
Postsecondary Course Performance of AP Exam Takers in Subsequent Coursework

AP Calculus AB, AP Calculus BC, AP Computer Science Principles, AP European History, AP German Language and Culture, AP Physics 1, AP Physics 2, AP Physics C: Mechanics, AP Physics C: Electricity & Magnetism, AP Psychology, AP Art History

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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 Calculus AB

AP Calculus BC

AP Computer Science Principles

AP European History

AP German Language and Culture

AP Physics 1

AP Physics 2

AP Physics C: Mechanics

AP Physics C: Electricity & Magnetism

AP Psychology

AP Art History

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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

In a prior AP Validity report (Wyatt, Jagesic, Godfrey, 2018)³ we relied on one student cohort to examine the grade differences in students earning college credit via an AP Exam and students taking the equivalent course on the college campus. In this study, we had to combine multiple cohorts in order to yield sample sizes that are large enough for analysis. The number of cohorts combined for each analysis was determined by the number of students taking the AP Exam and scoring a 3 or higher and timing around significant redesign changes to AP Exam titles. The cohorts used for each exam are outlined in Table

¹ Criterion referenced tests measure student performance against a predetermined criterion.

² Because the primary purpose of this research is to understand the utility of AP Exam scores for 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 Jeff Wyatt, Sanja Jagesic, and Kelly Godfrey, *Postsecondary Course Performance of AP Exam Takers in Subsequent Coursework*, (New York, College Board Statistical Report, 2018).

1. For the majority of AP Exams in this validity report we used two years of coursework data from Cohort 2017 and one year of coursework data from Cohort 2018 . Because AP Calculus AB and AP Calculus BC were both redesigned in 2017, we used Cohort 2018 and one year of college coursework data only⁴.

Student transcript data for all included cohorts was collected as part of the National SAT Validity study⁵. The sample for all AP Exams was restricted to institutions providing written guidelines on AP credit and placement policies for each cohort year. The number of institutions included in the analysis by AP subject is presented in Table 2.

Table 1: Summary of Cohorts Used in Analysis

	Cohorts
AP Calculus AB	2018 (1 cohort)
AP Calculus BC	2018 (1 cohort)
AP Computer Science Principles	2017-2018 (2 cohorts)
AP European History	2017-2018 (2 cohorts)
AP German Language and Culture	2017-2018 (2 cohorts)
AP Physics 1	2017-2018 (2 cohorts)
AP Physics 2	2017-2018 (2 cohorts)
AP Physics C: Electricity	2017-2018 (2 cohorts)
AP Physics C: Electricity & Magnetism	2017-2018 (2 cohorts)
AP Psychology	2017-2018 (2 cohorts)
AP Art History	2017-2018 (2 cohorts)

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., German Language). 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.

⁴ More than 90 percent of Cohort 2018 AP Calculus AB and BC students completed the redesigned AP Exams.

⁵ For more information see: <http://files.eric.ed.gov/fulltext/ED563103.pdf>

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 equivalent⁶ 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 institution⁷ 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 German 100 as the AP equivalent course for AP German Language and Culture scores of 3, 4, or 5. Students who did not take the AP German Language and Culture Exam but did take German 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 were conducted to compare the AP and non-AP groups: the AP 3 group was compared to the non-AP 3 group, 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).

⁶ An equivalent course is one for which an AP student receives credit and/or placement per institutional policy at her or his institution.

⁷ While decisions on group membership were made based on the policies at the attending institution, results were calculated using all of the participating institutions.

Results

Table 2 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 AP Physics 2 to 119 in AP Psychology. An AP score of 3 was most frequently the minimum score needed to receive credit or placement.

Table 2: Summary of Institutional AP Credit- and Placement-Granting Policies

	Number of Institutions Granting Credit/ Placement for an AP Exam Score of:			Total Institutions
	3	4	5	
AP Calculus AB	29	32	2	63
AP Calculus BC	19	9	1	29
AP Computer Science Principles	21	6	2	29
AP European History	23	19	1	43
AP German Language and Culture	33	9	2	44
AP Physics 1	29	12	4	45
AP Physics 2	10	4	1	15
AP Physics C: Electricity	30	29	13	72
AP Physics C: Electricity & Magnetism	29	33	16	78
AP Psychology	62	51	6	119
AP Art History	18	10	3	31

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 3 displays the characteristics of the post-secondary 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: Summary of Institutional Characteristics

Number of Institutions		Calculus AB (63)	Calculus BC (29)	Computer Science Principles (29)	Euro History (43)	German (44)	Physics 1 (45)	Physics 2 (15)	Physics C: M (72)	Physics C: E&M (78)	Psychology (119)	Art History (31)
Control	Public	55.6	58.6	65.5	65.1	61.4	73.3	86.7	63.9	60.3	56.3	74.2
	Private	44.4	41.4	34.5	34.9	38.6	26.7	13.3	36.1	39.7	43.7	25.8
U.S. Region	Midwest	34.9	27.6	17.2	18.6	29.6	22.2	20.0	19.4	19.2	21.0	16.1
	Mid-Atlantic	15.9	13.8	20.7	23.3	13.6	11.1	13.3	13.9	19.2	15.1	16.1
	New England	4.8	3.5	3.5	9.3	4.6	11.1	0.0	9.7	7.7	10.9	6.5
	South	12.7	13.8	20.7	25.6	22.7	22.2	20.0	19.4	15.4	18.5	25.8
	Southwest	14.3	13.8	17.2	14.0	6.8	15.6	20.0	18.1	18.0	14.3	22.6
	West	17.5	27.6	20.7	9.3	22.7	17.8	26.7	19.4	20.5	20.2	12.9
Admittance Rate	Under 50	22.2	27.9	27.9	16.3	40.9	24.4	46.7	36.1	41.0	22.7	32.3
	50 to 75	44.4	48.3	51.7	48.8	36.4	46.7	40.0	38.9	35.9	47.1	48.4
	Over 75	33.3	24.1	20.7	34.9	22.7	28.9	13.3	25.0	23.1	30.3	19.4
Undergraduate Enrollment	Small	31.7	27.6	24.1	20.9	15.9	15.6	6.7	15.3	14.1	28.6	12.9
	Medium	19.1	24.1	6.9	20.9	6.8	13.3	0.0	16.7	10.3	21.0	9.7
	Large	19.1	20.7	20.7	20.9	34.1	28.9	13.3	29.2	30.8	20.2	16.1
	Very Large	30.2	27.6	48.3	37.2	43.2	42.2	80.0	38.9	44.9	30.3	61.3

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

Table 4 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. The popularity of the subject and the number of institutions with explicitly stated AP credit and placement policies in our sample 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.

**Table 4: 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
Calculus AB	Mean	2.82	2.82	2.82	0.22*	0.17*	0.55*
	N	2,575	5,124	5,272	1,231	2,286	4,033
Calculus BC	Mean	2.89	2.90	2.90	0.01	0.06	0.58*
	N	1,390	1,002	492	586	1,016	3,298
Computer Science Principles	Mean	2.65	2.94	2.95	0.20*	0.24*	0.59*
	N	878	1,535	1,701	130	195	230
European History	Mean	2.86	2.91	2.94	0.36*	0.69*	0.77*
	N	909	1,103	1,128	321	315	191
German Language and Culture	Mean	3.40	3.25	3.52	0.04	0.57*	0.43*
	N	376	199	130	107	91	61
Physics 1	Mean	3.19	3.18	3.15	0.02	0.31*	0.57*
	N	856	1,209	1,245	1,445	1,848	797
Physics 2	Mean	3.27	3.27	3.10	0.14	0.28*	0.66*
	N	36	206	80	266	219	171
Physics C: Mechanics	Mean	2.98	2.93	2.91	0.17*	0.36*	0.67*
	N	4,908	8,770	11,639	459	1,272	2,581
Physics C: Electricity & Magnetism	Mean	2.99	2.96	2.93	0.36*	0.61*	0.80*
	N	4,260	9,211	13,023	250	584	1,372
Psychology	Mean	3.19	3.17	3.17	0.12*	0.20*	0.47*
	N	9,101	15,083	15,646	1,172	4,071	4,495
Art History	Mean	3.17	3.41	3.59	0.41*	0.29*	0.24*
	N	534	509	346	83	118	61

* P < .05

The course means also vary by subject. The mean grades for the non-AP groups range from 2.65 in Computer Science to 3.59 in Art History. 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. 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.

Appendix A

Identifying Equivalent Courses

AP equivalent courses were identified using a College Board database of AP policies at postsecondary institutions for each year included in the analysis. An AP equivalent course is one for which an AP student receives credit and/or placement as per the institutional policy at her or his 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 the postsecondary institution s/he is attending. Students must also attend an institution that has at least one non-AP student and must not have repeated an equivalent course(s) at his or her 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 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., U.S. 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 non-equivalent 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-AP3, non-AP4, and non-AP5 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 B1: Characteristics of Students in the AP Calculus AB Analyses

		Non AP Comparison Groups			AP Groups			
		3	4	5	3	4	5	
Number of Students		2,575	5,124	5,272	1,231	2,286	4,033	
Gender	Female	33%	29%	30%	48%	40%	35%	
	Male	49%	55%	54%	51%	60%	64%	
	Missing	19%	16%	16%	0%	0%	0%	
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%	
	Asian	12%	14%	15%	30%	27%	32%	
	Black/ African American	4%	4%	4%	4%	2%	1%	
	Hispanic	14%	9%	9%	22%	13%	9%	
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%	
	White	47%	51%	51%	39%	52%	52%	
	Two or More	3%	3%	3%	4%	5%	4%	
	No Response/ Missing	20%	18%	18%	1%	1%	1%	
	High School GPA	A+	12%	14%	14%	13%	17%	27%
		A	32%	33%	33%	43%	45%	48%
A-		21%	21%	20%	26%	25%	17%	
B+		8%	8%	7%	9%	7%	4%	
B		3%	4%	4%	3%	2%	1%	
B-		1%	1%	1%	1%	0%	0%	
C+		0%	0%	0%	0%	0%	0%	
C		0%	0%	0%	0%	0%	0%	
C- or Lower		0%	0%	0%	0%	0%	0%	
Missing	23%	20%	20%	4%	4%	3%		
SAT Composite Score Band	1400-1600	10%	17%	18%	21%	34%	61%	
	1200-1400	34%	40%	40%	55%	48%	24%	
	1000-1200	16%	12%	12%	12%	5%	1%	
	800-1000	1%	1%	1%	0%	0%	0%	
	600-800	0%	0%	0%	0%	0%	0%	
	400-600	0%	0%	0%	0%	0%	0%	
	Missing	38%	31%	31%	13%	13%	14%	
Highest Parental Education	No High School Diploma	4%	2%	2%	7%	4%	3%	
	High School Diploma	13%	11%	11%	21%	15%	11%	
	Associate Degree	4%	4%	4%	5%	5%	3%	
	Bachelor's Degree	32%	33%	33%	35%	39%	36%	
	Graduate Degree	26%	32%	32%	31%	37%	46%	
	Missing	20%	18%	18%	1%	0%	1%	

Table B2: Characteristics of Students in the AP Calculus BC Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		1,390	1,002	492	586	1,016	3,298
Gender	Female	39%	34%	34%	42%	36%	32%
	Male	56%	55%	46%	58%	63%	68%
	Missing	5%	12%	20%	0%	0%	0%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	25%	21%	31%	38%	36%	45%
	Black/ African American	7%	5%	3%	4%	2%	1%
	Hispanic	17%	15%	19%	17%	12%	7%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	41%	41%	22%	35%	45%	41%
	Two or More	4%	4%	3%	4%	3%	5%
	No Response/ Missing	6%	14%	22%	1%	2%	1%
High School GPA	A+	11%	16%	13%	14%	19%	25%
	A	33%	34%	29%	43%	50%	53%
	A-	28%	23%	23%	26%	21%	16%
	B+	13%	7%	6%	5%	4%	2%
	B	4%	2%	3%	1%	1%	0%
	B-	1%	0%	0%	0%	0%	0%
	C+	1%	0%	0%	0%	0%	0%
	C	0%	0%	0%	0%	0%	0%
	C- or Lower	0%	0%	0%	0%	0%	0%
	Missing	9%	17%	25%	5%	6%	4%
SAT Composite Score Band	1400-1600	17%	25%	26%	42%	55%	74%
	1200-1400	50%	38%	37%	35%	27%	11%
	1000-1200	16%	12%	10%	6%	1%	0%
	800-1000	0%	0%	0%	0%	0%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
		Missing	17%	25%	27%	17%	17%
Highest Parental Education	No High School Diploma	4%	3%	4%	4%	3%	2%
	High School Diploma	17%	13%	15%	18%	12%	7%
	Associate Degree	5%	5%	4%	4%	4%	3%
	Bachelor's Degree	34%	31%	26%	31%	35%	30%
	Graduate Degree	33%	35%	27%	42%	46%	57%
		Missing	7%	14%	23%	1%	1%

Table B3: Characteristics of Students in the AP Computer Science Principles Analyses

		Non AP Comparison Groups			AP Groups			
		3	4	5	3	4	5	
Number of Students		878	1,535	1,701	130	195	230	
Gender	Female	21%	30%	29%	28%	25%	21%	
	Male	69%	62%	63%	72%	75%	79%	
	Missing	10%	8%	8%	0%	0%	0%	
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%	
	Asian	35%	37%	36%	28%	25%	27%	
	Black/ African American	7%	5%	5%	5%	1%	0%	
	Hispanic	14%	13%	13%	15%	9%	5%	
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%	
	White	31%	30%	32%	47%	56%	61%	
	Two or More	3%	4%	4%	3%	7%	5%	
	No Response/ Missing	11%	10%	10%	1%	2%	1%	
	High School GPA	A+	8%	19%	18%	14%	18%	25%
		A	27%	34%	33%	30%	41%	45%
A-		23%	18%	19%	31%	23%	18%	
B+		13%	8%	9%	10%	11%	7%	
B		11%	7%	7%	5%	3%	2%	
B-		3%	2%	2%	2%	0%	0%	
C+		1%	1%	0%	0%	0%	0%	
C		0%	0%	0%	2%	0%	0%	
C- or Lower		0%	0%	0%	0%	0%	0%	
Missing		13%	12%	12%	8%	4%	3%	
SAT Composite Score Band	1400-1600	10%	19%	19%	12%	36%	53%	
	1200-1400	42%	28%	30%	48%	43%	28%	
	1000-1200	22%	13%	13%	10%	3%	1%	
	800-1000	3%	2%	2%	0%	0%	0%	
	600-800	0%	0%	0%	0%	0%	0%	
	400-600	0%	0%	0%	0%	0%	0%	
	Missing	23%	38%	37%	30%	18%	18%	
Highest Parental Education	No High School Diploma	10%	8%	7%	5%	5%	4%	
	High School Diploma	20%	16%	16%	23%	15%	8%	
	Associate Degree	6%	4%	4%	5%	5%	3%	
	Bachelor's Degree	32%	27%	29%	32%	34%	39%	
	Graduate Degree	19%	34%	34%	35%	41%	46%	
	Missing	13%	11%	10%	0%	1%	0%	

Table B4: Characteristics of Students in the AP European History Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		909	1,103	1,128	321	315	191
Gender	Female	47%	47%	46%	48%	45%	40%
	Male	50%	50%	51%	51%	55%	60%
	Missing	3%	3%	3%	1%	0%	1%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	2%	2%	2%	4%	8%	9%
	Black/ African						
	American	18%	16%	15%	2%	2%	1%
	Hispanic	8%	9%	9%	12%	11%	8%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	64%	65%	66%	76%	77%	76%
	Two or More	4%	4%	4%	4%	2%	4%
	No Response/ Missing	4%	4%	4%	2%	0%	2%
	High School GPA	A+	5%	5%	5%	10%	13%
A		18%	19%	19%	32%	43%	43%
A-		28%	27%	28%	30%	24%	22%
B+		20%	20%	20%	14%	8%	5%
B		16%	15%	16%	6%	6%	5%
B-		6%	6%	5%	2%	1%	1%
C+		1%	1%	1%	0%	0%	0%
C		0%	0%	0%	0%	0%	0%
C- or Lower		0%	0%	0%	0%	0%	0%
Missing		6%	6%	5%	7%	5%	3%
SAT Composite Score Band	1400-1600	1%	1%	2%	9%	19%	32%
	1200-1400	19%	21%	21%	47%	44%	31%
	1000-1200	49%	46%	46%	15%	6%	4%
	800-1000	8%	8%	8%	1%	1%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
	Missing	22%	23%	23%	28%	30%	32%
	Highest Parental Education	No High School Diploma	1%	1%	1%	1%	1%
High School Diploma		18%	18%	17%	11%	8%	4%
Associate Degree		8%	7%	7%	7%	3%	3%
Bachelor's Degree		42%	41%	41%	42%	37%	31%
Graduate Degree		24%	27%	27%	38%	52%	61%
Missing		7%	7%	7%	1%	0%	1%

Table B5: Characteristics of Students in the AP German Language and Culture Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		376	199	130	107	91	61
Gender	Female	45%	45%	53%	42%	57%	59%
	Male	53%	49%	38%	58%	43%	41%
	Missing	2%	7%	8%	0%	0%	0%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	6%	6%	11%	4%	3%	11%
	Black/ African American	2%	2%	3%	1%	1%	0%
	Hispanic	6%	8%	10%	1%	7%	0%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	78%	69%	62%	90%	86%	80%
	Two or More	6%	8%	4%	4%	2%	7%
	No Response/ Missing	2%	8%	11%	1%	1%	2%
High School GPA	A+	14%	17%	15%	16%	18%	43%
	A	35%	32%	31%	34%	46%	44%
	A-	20%	20%	20%	26%	21%	7%
	B+	13%	12%	15%	4%	7%	5%
	B	7%	8%	5%	7%	3%	0%
	B-	2%	1%	2%	4%	0%	0%
	C+	1%	1%	0%	0%	0%	0%
	C	0%	0%	1%	0%	0%	0%
	C- or Lower Missing	0% 9%	0% 11%	0% 12%	0% 9%	0% 5%	0% 2%
SAT Composite Score Band	1400-1600	13%	12%	24%	17%	26%	49%
	1200-1400	37%	33%	28%	37%	33%	25%
	1000-1200	19%	21%	15%	9%	4%	0%
	800-1000	1%	0%	2%	1%	0%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
	Missing	30%	34%	32%	36%	36%	26%
		No High School Diploma	2%	3%	3%	0%	1%
Highest Parental Education	High School Diploma	14%	11%	9%	9%	7%	10%
	Associate Degree	5%	5%	2%	4%	2%	0%
	Bachelor's Degree	37%	33%	32%	47%	32%	30%
	Graduate Degree	39%	41%	41%	39%	58%	61%
	Missing	3%	9%	13%	1%	0%	0%

Table B6: Characteristics of Students in the AP Physics 1 Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		856	1,209	1,245	1,445	1,848	797
Gender	Female	57%	57%	54%	23%	20%	12%
	Male	41%	41%	44%	77%	80%	88%
	Missing	2%	2%	3%	0%	0%	0%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	12%	15%	14%	12%	14%	17%
	Black/ African American	5%	4%	4%	2%	2%	1%
	Hispanic	11%	10%	10%	12%	8%	6%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	67%	65%	65%	70%	71%	70%
	Two or More	2%	2%	2%	4%	4%	4%
	No Response/ Missing	3%	3%	4%	1%	1%	1%
High School GPA	A+	20%	21%	20%	22%	29%	40%
	A	41%	43%	41%	41%	45%	44%
	A-	18%	18%	19%	23%	16%	11%
	B+	8%	8%	8%	7%	5%	2%
	B	4%	3%	4%	3%	2%	1%
	B-	1%	1%	1%	1%	1%	0%
	C+	0%	0%	0%	0%	0%	0%
	C	0%	0%	0%	0%	0%	0%
	C- or Lower	0%	0%	0%	0%	0%	0%
	Missing	6%	7%	7%	3%	3%	2%
SAT Composite Score Band	1400-1600	12%	14%	13%	24%	48%	68%
	1200-1400	37%	39%	39%	47%	26%	7%
	1000-1200	18%	15%	17%	3%	0%	0%
	800-1000	2%	1%	1%	0%	0%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
	Missing	32%	32%	31%	26%	25%	24%
Highest Parental Education	No High School Diploma	1%	1%	1%	1%	1%	1%
	High School Diploma	14%	13%	14%	10%	8%	3%
	Associate Degree	5%	5%	6%	4%	4%	3%
	Bachelor's Degree	39%	39%	39%	46%	41%	34%
	Graduate Degree	35%	38%	36%	39%	46%	59%
	Missing	4%	4%	4%	0%	0%	0%

Table B7: Characteristics of Students in the AP Physics 2 Analyses

		Non AP Comparison Groups			AP Groups			
		3	4	5	3	4	5	
Number of Students		36	206	80	266	219	171	
Gender	Female	44%	56%	45%	24%	21%	12%	
	Male	53%	40%	49%	76%	79%	88%	
	Missing	3%	4%	6%	0%	0%	0%	
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%	
	Asian	11%	25%	34%	17%	24%	30%	
	Black/ African American	6%	3%	4%	3%	2%	2%	
	Hispanic	8%	5%	6%	9%	5%	6%	
	Native Hawaiian/ Pacific Islander	0%	1%	3%	0%	0%	0%	
	White	69%	59%	43%	66%	65%	55%	
	Two or More	3%	2%	4%	5%	4%	6%	
	No Response/ Missing	3%	5%	8%	1%	1%	1%	
	High School GPA	A+	39%	28%	30%	19%	32%	39%
		A	17%	39%	26%	48%	47%	46%
A-		22%	17%	21%	23%	13%	10%	
B+		6%	5%	4%	4%	1%	1%	
B		11%	2%	5%	2%	2%	1%	
B-		0%	0%	0%	0%	0%	0%	
C+		0%	0%	0%	0%	0%	0%	
C		0%	0%	0%	0%	0%	0%	
C- or Lower		0%	0%	0%	0%	0%	0%	
Missing	6%	8%	14%	4%	5%	4%		
SAT Composite Score Band	1400-1600	22%	21%	19%	37%	55%	65%	
	1200-1400	44%	45%	39%	36%	16%	5%	
	1000-1200	19%	9%	18%	1%	0%	1%	
	800-1000	3%	0%	1%	0%	0%	0%	
	600-800	0%	0%	0%	0%	0%	0%	
	400-600	0%	0%	0%	0%	0%	0%	
	Missing	11%	25%	24%	26%	29%	29%	
	Highest Parental Education	No High School Diploma	0%	0%	1%	0%	1%	1%
High School Diploma		19%	10%	18%	8%	5%	5%	
Associate Degree		8%	6%	8%	6%	0%	3%	
Bachelor's Degree		50%	38%	36%	39%	37%	32%	
Graduate Degree		17%	40%	28%	47%	55%	60%	
Missing		6%	6%	10%	0%	1%	1%	

Table B8: Characteristics of Students in the AP Physics C: M Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		4,908	8,770	11,639	459	1,272	2,581
Gender	Female	35%	30%	29%	29%	24%	16%
	Male	62%	67%	67%	71%	76%	83%
	Missing	3%	4%	4%	0%	0%	0%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	19%	18%	18%	30%	32%	36%
	Black/ African American	2%	3%	3%	1%	2%	1%
	Hispanic	13%	14%	13%	13%	10%	5%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	58%	56%	58%	51%	51%	52%
	Two or More	4%	4%	4%	4%	4%	5%
	No Response/ Missing	4%	5%	5%	1%	1%	1%
High School GPA	A+	17%	18%	19%	15%	20%	27%
	A	43%	42%	42%	48%	48%	48%
	A-	22%	21%	21%	26%	20%	17%
	B+	8%	8%	7%	6%	5%	3%
	B	3%	3%	2%	3%	2%	1%
	B-	1%	1%	1%	0%	0%	0%
	C+	0%	0%	0%	0%	0%	0%
	C	0%	0%	0%	0%	0%	0%
	C- or Lower	0%	0%	0%	0%	0%	0%
	Missing	8%	9%	8%	2%	5%	4%
SAT Composite Score Band	1400-1600	16%	22%	24%	31%	44%	56%
	1200-1400	37%	38%	38%	47%	28%	9%
	1000-1200	11%	8%	7%	3%	1%	0%
	800-1000	0%	0%	0%	0%	0%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
	Missing	36%	32%	30%	19%	27%	35%
Highest Parental Education	No High School Diploma	3%	4%	3%	3%	3%	1%
	High School Diploma	14%	13%	12%	14%	11%	6%
	Associate Degree	5%	5%	4%	6%	4%	2%
	Bachelor's Degree	39%	38%	38%	44%	38%	32%
	Graduate Degree	34%	35%	38%	32%	44%	58%
	Missing	5%	5%	5%	0%	0%	1%

Table B9: Characteristics of Students in the AP Physics C: E&M Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		4,260	9,211	13,023	250	584	1,372
Gender	Female	32%	27%	27%	14%	23%	13%
	Male	65%	69%	69%	86%	77%	87%
	Missing	3%	4%	4%	0%	0%	0%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	16%	18%	19%	26%	28%	37%
	Black/ African American	3%	3%	2%	2%	2%	1%
	Hispanic	12%	13%	12%	9%	10%	6%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	62%	57%	57%	56%	54%	49%
	Two or More	3%	4%	4%	6%	4%	6%
	No Response/ Missing	4%	5%	5%	1%	1%	1%
High School GPA	A+	18%	19%	20%	14%	25%	27%
	A	43%	42%	42%	47%	45%	49%
	A-	20%	20%	20%	24%	18%	16%
	B+	7%	7%	7%	7%	7%	3%
	B	3%	3%	2%	3%	1%	1%
	B-	1%	0%	0%	0%	0%	0%
	C+	0%	0%	0%	0%	0%	0%
	C	0%	0%	0%	0%	0%	0%
	C- or Lower	0%	0%	0%	0%	0%	0%
	Missing	7%	9%	8%	4%	4%	4%
SAT Composite Score Band	1400-1600	16%	24%	27%	48%	58%	68%
	1200-1400	37%	38%	38%	32%	20%	6%
	1000-1200	11%	8%	7%	3%	0%	0%
	800-1000	0%	0%	0%	0%	0%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
	Missing	36%	30%	28%	17%	22%	26%
Highest Parental Education	No High School Diploma	3%	3%	3%	2%	1%	1%
	High School Diploma	14%	12%	12%	8%	8%	5%
	Associate Degree	5%	5%	4%	2%	3%	1%
	Bachelor's Degree	40%	39%	37%	37%	41%	31%
	Graduate Degree	34%	36%	39%	51%	48%	62%
	Missing	4%	5%	5%	0%	0%	1%

Table B10: Characteristics of Students in the AP Psychology Analyses

		Non AP Comparison Groups			AP Groups		
		3	4	5	3	4	5
Number of Students		9,101	15,083	15,646	1,172	4,071	4,495
Gender	Female	78%	75%	75%	81%	79%	80%
	Male	17%	19%	19%	19%	21%	20%
	Missing	5%	6%	6%	0%	0%	0%
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	0%
	Asian	5%	9%	9%	8%	19%	24%
	Black/ African American	7%	6%	6%	6%	4%	2%
	Hispanic	17%	16%	16%	11%	14%	10%
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%
	White	61%	58%	57%	70%	59%	59%
	Two or More	3%	3%	3%	4%	4%	5%
	No Response/ Missing	6%	7%	7%	1%	1%	1%
	High School GPA						
	A+	9%	10%	10%	6%	10%	19%
	A	27%	29%	29%	29%	36%	46%
	A-	23%	23%	23%	30%	29%	21%
	B+	16%	15%	14%	16%	11%	6%
	B	10%	9%	8%	8%	5%	2%
	B-	4%	3%	3%	2%	1%	0%
	C+	1%	1%	1%	1%	0%	0%
	C	0%	0%	0%	0%	0%	0%
	C- or Lower	0%	0%	0%	1%	0%	0%
	Missing	9%	11%	11%	6%	7%	5%
SAT Composite Score Band	1400-1600	2%	5%	5%	2%	9%	24%
	1200-1400	21%	25%	25%	33%	43%	37%
	1000-1200	40%	33%	32%	38%	18%	6%
	800-1000	12%	9%	9%	2%	1%	0%
	600-800	0%	0%	0%	0%	0%	0%
	400-600	0%	0%	0%	0%	0%	0%
	Missing	25%	28%	28%	25%	30%	33%
	Highest Parental Education						
	No High School Diploma	4%	4%	4%	3%	3%	2%
	High School Diploma	23%	21%	20%	15%	16%	12%
	Associate Degree	8%	7%	7%	8%	6%	4%
	Bachelor's Degree	35%	33%	33%	44%	40%	37%
	Graduate Degree	23%	27%	27%	30%	35%	44%
	Missing	7%	8%	8%	1%	0%	0%

Table B11: Characteristics of Students in the AP Art History Analyses

		Non AP Comparison Groups			AP Groups			
		3	4	5	3	4	5	
Number of Students		534	509	346	83	118	61	
Gender	Female	62%	80%	79%	82%	81%	80%	
	Male	31%	16%	16%	18%	19%	20%	
	Missing	7%	4%	5%	0%	1%	0%	
Race/ Ethnicity	American Indian	0%	0%	0%	0%	0%	2%	
	Asian	6%	9%	13%	18%	8%	10%	
	Black/ African American	2%	6%	3%	1%	2%	2%	
	Hispanic	9%	13%	8%	24%	17%	11%	
	Native Hawaiian/ Pacific Islander	0%	0%	0%	0%	0%	0%	
	White	68%	62%	66%	49%	64%	70%	
	Two or More	5%	4%	3%	7%	8%	5%	
	No Response/ Missing	10%	6%	7%	0%	2%	0%	
	High School GPA	A+	7%	9%	11%	12%	13%	15%
		A	24%	40%	47%	37%	39%	52%
A-		28%	26%	26%	18%	33%	20%	
B+		14%	11%	6%	19%	8%	7%	
B		9%	5%	2%	6%	3%	0%	
B-		2%	2%	1%	1%	1%	0%	
C+		1%	0%	0%	0%	0%	0%	
C		0%	0%	0%	0%	0%	0%	
C- or Lower		0%	0%	0%	0%	0%	0%	
Missing	14%	7%	8%	6%	4%	7%		
SAT Composite Score Band	1400-1600	2%	5%	9%	11%	8%	28%	
	1200-1400	24%	35%	41%	47%	42%	31%	
	1000-1200	29%	31%	18%	16%	15%	5%	
	800-1000	4%	2%	1%	0%	1%	0%	
	600-800	0%	0%	0%	0%	0%	0%	
	400-600	0%	0%	0%	0%	0%	0%	
	Missing	41%	27%	30%	27%	33%	36%	
Highest Parental Education	No High School Diploma	1%	2%	2%	6%	3%	2%	
	High School Diploma	13%	16%	13%	24%	12%	10%	
	Associate Degree	7%	6%	5%	5%	3%	3%	
	Bachelor's Degree	43%	42%	38%	29%	39%	38%	
	Graduate Degree	27%	28%	35%	35%	43%	46%	
	Missing	10%	6%	7%	1%	1%	2%	

Bibliography/References

Patterson, B. F., & Mattern, K. D. (2012). *Validity of the SAT for Predicting First-Year Grades: 2009 SAT Validity Sample* (College Board Statistical Report No. 2012-2). New York: The College Board. Retrieved from College Board website: <https://files.eric.ed.gov/fulltext/ED563103.pdf>

Wyatt, J., Jagesic, S., & Godfrey, K. Godfrey (2018). *Postsecondary Course Performance of AP Exam Takers in Subsequent Coursework*. (College Board Validity Report). New York: The College Board. Retrieved from College Board website: <https://files.eric.ed.gov/fulltext/ED582570.pdf>

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