64.1 |
| Race/ Ethnicity | American Indian | 0.6 | 0.8 | 0.7 | 2.2 | 0.0 | 0.0 |
| | Asian American | 5.5 | 5.1 | 5.3 | 6.7 | 3.2 | 12.8 |
| | Black/African American | 9.7 | 7.5 | 6.7 | 2.2 | 0.0 | 0.0 |
| | Hispanic | 6.9 | 5.6 | 5.0 | 2.2 | 0.0 | 3.8 |
| | White | 56.0 | 61.0 | 57.3 | 77.8 | 82.5 | 69.2 |
| | Other | 2.1 | 2.1 | 2.0 | 0.0 | 4.8 | 2.6 |
| | No Response/Missing | 19.3 | 17.8 | 23.0 | 8.9 | 9.5 | 11.5 |
| High School GPA | A+ | 5.4 | 7.8 | 7.4 | 2.2 | 9.5 | 10.3 |
| | A | 20.9 | 21.9 | 20.8 | 24.4 | 38.1 | 37.2 |
| | A- | 19.1 | 20.9 | 19.8 | 33.3 | 25.4 | 25.6 |
| | B+ | 18.7 | 15.9 | 14.6 | 26.7 | 14.3 | 15.4 |
| | B | 11.1 | 10.2 | 9.5 | 4.4 | 3.2 | 0.0 |
| | B- | 3.5 | 3.4 | 3.2 | 0.0 | 0.0 | 0.0 |
| | C+ | 1.1 | 0.9 | 0.8 | 0.0 | 0.0 | 0.0 |
| | C | 0.5 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 19.4 | 18.6 | 23.7 | 8.9 | 9.5 | 11.5 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| SAT Composite Score Band | 2100–2400 | 3.5 | 3.9 | 3.7 | 4.4 | 9.5 | 30.8 |
| | 1800–2090 | 24.7 | 29.1 | 27.7 | 44.4 | 63.5 | 44.9 |
| | 1500–1790 | 38.5 | 36.3 | 33.5 | 35.6 | 17.5 | 11.5 |
| | 1200–1490 | 13.4 | 12.0 | 10.8 | 4.4 | 0.0 | 0.0 |
| | 900–1190 | 0.7 | 0.9 | 0.8 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 19.0 | 17.7 | 23.4 | 11.1 | 9.5 | 12.8 |
| Highest Parental Education | No High School Diploma | 0.8 | 0.9 | 0.8 | 0.0 | 0.0 | 0.0 |
| | High School Diploma | 14.0 | 13.2 | 12.0 | 11.1 | 4.8 | 6.4 |
| | Associate Degree | 5.0 | 4.5 | 4.1 | 0.0 | 1.6 | 0.0 |
| | Bachelor’s Degree | 26.3 | 27.1 | 25.9 | 28.9 | 38.1 | 21.8 |
| | Graduate Degree | 30.8 | 32.5 | 30.6 | 46.7 | 44.4 | 55.1 |
| | Missing | 23.0 | 21.9 | 26.6 | 13.3 | 11.1 | 16.7 |

Table B - 8: Characteristics of Students in the AP United States Government and Politics Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|-------|-------|-----------|-------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 5,796 | 7,159 | 6,991 | 1,132 | 1,114 | 909 |
| Gender | Female | 50.6 | 49.1 | 49.2 | 52.4 | 47.4 | 44.2 |
| | Male | 49.4 | 50.9 | 50.8 | 47.6 | 52.6 | 55.8 |
| Race/ Ethnicity | American Indian | 0.5 | 0.5 | 0.5 | 0.4 | 0.6 | 0.3 |
| | Asian American | 5.6 | 5.4 | 5.5 | 8.3 | 9.4 | 9.0 |
| | Black/African American | 6.9 | 6.3 | 6.4 | 4.1 | 2.5 | 2.4 |
| | Hispanic | 12.5 | 10.9 | 11.1 | 8.7 | 5.9 | 4.1 |
| | White | 54.0 | 54.4 | 53.8 | 64.8 | 67.6 | 71.4 |
| | Other | 1.8 | 1.9 | 1.9 | 3.2 | 2.2 | 2.4 |
| | No Response/Missing | 18.7 | 20.6 | 20.9 | 10.5 | 11.7 | 10.3 |
| High School GPA | A+ | 9.7 | 9.2 | 9.3 | 15.7 | 15.0 | 21.0 |
| | A | 25.3 | 24.1 | 24.2 | 30.0 | 34.8 | 38.0 |
| | A- | 21.5 | 21.1 | 21.1 | 23.3 | 26.4 | 21.7 |
| | B+ | 13.4 | 13.2 | 13.0 | 14.3 | 9.7 | 6.3 |
| | B | 7.7 | 8.2 | 7.9 | 5.6 | 2.5 | 1.8 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| | B- | 2.2 | 2.2 | 2.2 | 0.5 | 0.5 | 0.8 |
| | C+ | 0.8 | 0.9 | 0.9 | 0.2 | 0.3 | 0.0 |
| | C | 0.3 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 19.0 | 20.8 | 21.2 | 10.3 | 10.8 | 10.6 |
| SAT Composite Score Band | 2100–2400 | 3.1 | 3.5 | 3.6 | 3.4 | 11.7 | 26.5 |
| | 1800–2090 | 25.8 | 25.8 | 25.9 | 50.5 | 56.0 | 52.0 |
| | 1500–1790 | 37.5 | 35.7 | 35.1 | 34.4 | 21.5 | 10.3 |
| | 1200–1490 | 14.5 | 14.1 | 14.1 | 2.5 | 0.7 | 0.0 |
| | 900–1190 | 1.3 | 1.3 | 1.3 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 17.7 | 19.5 | 19.9 | 9.2 | 10.1 | 11.1 |
| Highest Parental Education | No High School Diploma | 2.6 | 2.2 | 2.2 | 3.0 | 1.3 | 0.3 |
| | High School Diploma | 16.2 | 15.4 | 15.2 | 10.0 | 9.2 | 5.6 |
| | Associate Degree | 4.5 | 4.4 | 4.4 | 3.4 | 2.6 | 2.0 |
| | Bachelor's Degree | 28.5 | 27.6 | 27.5 | 32.1 | 32.7 | 31.6 |
| | Graduate Degree | 25.5 | 26.0 | 25.8 | 37.2 | 38.9 | 45.7 |
| | Missing | 22.8 | 24.5 | 24.8 | 14.3 | 15.3 | 14.9 |

Table B - 9: Characteristics of Students in the AP Human Geography Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|------|------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 508 | 637 | 525 | 66 | 77 | 58 |
| Gender | Female | 48.6 | 48.8 | 49.1 | 62.1 | 41.6 | 44.8 |
| | Male | 51.4 | 51.2 | 50.9 | 37.9 | 58.4 | 55.2 |
| Race/ Ethnicity | American Indian | 0.6 | 0.5 | 0.6 | 0.0 | 0.0 | 0.0 |
| | Asian American | 2.8 | 3.0 | 3.2 | 4.5 | 6.5 | 3.4 |
| | Black/African American | 3.3 | 3.6 | 2.9 | 6.1 | 1.3 | 0.0 |
| | Hispanic | 5.9 | 7.7 | 9.0 | 9.1 | 9.1 | 3.4 |
| | White | 72.2 | 67.8 | 65.7 | 71.2 | 61.0 | 82.8 |
| | Other | 1.4 | 1.3 | 1.3 | 4.5 | 2.6 | 3.4 |
| | No Response/Missing | 13.8 | 16.2 | 17.3 | 4.5 | 19.5 | 6.9 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| High School GPA | A+ | 7.5 | 6.4 | 5.9 | 12.1 | 10.4 | 17.2 |
| | A | 29.1 | 26.8 | 23.4 | 24.2 | 28.6 | 31.0 |
| | A- | 24.0 | 23.9 | 24.0 | 22.7 | 24.7 | 31.0 |
| | B+ | 13.4 | 14.3 | 14.7 | 22.7 | 14.3 | 6.9 |
| | B | 10.2 | 10.8 | 12.6 | 10.6 | 6.5 | 5.2 |
| | B- | 2.0 | 1.9 | 2.1 | 3.0 | 0.0 | 0.0 |
| | C+ | 0.4 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 |
| | C | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 13.4 | 15.5 | 17.1 | 4.5 | 15.6 | 8.6 |
| SAT Composite Score Band | 2100–2400 | 2.6 | 2.4 | 1.9 | 3.0 | 3.9 | 20.7 |
| | 1800–2090 | 24.6 | 22.6 | 19.2 | 33.3 | 48.1 | 60.3 |
| | 1500–1790 | 44.3 | 44.6 | 44.2 | 56.1 | 32.5 | 8.6 |
| | 1200–1490 | 15.4 | 15.4 | 18.1 | 6.1 | 0.0 | 1.7 |
| | 900–1190 | 0.8 | 0.6 | 0.8 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 12.4 | 14.4 | 15.8 | 1.5 | 15.6 | 8.6 |
| Highest Parental Education | No High School Diploma | 1.2 | 1.3 | 1.3 | 3.0 | 0.0 | 0.0 |
| | High School Diploma | 16.3 | 16.3 | 17.9 | 12.1 | 7.8 | 5.2 |
| | Associate Degree | 4.1 | 4.4 | 4.4 | 1.5 | 3.9 | 1.7 |
| | Bachelor's Degree | 31.3 | 30.8 | 29.5 | 31.8 | 28.6 | 43.1 |
| | Graduate Degree | 29.3 | 26.7 | 25.1 | 42.4 | 41.6 | 36.2 |
| | Missing | 17.7 | 20.6 | 21.7 | 9.1 | 18.2 | 13.8 |

Table B - 10: Characteristics of Students in the AP Music Theory Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|------|------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 118 | 223 | 227 | 34 | 30 | 53 |
| Gender | Female | 52.5 | 52.0 | 50.7 | 35.3 | 50.0 | 41.5 |
| | Male | 47.5 | 48.0 | 49.3 | 64.7 | 50.0 | 58.5 |
| Race/ Ethnicity | American Indian | 0.8 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Asian American | 5.9 | 4.0 | 3.5 | 5.9 | 10.0 | 9.4 |
| | Black/African American | 7.6 | 5.4 | 3.1 | 11.8 | 3.3 | 1.9 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| | Hispanic | 11.9 | 7.6 | 1.8 | 5.9 | 6.7 | 1.9 |
| | White | 55.1 | 58.7 | 55.9 | 73.5 | 73.3 | 69.8 |
| | Other | 1.7 | 1.8 | 1.3 | 0.0 | 0.0 | 0.0 |
| | No Response/Missing | 16.9 | 22.0 | 34.4 | 2.9 | 6.7 | 17.0 |
| High School GPA | A+ | 5.9 | 9.0 | 10.6 | 8.8 | 10.0 | 7.5 |
| | A | 23.7 | 27.4 | 26.0 | 35.3 | 26.7 | 43.4 |
| | A- | 23.7 | 21.1 | 15.0 | 32.4 | 40.0 | 13.2 |
| | B+ | 16.9 | 13.0 | 9.3 | 8.8 | 6.7 | 7.5 |
| | B | 10.2 | 6.7 | 4.0 | 8.8 | 6.7 | 5.7 |
| | B- | 1.7 | 1.3 | 0.4 | 0.0 | 10.0 | 1.9 |
| | C+ | 0.8 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 |
| | C | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | C- or Lower | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 16.9 | 21.1 | 34.4 | 5.9 | 0.0 | 20.8 |
| SAT Composite Score Band | 2100–2400 | 1.7 | 3.6 | 6.2 | 2.9 | 6.7 | 24.5 |
| | 1800–2090 | 22.9 | 28.3 | 29.5 | 58.8 | 56.7 | 43.4 |
| | 1500–1790 | 37.3 | 33.6 | 24.7 | 26.5 | 33.3 | 17.0 |
| | 1200–1490 | 19.5 | 13.0 | 7.0 | 5.9 | 3.3 | 1.9 |
| | 900–1190 | 1.7 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 16.9 | 20.6 | 32.6 | 5.9 | 0.0 | 13.2 |
| Highest Parental Education | No High School Diploma | 0.8 | 0.4 | 0.4 | 0.0 | 0.0 | 3.8 |
| | High School Diploma | 14.4 | 8.5 | 4.8 | 20.6 | 26.7 | 7.5 |
| | Associate Degree | 10.2 | 7.6 | 4.8 | 5.9 | 3.3 | 0.0 |
| | Bachelor's Degree | 32.2 | 28.7 | 22.0 | 23.5 | 30.0 | 20.8 |
| | Graduate Degree | 22.0 | 29.1 | 31.3 | 41.2 | 40.0 | 39.6 |
| | Missing | 20.3 | 25.6 | 36.6 | 8.8 | 0.0 | 28.3 |

Table B - 11: Characteristics of Students in the AP Psychology Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|----------------------------------|------------------------|--------------------------|--------|--------|-----------|------|-------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 7,000 | 12,572 | 14,408 | 287 | 901 | 1,456 |
| Gender | Female | 73.5 | 71.4 | 71.1 | 80.8 | 73.1 | 73.5 |
| | Male | 26.5 | 28.6 | 28.9 | 19.2 | 26.9 | 26.5 |
| Race/ Ethnicity | American Indian | 0.4 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 |
| | Asian American | 5.2 | 8.0 | 7.9 | 9.8 | 11.1 | 13.5 |
| | Black/African American | 5.9 | 5.5 | 5.7 | 4.5 | 4.2 | 2.3 |
| | Hispanic | 6.8 | 7.2 | 7.0 | 9.8 | 4.6 | 3.1 |
| | White | 60.6 | 55.7 | 53.8 | 66.6 | 63.7 | 56.6 |
| | Other | 1.9 | 2.1 | 2.0 | 1.0 | 3.9 | 2.5 |
| | No Response/Missing | 19.2 | 21.1 | 23.3 | 8.0 | 12.3 | 21.7 |
| High School GPA | A+ | 7.3 | 7.9 | 7.9 | 5.6 | 6.4 | 13.5 |
| | A | 23.0 | 24.1 | 23.5 | 27.2 | 29.0 | 33.4 |
| | A- | 22.5 | 21.0 | 20.3 | 29.6 | 26.9 | 21.0 |
| | B+ | 15.5 | 13.9 | 13.3 | 18.1 | 17.1 | 8.0 |
| | B | 9.0 | 8.1 | 7.8 | 10.1 | 7.4 | 2.5 |
| | B- | 2.5 | 2.3 | 2.2 | 1.7 | 0.7 | 0.2 |
| | C+ | 0.9 | 0.9 | 0.8 | 0.7 | 0.3 | 0.1 |
| | C | 0.2 | 0.3 | 0.3 | 0.0 | 0.1 | 0.0 |
| | C- or Lower | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 19.1 | 21.5 | 23.7 | 7.0 | 12.1 | 21.3 |
| SAT Composite Score Band | 2100–2400 | 1.1 | 2.9 | 3.3 | 0.3 | 3.4 | 16.1 |
| | 1800–2090 | 18.3 | 23.2 | 22.4 | 23.3 | 44.5 | 45.4 |
| | 1500–1790 | 41.6 | 36.5 | 34.8 | 60.6 | 37.6 | 15.4 |
| | 1200–1490 | 19.6 | 15.7 | 15.4 | 10.5 | 3.1 | 0.7 |
| | 900–1190 | 1.5 | 1.4 | 1.5 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| | Missing | 17.9 | 20.2 | 22.5 | 5.2 | 11.3 | 22.5 |
| Highest Parental Education | No High School Diploma | 1.8 | 1.9 | 1.8 | 3.8 | 0.9 | 0.7 |
| | High School Diploma | 16.8 | 15.3 | 15.2 | 15.0 | 12.9 | 8.2 |
| | Associate Degree | 6.2 | 5.4 | 5.1 | 7.3 | 4.2 | 2.2 |

| | | | | | | |
|-------------------|------|------|------|------|------|------|
| Bachelor's Degree | 29.2 | 26.7 | 25.5 | 34.8 | 30.6 | 24.4 |
| Graduate Degree | 23.2 | 25.3 | 24.8 | 27.5 | 35.0 | 39.4 |
| Missing | 22.8 | 25.4 | 27.6 | 11.5 | 16.4 | 25.1 |

Table B - 12: Characteristics of Students in the AP Physics C: Mechanics Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------------------|------------------------|--------------------------|-------|-------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 3,805 | 6,393 | 7,762 | 62 | 282 | 500 |
| Gender | Female | 39.3 | 35.6 | 32.8 | 24.2 | 17.0 | 12.6 |
| | Male | 60.7 | 64.4 | 67.2 | 75.8 | 83.0 | 87.4 |
| Race/ Ethnicity | American Indian | 0.5 | 0.4 | 0.3 | 0.0 | 0.7 | 0.2 |
| | Asian American | 10.5 | 15.1 | 14.3 | 12.9 | 22.7 | 22.8 |
| | Black/African American | 5.1 | 4.3 | 3.8 | 0.0 | 0.7 | 0.4 |
| | Hispanic | 10.8 | 7.7 | 6.8 | 9.7 | 3.5 | 2.4 |
| | White | 61.4 | 56.8 | 51.7 | 74.2 | 66.0 | 58.8 |
| | Other | 2.6 | 2.7 | 2.5 | 1.6 | 2.5 | 3.4 |
| | No Response/Missing | 9.0 | 12.8 | 20.6 | 1.6 | 3.9 | 12.0 |
| High School GPA | A+ | 16.0 | 16.9 | 15.8 | 16.1 | 19.9 | 25.6 |
| | A | 34.5 | 34.9 | 32.1 | 41.9 | 41.5 | 37.4 |
| | A- | 23.3 | 21.3 | 19.2 | 24.2 | 22.7 | 15.4 |
| | B+ | 10.9 | 9.2 | 7.9 | 12.9 | 8.2 | 5.2 |
| | B | 5.2 | 3.8 | 3.2 | 3.2 | 3.2 | 1.6 |
| | B- | 0.9 | 0.6 | 0.5 | 0.0 | 0.0 | 0.0 |
| | C+ | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | C | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| | C- or Lower | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| | Missing | 9.0 | 13.2 | 21.0 | 1.6 | 4.6 | 14.4 |
| SAT Composite Score Band | 2100–2400 | 5.8 | 9.2 | 10.2 | 6.5 | 26.6 | 46.8 |
| | 1800–2090 | 40.3 | 44.3 | 40.8 | 75.8 | 58.9 | 36.8 |
| | 1500–1790 | 38.7 | 29.6 | 24.8 | 16.1 | 13.1 | 2.8 |
| | 1200–1490 | 7.4 | 5.1 | 3.8 | 1.6 | 0.4 | 0.0 |
| | 900–1190 | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 7.6 | 11.7 | 20.3 | 0.0 | 1.1 | 13.6 |
| Highest Parental Education | No High School Diploma | 2.5 | 2.0 | 1.6 | 0.0 | 1.8 | 0.4 |
| | High School Diploma | 13.9 | 12.0 | 10.1 | 9.7 | 5.7 | 4.6 |
| | Associate Degree | 5.0 | 4.4 | 3.8 | 3.2 | 2.5 | 0.6 |
| | Bachelor’s Degree | 31.1 | 28.5 | 25.6 | 33.9 | 29.1 | 23.0 |
| | Graduate Degree | 33.6 | 34.9 | 33.2 | 43.5 | 50.7 | 49.0 |
| | Missing | 13.9 | 18.2 | 25.6 | 9.7 | 10.3 | 22.4 |

Table B - 13: Characteristics of Students in the AP Physics C: Electricity and Magnetism Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|-------|-------|-----------|------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 1,633 | 3,264 | 4,443 | 10 | 128 | 268 |
| Gender | Female | 33.5 | 30.8 | 27.8 | 20.0 | 16.4 | 14.9 |
| | Male | 66.5 | 69.2 | 72.2 | 80.0 | 83.6 | 85.1 |
| Race/ Ethnicity | American Indian | 0.3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.4 |
| | Asian American | 15.7 | 17.3 | 16.2 | 30.0 | 24.2 | 22.0 |
| | Black/African American | 3.3 | 3.6 | 2.9 | 0.0 | 0.8 | 0.4 |
| | Hispanic | 8.9 | 6.2 | 5.1 | 0.0 | 1.6 | 3.4 |
| | White | 56.3 | 56.3 | 48.9 | 70.0 | 65.6 | 53.4 |
| | Other | 3.6 | 2.9 | 2.7 | 0.0 | 3.9 | 4.1 |
| | No Response/Missing | 11.8 | 13.5 | 23.9 | 0.0 | 3.9 | 16.4 |
| High School GPA | A+ | 13.1 | 15.3 | 13.9 | 20.0 | 16.4 | 19.8 |
| | A | 33.1 | 35.8 | 31.8 | 70.0 | 39.8 | 37.7 |
| | A- | 25.7 | 22.2 | 19.2 | 0.0 | 26.6 | 15.7 |
| | B+ | 10.1 | 8.9 | 7.4 | 0.0 | 10.9 | 5.2 |
| | B | 4.6 | 3.3 | 2.7 | 10.0 | 0.8 | 1.5 |
| | B- | 0.9 | 0.6 | 0.5 | 0.0 | 0.0 | 0.4 |
| | C+ | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| | C | 0.1 | 0.1 | 0.0 | 0.0 | 0.8 | 0.4 |
| | C- or Lower | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 12.2 | 13.7 | 24.3 | 0.0 | 4.7 | 19.4 |

| | | | | | | | |
|----------------------------|------------------------|------|------|------|------|------|------|
| SAT Composite Score Band | 2100–2400 | 8.2 | 10.8 | 11.3 | 50.0 | 25.0 | 46.3 |
| | 1800–2090 | 43.7 | 47.5 | 41.8 | 50.0 | 60.2 | 32.8 |
| | 1500–1790 | 31.5 | 25.6 | 20.1 | 0.0 | 11.7 | 3.4 |
| | 1200–1490 | 5.4 | 3.5 | 2.5 | 0.0 | 0.0 | 0.0 |
| | 900–1190 | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 11.0 | 12.5 | 24.3 | 0.0 | 3.1 | 17.5 |
| Highest Parental Education | No High School Diploma | 2.4 | 1.9 | 1.6 | 0.0 | 3.1 | 0.0 |
| | High School Diploma | 13.3 | 11.7 | 9.6 | 0.0 | 6.3 | 3.0 |
| | Associate Degree | 4.5 | 4.1 | 3.4 | 0.0 | 4.7 | 0.4 |
| | Bachelor’s Degree | 28.1 | 27.4 | 23.7 | 20.0 | 29.7 | 22.8 |
| | Graduate Degree | 33.9 | 35.6 | 32.4 | 80.0 | 47.7 | 50.4 |
| | Missing | 17.8 | 19.3 | 29.3 | 0.0 | 8.6 | 23.5 |

Table B - 14: Characteristics of Students in the AP Statistics Validity Analyses

| | | Non-AP Comparison Groups | | | AP Groups | | |
|--------------------|------------------------|--------------------------|-------|-------|-----------|-------|------|
| | | 3 | 4 | 5 | 3 | 4 | 5 |
| Number of Students | | 1,859 | 3,255 | 3,204 | 698 | 1,146 | 686 |
| Gender | Female | 61.1 | 54.4 | 53.9 | 43.8 | 42.2 | 32.2 |
| | Male | 38.9 | 45.6 | 46.1 | 56.2 | 57.8 | 67.8 |
| Race/ Ethnicity | American Indian | 0.4 | 0.3 | 0.3 | 0.4 | 0.3 | 0.1 |
| | Asian American | 13.4 | 10.6 | 10.7 | 11.9 | 16.5 | 19.4 |
| | Black/African American | 6.8 | 5.5 | 5.1 | 3.2 | 1.7 | 0.6 |
| | Hispanic | 10.5 | 7.7 | 7.7 | 6.0 | 3.2 | 2.8 |
| | White | 53.5 | 53.6 | 53.9 | 71.9 | 64.8 | 67.9 |
| | Other | 1.4 | 1.5 | 1.5 | 2.0 | 1.7 | 1.9 |
| | No Response/Missing | 14.0 | 20.8 | 20.9 | 4.6 | 11.8 | 7.3 |
| High School GPA | A+ | 13.4 | 9.9 | 9.9 | 10.5 | 14.7 | 25.7 |
| | A | 28.5 | 25.1 | 25.0 | 30.9 | 34.0 | 40.8 |
| | A- | 20.5 | 20.7 | 20.8 | 28.2 | 24.8 | 17.8 |
| | B+ | 13.2 | 13.5 | 13.5 | 17.6 | 9.2 | 3.8 |
| | B | 7.1 | 7.3 | 7.1 | 6.3 | 3.1 | 1.0 |
| | B- | 2.2 | 2.1 | 2.0 | 1.6 | 0.4 | 0.0 |

| | | | | | | | |
|--------------------------------|----------------------------------|------------------------|------|------|------|------|------|
| | C+ | 0.6 | 0.5 | 0.5 | 0.1 | 0.2 | 0.0 |
| | C | 0.4 | 0.3 | 0.3 | 0.0 | 0.1 | 0.0 |
| | C- or Lower | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 13.9 | 20.6 | 20.8 | 4.7 | 13.4 | 10.9 |
| SAT Composite Score Band | 2100–2400 | 4.0 | 3.3 | 3.3 | 4.7 | 12.1 | 40.4 |
| | 1800–2090 | 31.3 | 27.6 | 28.0 | 44.6 | 56.8 | 45.3 |
| | 1500–1790 | 35.4 | 35.3 | 35.2 | 43.7 | 18.4 | 4.2 |
| | 1200–1490 | 15.1 | 12.7 | 12.2 | 2.7 | 0.4 | 0.0 |
| | 900–1190 | 1.3 | 1.3 | 1.2 | 0.0 | 0.0 | 0.0 |
| | 600–890 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Missing | 12.8 | 19.9 | 20.1 | 4.3 | 12.2 | 10.1 |
| | Highest Parental Education | No High School Diploma | 2.7 | 1.8 | 1.8 | 1.0 | 1.3 |
| High School Diploma | | 16.4 | 13.4 | 13.0 | 11.2 | 9.0 | 4.8 |
| Associate Degree | | 4.7 | 4.2 | 4.2 | 4.6 | 2.4 | 1.5 |
| Bachelor's Degree | | 28.1 | 28.3 | 28.4 | 36.4 | 32.8 | 27.0 |
| Graduate Degree | | 28.7 | 26.6 | 26.8 | 37.2 | 37.3 | 51.6 |
| Missing | | 19.4 | 25.7 | 25.8 | 9.6 | 17.3 | 14.9 |

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