Predicting Success on Advanced Placement Exams using ACT Aspire, PreACT, and ACT Test Scores

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ACT®

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Acknowledgements

The authors would like to thank the staff of the Arkansas Department of Education for providing much of the data that was used for this study.

Abstract

We examined how ACT® Aspire® (from grades 8 to 10), PreACT® (from grade 10), and ACT® test scores (from grades 10 and 11) relate to students' chances of scoring a 3 or higher as well as 4 or higher on selected Advanced Placement (AP) exams. Data for the study was available for 49,220 students from 318 high schools who had taken at least one AP exam in May of 2015 through May of 2019 and had taken ACT Aspire, PreACT, or the ACT test prior to taking the AP exam. Ninety-seven percent of the students came from a single state. The typical sample size for analysis per AP course was 3,643 students. The sample was weighted to resemble the national AP test-taking population on the AP exam score distribution. Weighted logistic regression models were estimated to relate test scores to AP exam success, while adjusting for time between the testing events and the grade level when the AP exam was taken. Moderate to strong positive correlations for ACT Aspire, PreACT, and ACT test scores were found with AP exam scores; all correlations were .50 or higher. Recommended cut scores associated with approximately a 50% chance of success were derived for 23 of the 38 AP courses available—the same courses for which expectancy tables based on PSAT/SAT test scores are reported by College Board as part of AP Potential. Separate cut scores for fall and spring testing with ACT Aspire, PreACT, or the ACT test were developed. Given that ACT Aspire, PreACT, and the ACT are often administered in early high school and AP courses are typically taken in grades 11 or 12, scores from these assessments are well timed to assist schools, educators, and parents in combination with other readiness measures (e.g., high school coursework taken, high school grades, academic discipline) with assessing students' readiness for rigorous coursework and success on AP exams.

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Introduction

Many schools, districts, and states administer ACT Aspire (grades 3 to 10), PreACT (grades 8 to 10), and/or the ACT test (grades 10 to 12) for school accountability purposes and to measure the progress their students are making towards becoming college and career ready. Given that these assessments are often administered in early high school, there is an interest in using students' scores from these tests to help identify those who are academically prepared and may benefit from some of the more rigorous courses offered in high schools across the nation. The goal of these more advanced courses is to academically prepare students for their post-high school plans and to provide opportunities for students to earn college credit for college-level work done in high school. Such courses include dual or concurrent enrollment courses (ACT, 2015b), Post-Secondary Enrollment Options, International Baccalaureate (IB), and Advanced Placement (AP; Warne, Larsen, Anderson, & Odasso, 2015).

For AP and IB courses, students are generally required to perform at a certain threshold on an end-of-course exam to earn college credit. For example, AP exams, which are the focus of the current study, assess students' mastery of the material covered in the corresponding AP course and are graded on a 5-point scale: 1 (no recommendation), 2 (possibly qualified), 3 (qualified), 4 (well qualified), and 5 (extremely well qualified). Generally, students who earn AP exam scores of 3 or higher are considered qualified to receive college credit and/or to be placed into advanced courses. However, this decision is determined by each college or university; in many instances, colleges require AP exam scores of 4 or higher in order for students to receive college credit for the course. Currently, there are 38 AP courses and exams available. Students typically take most AP courses during their junior and senior years in high school (College Board, 2018a)—though there are a few AP courses that are more predominantly taken by high school students in earlier grades (College Board, 2018a; Zhang, Patel, & Ewing, 2014b).

More than ten years ago, ACT (2009) conducted a study that examined the relationships between ACT Plan® test scores from grade 10 and scores on selected AP exams. Results from the study showed that ACT Plan scores were good predictors of success on AP exams and could be used to help identify students who are likely to succeed on AP exams. In 2014, ACT Plan was retired and replaced with two alternative assessments: ACT Aspire®, which became operational in spring 2014 to provide schools with a vertically-aligned assessment program that begins as early as grade 3 and extends through early high school, and the PreACT that became operational in fall 2016 and simulates the ACT testing experience with a shorter test. Following the launch of ACT Aspire, a preliminary linkage between ACT Aspire scores and success on selected AP exams was published based on the ACT Plan-ACT Aspire concordance and the previously derived ACT Plan cut scores (Radunzel, Mattern, & Allen, 2015).

Given that AP courses and exams periodically undergo redesigns (College Board, 2020a), there is interest in directly relating scores on ACT Aspire, PreACT, and the ACT to the likelihood of succeeding on AP exams for more recent cohorts of students. The current study explored this topic and found that students' scores from these assessments are good predictors of success in AP courses taken in the subsequent academic year. Success was defined two ways: (a) receiving a score of 3 or higher,

and (b) receiving a score of 4 or higher, on the specific AP exam. As part of the current study, new score linkages were developed for AP courses that align in curricular content with ACT Aspire, PreACT, and ACT tests. The updated cut scores derived from these new linkages should replace those previously published that were based on ACT Plan (i.e., ACT, 2009; Radunzel, et al., 2015). Findings from the current study suggest that the administration of ACT Aspire, PreACT, and the ACT as part of state and district testing programs are well timed to assist schools, educators, and parents with assessing students' readiness for rigorous coursework and success on AP exams.

Data and Methods

Data Source

The sample was comprised of 49,220 students from 318 high schools who had taken at least one AP exam in May of 2015 through May of 2019 and had taken ACT Aspire, PreACT, or the ACT test seven to 20 months prior to taking the AP exam (that is, the student took one of the three assessments in the prior academic year or in September or October of the same academic year when the AP exam was taken in May). Ninety-seven percent of the students came from a single state located in the southern U.S. census region. The mean number of AP exams taken by students was 1.7. Fifty-nine percent had taken a single AP exam, 23% had taken two AP exams, and 18% had taken three or more AP exams. Table 1 provides information on the gender, racial/ethnic, and economic disadvantaged status composition of the samples. A more detailed description for each course is provided in the results section (see Tables A1 to A3 in the Appendix).

Table 1. Description of Sample

Characteristic	N or %
Sample size (count)	49,220
Number of schools (count)	318
Number of districts (count)	252
Gender (%)	
Male	39.7
Female	60.2
Unknown	< 0.1
Race/ethnicity (%)	
African American	13.2
American Indian	0.6
Asian American	2.9
Hispanic	9.7
Pacific Islander/Native Hawaiian	0.2
White	71.5
Multiracial	1.9
Unknown	< 0.1
Economically disadvantaged (%)	
Yes	34.7
No	65.2
Unknown	< 0.1
Number of AP exams taken (%)	
One	59.0
Two	22.6
Three or more	18.4
Number of AP exams taken (mean)	1.7

Note. Economically disadvantaged was defined by meeting one of the following two criteria: eligible for free or reduced lunch or self-reporting an annual family income of less than $36,000.

Measures

AP exam scores. AP exam scores range from 1 to 5. Based on AP exam scores, the following two success outcomes were examined: (a) earning a 3 or higher AP exam score and (b) earning a 4 or higher AP exam score.

ACT Aspire, PreACT, and ACT test scores. The ACT Aspire Summative Assessments measure student progress in English, math, reading, science, and writing (ACT, 2019a). The tests are grade-level specific for grades 3 through early high school (grade 9 and 10). Other than writing, the tests are vertically scaled and scale scores are reported on a scale from 400 to a maximum score that varies across subjects and grades (e.g., 429 for reading grade 3 to 460 for math early high school). ACT Aspire Summative Assessments include multiple-choice, technology enhanced, and constructed-response item types, as well as a writing task (if the writing test is taken). The state that provided

the majority of data for this study first began administering ACT Aspire to students in grades 3 through 10 in spring 2016.

The ACT test measures student achievement in English, math, reading, science, and writing (ACT, 2019b). The tests are oriented towards the general content areas of college and high school instructional programs. The tests are intended for students in grade 11 and 12, though students in earlier grades also take the ACT for placement and talent identification purposes. Scale scores are reported on a 1–36 scale for all subjects except writing. The ACT test uses multiple-choice items and a writing task (if the writing test is taken). The PreACT test is designed to be similar to the ACT test but is targeted to the general population of 10th-grade students and does not include a writing test (ACT, 2019c). PreACT and ACT scores are aligned to a common scale with ACT scores ranging from 1 to 36 and PreACT scores ranging from 1 to 35.

The philosophical basis of the ACT Aspire, PreACT, and ACT tests are similar, and the design of all three tests is informed by the ACT National Curriculum Survey (ACT, 2016). All three tests report Composite (average of the English, math, reading, and science scores) and STEM scores (average of the math and science scores). ACT Aspire and the ACT test also report English Language Arts (ELA) scores (average of the English, reading, and writing scores). Because PreACT does not report an ELA score, we compute the sum of the English and reading scores and include that as an alternative ELA measure (denoted E+R).

Methods

Courses. Analyses were conducted at the course level. To maximize the sample size available per course, ACT Aspire scores were converted to PreACT/ACT scores using the recently developed concordance between ACT Aspire and PreACT/ACT test scores (see Table 4 from Allen & Tao, 2020). Test scores on the PreACT/ACT score scale were then examined in relation to AP exam success. In this paper, we refer to the collection of PreACT, ACT, and concorded ACT Aspire scores generically as **test scores**. Given that the writing test is optional for the ACT test, not all students with E+R scores had ELA scores. Because we wanted the course analyses to be conducted on the same sample of students across the various test scores and avoid analyses leading to different cut scores as a result of different samples being used, ACT ELA scores were estimated for students who had not taken the writing test based on a concordance developed between ACT E+R and ACT ELA scores (the concordance can be made available upon request).[1] If a student took multiple assessments in a given academic year, only scores from the earliest administration were used in the analyses.

The years included in the analyses varied by course. The reason for this is that AP courses and exams periodically undergo redesigns (College Board, 2020a). In the course-specific analyses, only the exam years following the redesign were included (reported in Tables A1 to A3 in the Appendix). For example, Calculus AB was redesigned for the 2016-2017 academic year. Therefore, only students who took the AP Calculus AB exam in May of 2017, 2018, or 2019 were included in the course analyses. The two exceptions to this included AP United States Government and Politics, which was recently redesigned in 2018-2019, and AP World History, which was redesigned to AP World History Modern in 2019-2020. Results for these two courses are based on earlier years prior to their most

recent redesigns because post-redesign data were not available for AP World History, and there was insufficient sample sizes to run analyses on post-redesign data for AP United States Government and Politics.

Cut scores are provided for 23 of the 38 AP courses that had sufficient samples sizes and moderate-to-high correlations with test scores along with consideration of typical course progression/sequencing. In particular, empirically-derived results based on the current study sample are not provided for the following nine AP courses due to the smaller sample sizes (fewer than 300 students): AP Capstone Research, AP Chinese Language and Culture, AP Comparative Government and Politics, AP Computer Science Principles, AP German Language and Culture, AP French Language and Culture, AP Italian Language and Culture, AP Japanese Language and Culture, and AP Latin. We note that despite AP Physics C: Electricity and Magnetism being based on a sample of fewer than 100 students, we report empirically-derived cut scores for this course as the results from the course analyses supported this decision (to be discussed later).

Additionally, due to low correlations with test scores, results are not provided for the following five courses: AP Spanish Language and Culture, AP Spanish Literature and Culture, AP 2-D Art and Design, AP 3-D Art and Design, and AP Drawing. Finally, recommended cut scores are also not provided for AP Calculus BC, AP Physics 2, and AP Seminar given preliminary results and/or consideration of typical course progression/sequencing. The reason for not including AP Calculus BC is that the derived PreACT/ACT cut scores were slightly lower for Calculus BC than for AP Calculus AB even though Calculus BC is equivalent to one year of calculus at most colleges and universities, while Calculus AB is generally equivalent to a semester of calculus. The reason for not including Physics 2 is that AP Physics 1 or a comparable introductory course in physics is a recommended prerequisite for AP Physics 2. The reason for not including AP Seminar is that it is one of the courses included in the AP Capstone diploma program; the other course that is a part of this program is AP Research for which the sample size was too small for analysis in this study. We note that expectancy tables relating PSAT/SAT scores to AP exam success are not provided for 15 of these same 17 courses (College Board, 2020b). The two exceptions are AP Computer Science Principles and AP Comparative Government and Politics. Unfortunately, our matched sample for AP Computer Science Principles only included 4 students during the years examined. For AP Comparative Government and Politics, besides the relatively smaller sample size (n = 281), there were other issues with the data. As will be discussed in more detail later, for these two courses, we recommend using Composite scores that concord to the reported PSAT/SAT Total scores associated with a 50% chance of AP exam success (College Board, 2020b).

Weighting. The sample sizes per course, along with the mean AP exam score and percentages achieving the success outcomes, are reported in Table 2 (see results under Unweighted analyses columns). Given that most of the data came from a single state, we compared these means and percentages to those reported for the 2018 AP test-taking population (College Board, 2018b). From these comparisons, we found that students in the current sample tended to earn lower AP exam scores on average and to be substantially less likely to earn a 3 or higher score, or a 4 or higher score, than the AP referent population. To help generalize from state-specific results to the

national AP test taking population, weights were applied in the analyses so that the AP score distribution for the study sample resembled that of the AP referent population (see corresponding results under Weighted analyses columns in Table 2); weights were defined as the percentage of students in the referent population achieving a specific AP exam score in the course divided by the corresponding percentage of students in the study sample achieving the specific AP score.

Table 2. Summary of AP Exam Success for Study Sample

		Unweighted analyses			Weighted analyses		
AP Course	N	Average (SD)	Pct. 3 or higher	Pct. 4 or higher	Average (SD)	Pct. 3 or higher	Pct. 4 or higher
ELA-related							
English Lang. and Composition	22,044	2.2 (1.1)	34.3	13.0	2.8 (1.2)	57.2	28.3
English Lit. and Composition	21,227	2.1 (1.0)	29.2	9.4	2.6 (1.1)	47.3	20.2
European History	1,025	2.4 (1.2)	41.4	19.7	2.9 (1.2)	57.7	31.8
Human Geography	3,245	2.6 (1.4)	49.8	29.9	2.7 (1.4)	54.4	32.9
Psychology	6,813	2.6 (1.4)	51.2	31.4	3.1 (1.4)	65.5	47.4
United States Govt and Politics	5,050	2.3 (1.2)	40.0	17.3	2.7 (1.3)	52.9	26.5
United States History	15,669	1.9 (1.1)	26.1	11.9	2.7 (1.3)	51.8	29.1
World History	8,675	2.2 (1.1)	35.1	14.2	2.8 (1.2)	56.2	28.8
STEM-related							
Biology	8,478	2.2 (1.0)	35.7	10.1	2.9 (1.1)	61.5	28.8
Calculus AB	3,983	2.3 (1.3)	38.9	19.7	2.9 (1.4)	57.7	36.8
Chemistry	5,157	1.8 (1.0)	22.7	8.3	2.8 (1.3)	55.8	30.8
Computer Science A	1,091	2.1 (1.3)	34.8	17.5	3.2 (1.5)	67.7	45.9
Environmental Science	3,643	2.0 (1.2)	29.2	18.3	2.6 (1.3)	47.6	32.6
Macroeconomics	978	2.5 (1.4)	46.4	28.9	3.0 (1.5)	58.5	42.3
Microeconomics	911	2.7 (1.3)	54.1	30.4	3.2 (1.4)	67.9	48.8
Physics 1	3,628	1.8 (0.9)	19.4	6.7	2.4 (1.2)	40.7	21.1
Physics C: Elect. and Magnetism	100	3.2 (1.4)	62.0	47.0	3.6 (1.4)	73.4	59.9
Physics C: Mechanics	413	3.0 (1.3)	60.8	38.3	3.6 (1.3)	77.3	57.6
Statistics	6,002	2.1 (1.2)	34.0	14.9	2.9 (1.4)	60.7	35.7
Other							
Art History	734	2.5 (1.1)	47.4	19.2	3.0 (1.2)	64.6	37.2
Music Theory	1,078	2.5 (1.2)	43.6	20.7	3.2 (1.3)	65.8	41.3

Note. Weights were defined as the percentage of students in the referent population achieving a specific AP exam score in the course divided by the corresponding percentage of students in the study sample achieving the specific AP score. SD = standard deviation. Pct. = percent.

Correlations. Pearson correlation coefficients were used to measure the strength of the linear relationship between test scores (PreACT, ACT, and concorded ACT Aspire) and AP exam scores. For each course, correlations were examined in relation to content-relevant scores and the Composite score. For the English and social science-related AP courses, the maximum correlation generally occurred with either the ELA score or E+R score. Likewise, for the math and science-related AP courses, the maximum correlation generally occurred with the STEM score. For two courses (AP Art History and AP Music Theory), the correlation was generally found to be the highest for the Composite score. These results are consistent with those found in our earlier study where ACT Plan scores were examined in relation to AP exam scores (ACT, 2009). For this reason, we used the ELA (and E+R) and STEM scores for predicting AP success in content-relevant courses, and the Composite score for AP Art History and AP Music Theory. The correlations are presented in the Results section.

Models. Weighted logistic regression was used to predict students' chances of success on the specific AP exam based on their test scores. For most courses, the models accounted for the time in months between testing events (ACT Aspire, PreACT, or ACT test vs. AP exam), an indicator for the grade level when the AP exam was taken, and their interactions with students' test scores.

The time in months between testing events was included in the model to account for the inclusion of a wide range of instructional time between testing events (from 7 to 20 months; Camara & Allen, 2017). Time in months was not included in the models for the following AP courses: AP Human Geography, AP Calculus AB, AP Computer Science A, AP Physics 1, and AP Art History. For these courses, the inclusion of time in months did not lead to meaningful results when comparing fall and spring testing events (e.g., the probability distributions for spring and fall testing crisscrossed and/or the spring cut score was estimated to be lower than the fall cut score), and time in months was not a significant predictor.

Grade level was included in the models to statistically control for differences in this variable between the study sample and the AP referent population (College Board, 2018a). For 11 out of the 21 courses analyzed, the study samples tended to include a higher percentage of students taking the AP courses during grade 12 (by 10 or more percentage points) than what was reported for the AP referent population (compare Tables A1 to A3 in the Appendix to table presented in College Board, 2018a).[2] The dichotomous grade level indicator was generally coded as one when the AP course was taken in grade 12 and zero otherwise. There were a few exceptions to this for courses that tended to be more predominantly taken by ninth- and tenth-graders instead of 11th and 12th graders: AP European History, AP Human Geography, and AP World History (College Board, 2018a). For these courses, the grade level indicator was coded as one when the AP course was taken in grade 11 or 12 and zero otherwise.

To assist with assessing the fit of the model, the pseudo-R^2 and the classification accuracy were reported. The pseudo-R^2 indicates how much of the variability in the outcome can be accounted for by the logistic model. The classification accuracy gives a sense of the number of correct predictions being made by the model using a probability of 0.50 or higher to classify those as likely to achieve the AP exam success outcome, and those below it as not likely to achieve the outcome.

Development of cut scores. Based on the models, we identified the test scores corresponding to approximately a 50% chance of earning a 3 or higher AP score and a 4 or higher AP score. Cut scores are reported for fall testing at 19 months (corresponding with taking the ACT assessment in October of the prior academic year of when the AP exam was taken) and spring testing at 14 months (corresponding with taking the ACT assessment in March of the prior academic year of when the AP exam was taken). For courses where the number of months was not included in the model, the fall and spring cut scores were set to be the same value.

The reported cut scores and probabilities of success for each course were derived by taking the weighted average of the cut scores and probabilities calculated per grade level (e.g., grade 12 vs. prior to grade 12) according to the grade level distribution for the AP referent population (among those reporting grade level and being a high school student). More specifically, the reported cut score was estimated by summing the proportion of the AP test-taking population in grade 12 times the estimated cut score for grade 12 and the proportion of the AP test-taking population in earlier grades times the corresponding estimated cut score. For reference, the score associated with a 50% chance can be found by dividing the intercept by the score slope and multiplying by negative one. Cut scores were rounded to the nearest integer to correspond to a possible test score value.

The analysis was based on test scores that were placed on the PreACT/ACT score scale. ACT Aspire cut scores associated with likely success on an AP exam were estimated from the derived PreACT/ACT cut scores using the recently developed concordance between PreACT/ACT test scores and ACT Aspire scores (see Table 3 from Allen & Tao, 2020). To provide evidence supporting the use of combining the scores from multiple assessments in the analyses, we report the following statistics by test source sample (PreACT/ACT vs. ACT Aspire): correlation coefficients between test scores and AP exam scores, the classification accuracy, and the average residuals defined as the observed AP exam success outcome minus the predicted outcome.

Supplemental validation analyses. To validate the techniques utilized in this study (e.g., weighting and adjusting for grade level) to obtain the cut scores associated with success on an AP exam, the proposed fall PreACT/ACT cut scores were compared to those reported based on PSAT/SAT scores as part of AP Potential (College Board, 2020b). These comparisons were made using the ACT/SAT concordance tables (College Board & ACT, 2018). Given that the cut scores were found to be similar to those reported for the PSAT/SAT test scores, we provide concorded PreACT/ACT and ACT Aspire cut scores for two courses for which we were unable to provide empirically-derived cut scores based on the current study sample: AP Comparative Government and Politics and AP Computer Science Principles.

Results

Descriptive Statistics and Correlations

Tables A1 to A3 in the Appendix provide descriptive statistics on the AP course samples after applying the weighting. The following student characteristics are summarized in these tables: grade level of when the AP exam was taken, gender, race/ethnicity, economically-disadvantaged status, year AP exam was taken, test score source (PreACT/ACT vs. ACT Aspire), and the number of months between ACT and AP testing. For the ELA-related course samples, the typical percentage of students who had taken the PreACT or the ACT test in the prior year instead of the ACT Aspire test was 72%; the percentage ranged from 22.5% (AP World History) to 95.1% (AP European History). The corresponding typical percentage for the STEM-related course samples was 88.0%; the percentage ranged from 70.2% (AP Physics 1) to 98.6% (AP Physics C: Electricity and Magnetism). The typical average number of months between testing events across the AP courses was 14 months.

Average test scores by course are shown in Table 3 based on unweighted and weighted analyses. Average test scores for the current sample were considerably higher than those reported for the 2018 ACT-tested high school graduating class, especially after the weighting was applied (ACT, 2018; average ACT ELA score of 19.9, average ACT STEM score of 20.9; and average ACT Composite score of 20.2).

Moderate to strong positive correlations were found between test scores and AP scores (Table 3). Weighting generally improved the strength of the relationships. For the ELA-related courses, the weighted correlations ranged from .57 (AP Human Geography) to .73 (AP English Literature and Composition) for the E+R score and from .56 (AP Human Geography) to .72 (AP English Language and Composition) for the ELA score. For the STEM-related courses, the weighted correlations ranged from .59 (AP Physics C: Mechanics) to .73 (AP Biology) for the STEM score. For Art History and Music Theory, the weighted correlations were .50 and .56, respectively.

Table 3. Average Scores and Correlations between Test Scores and AP Exam Scores

AP Course	N	Score	Unweighted analyses		Weighted analyses	
			Average Score (SD)	Correlation	Average Score (SD)	Correlation
ELA-related						
English Lang. and Composition.	22,044	E+R	44.4 (10.1)	.69	48.3 (10.5)	.71
		ELA	20.8 (4.4)	.70	22.5 (4.5)	.72
English Lit. and Composition	21,227	E+R	46.2 (10.8)	.69	49.6 (11.1)	.73
		ELA	21.6 (4.7)	.69	23.1 (4.8)	.72
European History	1,025	E+R	49.8 (11.1)	.67	52.9 (10.7)	.66
		ELA	23.2 (4.8)	.66	24.5 (4.6)	.66
Human Geography	3,245	E+R	46.2 (10.3)	.56	46.8 (10.3)	.57
		ELA	21.5 (4.6)	.56	21.8 (4.6)	.56
Psychology	6,813	E+R	46.4 (10.6)	.65	49.0 (10.7)	.65
		ELA	21.7 (4.6)	.63	22.8 (4.7)	.64
US Govt and Politics	5,050	E+R	48.7 (10.7)	.61	50.8 (10.6)	.60
		ELA	22.7 (4.6)	.60	23.6 (4.6)	.60
US History	15,669	E+R	44.4 (10.3)	.59	48.5 (10.5)	.61
		ELA	20.7 (4.4)	.59	22.5 (4.5)	.61
World History	8,675	E+R	43.0 (10.1)	.62	46.1 (10.4)	.62
		ELA	20.1 (4.3)	.61	21.4 (4.4)	.62
STEM-related						
Biology	8,478	STEM	22.5 (4.0)	.68	24.4 (4.3)	.73
Calculus AB	3,983	STEM	25.0 (3.7)	.57	26.0 (3.8)	.61
Chemistry	5,157	STEM	24.2 (4.1)	.59	26.4 (4.2)	.66
Computer Science A	1,091	STEM	24.4 (4.9)	.63	27.0 (4.8)	.67
Environmental Science	3,643	STEM	22.1 (4.3)	.69	23.5 (4.5)	.71
Macroeconomics	978	STEM	25.8 (4.5)	.56	26.6 (4.5)	.60
Microeconomics	911	STEM	26.7 (4.2)	.59	27.7 (4.2)	.61
Physics 1	3,628	STEM	24.0 (4.1)	.62	25.5 (4.4)	.69
Physics C: E and M	100	STEM	30.0 (3.8)	.60	30.7 (3.7)	.62
Physics C: Mech	413	STEM	28.3 (4.0)	.61	29.3 (3.9)	.59
Statistics	6,002	STEM	23.7 (4.2)	.68	25.6 (4.4)	.72
Other						
Art History	734	Comp.	24.6 (4.7)	.47	25.6 (4.6)	.50
Music Theory	1,078	Comp.	23.8 (4.5)	.53	25.2 (4.7)	.56

Note. E+R = English + Reading. Comp = Composite. Weights were defined as the percentage of students in the referent population achieving a specific AP exam score in the course divided by the corresponding percentage of students in the study sample achieving the specific AP score.

The weighted correlations were generally similar to those reported for PSAT/SAT scores (College Board, 2020c); the correlations for PSAT/SAT scores were generally reported in relation to the Total (Evidence-based Reading and Writing + Math) score. In this study, we typically found that the correlations were the highest for the aggregate content-relevant scores (e.g., ELA or STEM), a finding consistent with that found in our earlier study based on ACT Plan scores (ACT, 2009).

Table A4 in the Appendix provides the weighted correlations and corresponding 95% confidence intervals overall and by ACT test source (PreACT/ACT vs. ACT Aspire). The correlations are generally comparable between the two test sources. All correlations are greater than .50 and suggest that students' achievement levels from the prior academic year as measured by PreACT, ACT, or ACT Aspire test scores are positively related to how students perform on their subsequent AP exams.

Cut Scores Expressed on the PreACT/ACT Score Scale

In this section, we provide the cut scores expressed on the PreACT/ACT scale. We note that students' ACT Aspire scores were converted to PreACT/ACT scores (using Table 4 from Allen & Tao, 2020) and combined with actual PreACT/ACT scores in the analyses. In the next section, we provide the cut scores expressed on the ACT Aspire scale based on using the derived PreACT/ACT cut scores provided in this section and the concordance between PreACT/ACT and ACT Aspire scores (see Table 3 from Allen & Tao, 2020).

The PreACT/ACT cut scores associated with approximately a 50% chance of earning a 3 or higher and a 4 or higher on the specific AP exam are provided in Table 4. The parameter estimates and corresponding standard errors from the weighted logistic regression models from which the cut scores on the PreACT/ACT scale were derived are shown in Table A5 in the Appendix. For each course and outcome, two cut scores are provided—one for fall and one for spring testing depending on when students take the ACT assessment. For example, the first row of results within the table indicate that students who tested in the fall of grade 10 or 11 and achieved a PreACT or ACT E+R score of 42 or higher are likely academically ready to excel in AP English Language and Composition in the subsequent year as they have a reasonable chance of earning a 3 or higher on the corresponding AP exam. Those with a PreACT or ACT E+R score of 54 or higher have a reasonable chance of earning a 4 or higher score on the AP exam. The AP-ready cut scores derived from spring testing in grade 10 are slightly higher at 45 for the 3 or higher outcome and 56 for the 4 or higher outcome to account for the reduced time between PreACT or ACT testing and beginning the AP course and taking the AP exam.

Table 4. PreACT/ACT Scores Associated with Approximately a 50% Chance of Success on AP Exams

AP Course	N	PreACT/ ACT score	3 or Higher		4 or Higher	
			Fall	Spring	Fall	Spring
ELA-related						
English Lang. and Composition.	22,044	E+R	42	45	54	56
		ELA	20	21	25	26
English Lit. and Composition	21,227	E+R	49	51	61	62
		ELA	23	24	28	28
European History	1,025	E+R	45	49	57	60
		ELA	21	23	26	28
Human Geography	3,245	E+R	41	41	52	52
		ELA	19	19	24	24
Psychology	6,813	E+R	39	42	46	49
		ELA	19	20	22	23
US Govt and Politics	5,050	E+R	47	50	59	61
		ELA	22	23	27	28
US History	15,669	E+R	44	47	55	57
		ELA	21	22	25	26
World History	8,675	E+R	39	43	51	55
		ELA	19	20	24	25
STEM-related						
Biology	8,478	STEM	22	23	26	27
Calculus AB*	3,983	STEM	25	25	28	28
Chemistry	5,157	STEM	24	25	28	29
Computer Science A	1,091	STEM	24	24	28	28
Environmental Science	3,643	STEM	23	24	25	26
Macroeconomics	978	STEM	24	26	27	28
Microeconomics	911	STEM	23	25	25	28
Physics 1**	3,628	STEM	27	27	30	30
Physics C: E and M	100	STEM	26	28	28	30
Physics C: Mech	413	STEM	25	25	28	28
Statistics	6,002	STEM	23	24	27	28
Other						
Art History	734	Comp.	22	22	28	28
Music Theory	1,078	Comp.	21	22	25	27
PSAT/SAT-derived						
Comparative Govt. and Politics	--	Comp.	22	22	25	25
Computer Science Principles	--	Comp.	18	18	25	25

Note. E+R = English + Reading score. Comp. = Composite score. Students' ACT Aspire scores were converted to PreACT/ACT scores (using Table 4 from Allen & Tao, 2020) and combined with actual PreACT/ ACT scores in the analyses.

*Cut scores are not reported for AP Calculus BC. As recommended by College Board as part of AP Potential, students who meet the AP Calculus AB cut scores and perform well in courses leading up to Calculus may consider taking AP Calculus BC (College Board, 2020b).

**Cut scores are not reported for AP Physics 2. As recommended by College Board as part of AP Potential, students who meet the AP Physics 1 cut scores and perform well in prerequisite courses for AP Physics 2 may consider taking AP Physics 2 (College Board, 2020b).

The probability distributions as a function of PreACT/ACT scores are shown in Tables A7 to A17 in the Appendix (see Tables A7 to A9 for ELA-related AP courses based on E+R score; Tables A10 to A12 for ELA-related AP courses based on ELA score; Tables A13 to A16 for STEM-related AP courses based on STEM score; Table A17 for AP Art History and AP Music Theory based on Composite score). As a students' PreACT/ACT score increases, their chances of success on the AP exam also increases. According to the probability distributions, it was generally the case that the recommended cut score associated with a 50% chance of earning a 4 or higher on the AP exam corresponded to nearly a 70% or greater chance of earning a 3 or higher on the AP exam.[3]

In supplemental analyses, we compared the reported PSAT/SAT scores associated with a 50% chance of success on the AP exams (College Board, 2020b) to the empirically derived Pre-ACT/ACT cut scores using the SAT-ACT Concordance (College Board & ACT, 2018). These analyses were conducted to validate the cut scores and the techniques employed in this study. Results from these analyses suggested general agreement between the cut scores. For all but four of the AP courses, the PSAT/SAT score linked to AP exam success was the Total score, which was concorded to the PreACT/ACT Composite score. The cut scores based on the Total/Composite scores were found to be within one point of each other for most of the cases (data not shown; 76.5% of cases for 3 or higher outcome and 82.4% of cases for 4 or higher outcome). One of the larger differences was for the AP English Language and Composition course where the empirically derived fall PreACT/ACT E+R cut scores shown in Table 4 were 2 to 3 points higher than those based on the concorded PSAT/SAT Evidence-based Reading and Writing (ERW) scores. We note, however, that the empirically derived PreACT/ACT E+R cut scores were in alignment with those previously reported based on ACT Plan scores for many of the courses, including the AP English Language and Composition course (ACT, 2009). In cases where the PreACT/ACT cut scores differed considerably from the previously reported ACT Plan cut scores (e.g., AP English Literature and Composition), the updated PreACT/ACT cut scores were well aligned with the PSAT/SAT cut scores and therefore appear to be reflective of the current level of achievement needed to succeed in the specific AP course. Given that the empirically derived PreACT/ACT cut scores were found to be similar to those reported for the PSAT/SAT test, we provide concorded PreACT/ACT cut scores in Table 4 for AP Comparative Government and Politics and AP Computer Science Principles—the two courses in the current study with insufficient data for analyses for which the College Board provides cut scores (see last two rows of results in Table 4). Given that the linkages between PSAT/SAT scores and AP exam success are not reported separately for fall and spring testing, we set the recommended fall and spring PreACT/ACT cut scores to the same value.

As shown in Table 5, the two measures of model fit—pseudo-R^2 values and classification accuracy rates—were relatively high and complemented the findings from the comparisons to PSAT/SAT cut scores, providing further empirical evidence supporting the validity of the ACT tests for identifying students who are ready to excel in AP courses. More specifically, for the 3 or higher AP outcome, the pseudo-R^2 values ranged from .36 (AP Human Geography) to .56 (AP English Literature and Composition) for the ELA-related AP courses and from .36 (Calculus AB) to .54 (Biology) for the STEM-related AP courses. For AP Art History and AP Music Theory,

the pseudo-R^2 values were slightly lower at 0.27 and 0.30, respectively. It is important to keep in mind that pseudo-R^2 values for binary outcomes are typically smaller in magnitude than R^2 values for continuous outcomes. These pseudo-R^2 values are in alignment with those reported in a similar study by College Board supporting AP potential (Zhang, Patel, & Ewing, 2014a).

The classification accuracy rates ranged from 72.6% (AP Art History) to 83.4% (AP Physics C: Mechanics) for the 3 or higher outcome and 72.3% (AP Physics C: Mechanics) to 85.3% (AP English Literature and Composition) for the 4 or higher outcome. As an example, to help further interpret the accuracy rates, the model based on E+R score for the AP English Language and Composition exam correctly classified whether a student would achieve a 3 or higher on the AP exam and a 4 or higher for 78.7% and 81.8% of the cases, respectively. These values, when examined in relation to the observed AP success rates (from Table 2), represent a 38% and 189% increase over chance alone in helping to identify students who are likely AP-ready, respectively.[4]

Table 5. Summary Statistics Assessing Model Fit (Pseudo-R2 and Classification Accuracy Rates) by AP Course

AP course	Overall	Score	3 or Higher		4 or Higher	
			Pseudo R^2	Accuracy rate	Pseudo R^2	Accuracy rate
ELA-related						
English Lang. and Composition	22,044	E+R	0.50	78.7	0.48	81.8
		ELA	0.51	79.2	0.48	81.7
English Lit. and Composition	21,227	E+R	0.56	80.1	0.49	85.3
		ELA	0.55	79.8	0.49	85.3
European History	1,025	E+R	0.43	76.2	0.41	76.8
		ELA	0.43	75.6	0.41	77.7
Human Geography	3,245	E+R	0.36	73.5	0.34	75.7
		ELA	0.36	73.0	0.34	75.6
Psychology	6,813	E+R	0.44	78.4	0.43	75.5
		ELA	0.43	77.9	0.41	75.2
US Govt and Politics	5,050	E+R	0.37	73.5	0.34	78.5
		ELA	0.37	73.6	0.34	78.4
US History	15,669	E+R	0.38	73.6	0.31	76.6
		ELA	0.39	73.6	0.32	76.3
World History	8,675	E+R	0.39	74.7	0.33	76.7
		ELA	0.39	74.7	0.33	76.5
STEM-related						
Biology	8,478	STEM	0.54	80.7	0.53	82.5
Calculus AB	3,983	STEM	0.36	73.6	0.38	75.4
Chemistry	5,157	STEM	0.50	78.1	0.45	79.3
Computer Science A	1,091	STEM	0.44	79.1	0.44	74.6
Environmental Science	3,643	STEM	0.50	77.9	0.50	81.2
Macroeconomics	978	STEM	0.40	75.4	0.41	74.4
Microeconomics	911	STEM	0.42	79.8	0.41	74.7
Physics 1	3,628	STEM	0.50	79.3	0.44	83.1
Physics C: E and M	100	STEM	0.37	77.3	0.46	74.5
Physics C: Mechanics	413	STEM	0.45	83.4	0.30	72.3
Statistics	6,002	STEM	0.53	80.1	0.51	79.6
Other						
Art History	734	Comp.	0.27	72.6	0.27	73.0
Music Theory	1,078	Comp.	0.30	74.2	0.35	72.6

Note. E+R = English + Reading score. Comp. = Composite score.

Given that the course samples were comprised of PreACT/ACT test-takers and ACT Aspire test-takers, we examined the classification accuracies and average residuals by test source (see Table A6 in the Appendix). Those results along with those based on the comparisons of the correlation coefficients by test source (see Table A4 in the Appendix) suggest that the two ACT test data sources could be combined as the

results did not meaningful differ by test source. First, the classification accuracy rates tended to be somewhat comparable between the two test source samples – typically only differing by 2 to 3 percentage points. Moreover, larger differences were generally associated with AP courses that had a smaller number of ACT Aspire test-takers, which could be contributing to the larger differences.

Second, the average residuals were generally small and close to zero for both test source samples. Given that the outcome was dichotomous, the average residual was an estimate of the difference between the proportion of students achieving AP exam success and the proportion expected to succeed. For the PreACT/ACT sample, the average residual was at most 1.5 percentage points, which suggests that the model was tending to underpredict the percentage of students to be successful by at most 1.5 percentage points. In most cases, it was much smaller than this. For the ACT Aspire sample, the average residuals were slightly greater in magnitude than those for the PreACT/ACT sample. However, for most of the AP courses, the average residual for the ACT Aspire sample was at most 3 percentage points in magnitude, suggesting that the model was tending to over- or underpredict the percentage of students to be successful by at most 3 percentage points. The cases where the average residual was larger than this included: AP European History (for both outcome levels and for both ELA and E+R score; 0.058 to 0.067), AP United States Government and Politics (for 3 or higher outcome based on E+R score; -0.037), AP Physics C: Mechanics (for 4 or higher outcome; 0.038), and AP Art History (for 3 or higher outcome; 0.051). The sample size of ACT Aspire test-takers was smaller than 50 for AP European History and AP Physics C: Mechanics, which could be contributing to why the residuals based on the ACT Aspire sample seemed somewhat elevated compared to those for the PreACT/ACT sample for these two courses. For the other two courses, despite the slightly elevated residuals for the ACT Aspire sample, the classification accuracy rates were similar between the two samples (Table A6; differed by only 3 percentage points) and the 95% confidence intervals for the correlation coefficients overlapped (Table A4) between the two samples. Taken together, the results suggested that it was reasonable to combine the two data sources for analyses not only for these two courses, but for all courses examined; that is, there was not strong evidence to suggest that the cut scores should be further adjusted to account for the different data sources.

Cut Scores Expressed on the ACT Aspire Scale

Based on the derived PreACT/ACT cut scores provided in Table 4, the corresponding ACT Aspire cut scores are provided in Table 6, using the concordance between PreACT/ACT and ACT Aspire scores (see Table 3 from Allen & Tao, 2020). As an example, the first row of results in Table 6 indicate that students who tested in the fall of grade 9 or 10 and achieved an ACT Aspire E+R score of 867 or higher are likely academically ready to excel in AP English Language and Composition in the subsequent year as they have a reasonable chance of earning a 3 or higher on the corresponding AP exam. Those with an ACT Aspire E+R score of 879 or higher have a reasonable chance of earning a 4 or higher score on the AP exam. The AP-ready ACT Aspire cut scores derived from spring testing in grade 9 or 10 are slightly higher at 870 for the 3 or higher outcome and 881 for the 4 or higher outcome to account for the reduced time between taking ACT Aspire and taking the AP exam. The cut scores

provided in Table 6 should be used instead of those provided in our earlier preliminary linkage that was based on older data from the 2009 ACT Plan-AP study (Radunzel et al., 2015). Along with the corresponding PreACT/ACT scores, the probability distributions as a function of ACT Aspire scores are shown in Tables A7 to A17 in the Appendix.

Table 6. ACT Aspire Cut Scores Associated with Approximately 50% Chance of Success on AP Exams

			3 or Higher		4 or Higher	
AP Course	**N**	**ACT Aspire score**	**Fall**	**Spring**	**Fall**	**Spring**
ELA-related						
English Lang. and Composition	22,044	E+R	867	870	879	881
		ELA	433	434	438	438
English Lit. and Composition	21,227	E+R	875	877	884	884
		ELA	436	437	440	440
European History	1,025	E+R	871	875	881	883
		ELA	434	436	438	440
Human Geography	3,245	E+R	865	865	878	878
		ELA	432	432	437	437
Psychology	6,813	E+R	862	867	872	875
		ELA	432	433	435	436
US Govt and Politics	5,050	E+R	873	876	882	884
		ELA	435	436	439	440
US History	15,669	E+R	869	873	880	881
		ELA	434	435	438	438
World History	8,675	E+R	862	868	877	880
		ELA	432	433	437	438
STEM-related						
Biology	8,478	STEM	435	436	440	442
Calculus AB*	3,983	STEM	439	439	442	442
Chemistry	5,157	STEM	438	439	442	443
Computer Science A	1,091	STEM	438	438	442	442
Environmental Science	3,643	STEM	436	438	439	440
Macroeconomics	978	STEM	438	440	442	442
Microeconomics	911	STEM	436	439	439	442
Physics 1**	3,628	STEM	442	442	444	444
Physics C: E and M	100	STEM	440	442	442	444
Physics C: Mechanics	413	STEM	439	439	442	442
Statistics	6,002	STEM	436	438	442	442
Other						
Art History	734	Comp.	435	435	441	441
Music Theory	1,078	Comp.	433	435	438	440

Table 6. ACT Aspire Cut Scores Associated with Approximately 50% Chance of Success on AP Exams—continued

AP Course	N	ACT Aspire score	3 or Higher		4 or Higher	
			Fall	Spring	Fall	Spring
PSAT/SAT-derived						
Comparative Govt. and Politics	--	Comp.	435	435	438	438
Computer Science Principles	--	Comp.	428	428	438	438

Note. E+R = English + Reading score. Comp. = Composite score. ACT Aspire cut scores were based on the derived PreACT/ACT cut scores provided in Table 4 using the concordance between PreACT/ACT and ACT Aspire scores (see Table 3 from Allen & Tao, 2020).
*Cut scores are not reported for AP Calculus BC. As recommended by College Board as part of AP Potential, students who meet the AP Calculus AB cut scores and perform well in courses leading up to Calculus may consider taking AP Calculus BC (College Board, 2020b).
**Cut scores are not reported for AP Physics 2. As recommended by College Board as part of AP Potential, students who meet the AP Physics 1 cut scores and perform well in prerequisite courses for AP Physics 2 may consider taking AP Physics 2 (College Board, 2020b).

Discussion

ACT Aspire, PreACT, and ACT cut scores corresponding to approximately a 50% chance of earning a 3 or higher AP score can be used as a valid indicator for identifying students who would likely succeed on an AP exam. Students with ACT Aspire, PreACT, or ACT scores at or above the score corresponding to approximately a 50% chance of earning a 3 or higher on the AP exam are likely to become "qualified" to receive college credit in the course. Students with scores at or above the score corresponding to approximately a 50% chance of earning a 4 or higher on the AP exam are likely to become "very well qualified" to receive college credit in the course. For most AP courses, this score also corresponds with greater than a 70% chance of earning a 3 or higher AP score.

While this study focused on relating ACT Aspire, PreACT, and ACT test scores to success on an AP exam, multiple measures should be used to identify students who are likely ready for rigorous high school courses (Camara, O'Connor, Mattern, & Hanson, 2015). Besides standardized test scores, other measures of readiness for AP coursework that might be considered include high school grades, high school rank, prior high school courses taken, and letters of recommendation. Nonacademic factors such as motivation, interest in the content area, and social support possibly also contribute to the likelihood of succeeding in rigorous high school courses, like AP courses. Future studies could explore multiple-predictor models that include these other factors (e.g., a measure of academic discipline) with test scores.

In conclusion, this study found that ACT Aspire, PreACT, and ACT test scores are positively related to AP exam scores and are good predictors of success in AP courses, as measured by receiving a score of 3 or higher and 4 or higher on the corresponding AP exam. The maximum correlation generally occurred when there was strong content

alignment, such as the E+R or ELA score for ELA-related AP courses and the STEM score for STEM-related courses; all correlations with these scores were .50 or higher. As a result, the recommended linkages to AP exam success were developed in relation to content-relevant scores for most courses. Moreover, the measures of model fit—pseudo-R^2 values and classification accuracy rates—were relatively high and provided additional support that ACT Aspire, PreACT, and ACT test scores are useful for helping to identify students who are likely academically ready to excel in an AP course and perform well on the exam.

The recommended cut scores derived in this study could be used by schools and educators to:

- Determine which of their students are likely to excel in rigorous courses in high school, such as AP courses.
- Provide students and their parents with information regarding their likelihood of success on an AP exam.
- Forecast the number of students who are likely to pass an AP exam at a "qualified" or "very well qualified" level.

Study Limitations

One limitation of the study is that most of the data came from a single state. To develop linkages that would be representative of those that might be seen in the national AP test-taking population, we employed weights so that the AP exam score distribution of the sample resembled that seen among the national AP referent population. We also statistically controlled for other variables in the regression models (i.e., the grade level when the AP exam was taken) to account for additional observed differences between the sample and population that appeared to affect the cut scores. Cut scores and probabilities were then derived by taking the weighted average of the cut scores and probabilities per grade level according to the grade-level distribution of the AP referent population.

Another limitation is that the sample sizes for some of the courses were relatively small (e.g., 100 for Physics C: Electricity and Magnetism and 413 for Physics C: Mechanics). In supplemental analyses, we found that the empirically-derived fall cut scores (generally based on the Composite score,[5] expressed on the PreACT/ACT scale) were similar (generally within 1 score point) to the PSAT/SAT Total cut scores reported as part of AP Potential (College Board, 2020b), after putting the PSAT/SAT scores on the ACT scale based on the ACT-SAT concordance (College Board & ACT, 2018). This result was found to be the case even for the AP course with the smallest sample size of 100 students (AP Physics C: Electricity and Magnetism). The supplemental analysis suggests that the study's results are reliable, despite the heavy reliance on data from one state and, in some cases, small sample sizes.

To maximize the sample sizes for course-specific analyses, we combined ACT Aspire, PreACT, and ACT test scores using concordance tables between the assessments

(Allen & Tao, 2020). Therefore, another limitation is that the study possibly masks differences across assessments in their relationships with AP exam success. Correlations, classification accuracy rates, and average residuals were examined by test source (PreACT/ACT vs. ACT Aspire), and the results did not indicate that there were issues with combining data across assessments to develop the AP linkages; the correlations and classification accuracies were relatively similar between ACT Aspire scores and PreACT/ACT scores, suggesting that both measures are good predictors of success on AP exams.

Another limitation of the study is that two AP courses have been recently redesigned, but their linkages presented in this study are based on data from earlier years prior to the course redesigns. The courses include AP United States Government and Politics, which was redesigned in 2018-2019, and AP World History, which was redesigned to AP World History Modern in 2019-2020. The linkages for these courses will be reevaluated once data becomes available to conduct such analyses. ACT stands ready to collaborate with states and districts that administer the ACT Aspire, PreACT, and/or ACT tests to further examine the relationships between these test scores and likely success in rigorous high school courses, including AP courses.

Notes

1. The ACT ELA score was introduced in fall 2015. Additionally, the optional ACT writing test was enhanced at this same time. For students who took the former ACT writing test, ACT ELA scores were estimated by using a concordance table between the former and enhanced writing scores (ACT, 2015a). The typical percentage of ELA scores that were estimated per course via the ACT E+R and ACT ELA concordance was 57.9% for the ELA-related AP courses (ranged from 18.6% (AP World History) to 78.9% (AP English Literature and Composition)).
2. These 11 courses included: AP European History, AP Human Geography, AP Psychology, AP Chemistry, AP Computer Science A, AP Environmental Science, AP Microeconomics, AP Physics 1, AP Physics C: Mechanics, AP Art History, and AP Music Theory.
3. The only scenario where this conclusion did not hold was for the fall cut score for AP Physics C: Electricity and Mechanics; students' chances of earning a 3 or higher in this case was 62%. A possible explanation for the lower probability than seen for the other AP courses could be due to the smaller sample size for this course (100 students).
4. The percentage increase in the accuracy rate over chance alone can be determined by subtracting the success rate from the classification accuracy rate and dividing by the success rate.
5. Note that the empirically derived Composite score results from the supplemental analyses are not provided in this report for most courses because we recommend using the content-relevant aggregated scores (e.g., E+R, ELA, or STEM) instead of the Composite score; a recommendation supported by the study findings.

References

ACT. (2009). *Using PLAN to identify student readiness for rigorous courses in high school*. Iowa City, IA: ACT.

ACT. (2015a). *Linking the current and former ACT writing tests*. Iowa City, IA: ACT.

ACT. (2015b). *Using dual enrollment to improve the educational outcomes of high school students*. Iowa City, IA: ACT.

ACT. (2016). *ACT National Curriculum Survey*. Iowa City, IA: ACT. Retrieved from https://www.act.org/content/dam/act/unsecured/documents/NCS_Report_Web.pdf

ACT. (2018). *The ACT profile report - national*. *Graduating class of 2018*. Iowa City, IA: ACT.

ACT. (2019a). *ACT Aspire Summative technical manual* (2019 version 6). Iowa City, IA: ACT.

ACT. (2019b). *The ACT technical manual* (fall 2019 version 3). Iowa City, IA: ACT.

ACT. (2019c). *The PreACT technical manual* (fall 2019 version 1). Iowa City, IA: ACT.

Allen, J., & Tao, W. (2020). *Concordance of ACT Aspire and PreACT/ACT test scores*. Iowa City, IA: ACT.

Camara, W. J., & Allen, J. (2017). *Does testing date impact student scores on the ACT?* Iowa City, IA: ACT.

Camara, W., O'Connor, R., Mattern, K., & Hanson, M. (2015). *Beyond Academics: A holistic framework for enhancing education and workplace success*. Iowa City, IA: ACT.

College Board (2018a). *Program summary report*. Retrieved from https://secure-media.collegeboard.org/digitalServices/pdf/research/2018/Program-Summary-Report-2018.pdf.

College Board (2018b). *Student score distributions. AP exams – May 2018*. Retrieved from https://secure-media.collegeboard.org/digitalServices/pdf/research/2018/Student-Score-Distributions-2018.pdf.

College Board (2020a). *AP course and exam redesign*. Retrieved from https://aphighered.collegeboard.org/courses-exams/course-exam-redesign.

College Board (2020b). *AP potential. Expectancy tables*. Retrieved from https://cb.collegeboard.org/ap-potential/app/expectancy.html.

College Board (2020c). *AP potential. Score correlations*. Retrieved from https://cb.collegeboard.org/ap-potential/app/score.html.

College Board, & ACT. (2018). *Guide to the 2018 ACT®/SAT®* concordance. Iowa City, IA: ACT.

Radunzel, J., Mattern, K., & Allen, J. (2015). *ACT Aspire® scores associated with AP exam success: A preliminary linkage*. Iowa City, IA: ACT.

Warne, R. T., Larsen, R., Anderson, B., & Odasso, A. J. (2015). The impact of participation in the advanced placement program on students' college admissions test scores. *The Journal of Educational Research, 108*(5), 400–416.

Zhang, X., Patel, P., & Ewing, M. (2014a). *AP® Potential predicted by PSAT/NMSQT® scores using logistic regression*. New York, NY: The College Board.

Zhang, X., Patel, P., & Ewing, M. (2014b). *Incorporating ninth-grade PSAT/NMSQT® scores into AP Potential™ predictions for AP® European History and AP World History*. New York, NY: The College Board.

Appendix

Table A1. Sample Description of AP ELA-Related Exam Samples after Weighting Applied

Characteristic	English Lang. and Comp.	English Lit. and Comp.	European History	Human Geography	Psychology	US Govt and Politics	US History	World History
Sample size	22,044	21,227	1,025	3,245	6,813	5,050	15,669	8,675
Grade level								
9th grade or earlier	0.0	0.0	0.1	28.8	0.6	1.0	0.1	0.6
10th grade	0.1	0.2	1.7	10.9	6.8	3.3	6.7	77.9
11th grade	83.9	15.0	10.9	12.9	27.3	23.4	82.9	9.7
12th grade	13.3	82.8	84.9	44.9	63.6	70.9	7.3	9.4
Unknown	2.7	2.0	2.3	2.5	1.8	1.5	3.0	2.4
Gender								
Male	36.4	35.7	52.0	44.1	33.9	46.3	44.6	44.0
Female	63.6	64.2	47.9	55.9	66.1	53.8	55.4	56.0
Unknown	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Race/ethnicity								
African American	9.1	11.1	6.3	8.0	8.5	6.8	9.7	9.3
American Indian	0.6	0.7	0.2	0.9	0.7	0.7	0.5	0.4
Asian American	4.0	3.8	6.4	7.0	7.2	5.6	4.5	5.3
Hispanic	6.8	7.5	7.9	11.7	11.5	7.9	6.5	10.7
Pac. Islander/ Native Hawaiian	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.3
White	77.3	74.7	77.4	70.2	69.4	76.4	76.3	71.8
Multiracial	2.2	2.1	1.7	1.9	2.6	2.6	2.3	2.3
Unknown	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Economically disadvantaged								
Yes	25.2	29.0	21.0	20.4	21.7	19.7	24.1	27.4
No	74.8	70.9	78.9	79.5	78.3	80.3	75.8	72.6
Unknown	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
ACT test source								
PreACT/ACT	64.2	92.4	95.1	56.7	80.1	85.9	58.3	22.5
ACT Aspire	35.8	7.6	4.9	43.3	19.9	14.2	41.8	77.5
Year of AP exam								
2014-15	11.2	19.2	0.0	11.1	13.7	14.5	9.5	0.0
2015-16	21.3	26.1	36.1	21.7	23.7	22.3	21.8	0.0
2016-17	34.4	28.9	30.5	32.1	31.9	33.2	35.5	49.7
2017-18	33.1	25.3	33.4	35.1	30.6	30.0	32.9	50.3
2018-19	0.0	0.5	0.0	0.0	0.1	0.0	0.2	0.0
Number of months between ACT and AP testing								
Average	13.0	14.1	15.8	13.3	14.0	14.3	13.0	13.1
SD	3.3	4.1	2.9	3.3	3.7	3.9	3.2	1.8

Note. SD = standard deviation. Economically disadvantaged was defined by meeting one of the following criteria: eligible for free or reduced lunch or self-reporting an annual family income of less than $36,000.

Table A2. Sample Description of AP STEM-Related Exam Samples after Weighting Applied

Characteristic	Biology	Calculus AB	Chemistry	Com. Sci. A	Environ. Science	Macro-economics	Micro-economics	Physics 1
Sample size	8,478	3,983	5,157	1,091	3,643	978	911	3,628
Grade level								
9th grade or earlier	0.0	0.2	0.3	0.4	0.3	0.0	0.0	1.2
10th grade	13.9	1.2	2.6	11.4	2.9	1.7	1.7	9.9
11th grade	34.6	23.3	41.6	27.6	23.1	25.0	13.2	46.6
12th grade	49.6	73.9	54.1	59.1	72.2	72.0	83.5	40.4
Unknown	1.9	1.3	1.4	1.6	1.5	1.3	1.5	2.0
Gender								
Male	41.1	52.7	51.8	80.5	46.9	57.6	59.9	64.1
Female	58.8	47.3	48.2	19.5	53.1	42.4	40.1	35.9
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Race/ethnicity								
African American	7.1	7.0	5.5	5.1	10.5	4.1	4.1	7.2
American Indian	0.5	0.6	0.8	0.7	0.7	0.9	0.9	0.5
Asian American	7.3	8.2	10.7	13.8	6.8	16.1	17.4	8.4
Hispanic	6.4	6.4	6.1	9.3	7.8	6.8	5.5	7.5
Pac. Islander/ Native Hawaiian	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1
White	76.5	75.2	74.9	68.0	72.4	70.5	70.1	74.0
Multiracial	2.1	2.5	2.0	3.0	1.7	1.6	2.0	2.4
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Economically disadvantaged								
Yes	25.2	29.0	21.0	20.4	21.7	19.7	24.1	27.4
No	74.8	70.9	78.9	79.5	78.3	80.3	75.8	72.6
Unknown	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
ACT test source								
PreACT/ACT	77.0	87.5	84.0	76.7	84.2	88.6	95.8	70.2
ACT Aspire	23.0	12.5	16.0	23.3	15.8	11.4	4.2	29.8
Year of AP exam								
2014-15	13.8	0.0	16.3	10.0	13.0	14.5	13.2	0.0
2015-16	22.2	0.0	26.3	15.4	23.0	21.7	20.5	26.9
2016-17	33.8	52.4	25.9	33.8	31.2	34.5	39.5	37.5
2017-18	30.0	47.5	31.5	40.8	32.8	29.3	26.8	35.7
2018-19	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Number of months between ACT and AP testing								
Average	13.8	16.2	14.0	14.0	14.4	14.8	14.9	14.6
SD	3.8	2.6	4.0	3.5	3.8	3.9	3.8	2.9

Note. SD = standard deviation. Economically disadvantaged was defined by meeting one of the following criteria: eligible for free or reduced lunch or self-reporting an annual family income of less than $36,000. Results for other STEM-related AP courses shown in Table A3.

Table A3. Sample Description of Additional STEM-Related and Other AP Exam Samples after Weighting Applied

Characteristic	Physics C: E and M	Physics C: Mech.	Stats	Art History	Music Theory
Sample size	100	413	6,002	734	1,078
Grade level					
9th grade or earlier	0.0	0.0	0.1	0.2	0.0
10th grade	0.0	0.9	1.4	9.0	2.9
11th grade	8.2	31.0	22.3	26.8	20.0
12th grade	77.8	63.8	74.8	61.1	74.4
Unknown	14.0	4.2	1.4	2.9	2.7
Gender					
Male	74.2	75.4	46.2	36.9	56.3
Female	15.1	21.7	53.8	63.1	43.6
Unknown	10.6	2.9	0.0	0.0	0.1
Race/ethnicity					
African American	0.0	1.2	7.1	3.6	4.8
American Indian	0.0	0.1	0.5	1.0	0.5
Asian American	19.3	16.0	9.1	8.1	5.4
Hispanic	7.1	7.7	7.9	7.5	6.3
Pac. Islander/ Native Hawaiian	0.0	0.1	0.1	0.0	0.0
White	62.1	68.7	73.2	77.7	81.2
Multiracial	0.8	3.3	2.1	2.1	1.8
Unknown	10.6	2.9	0.0	0.0	0.1
Economically disadvantaged					
Yes	12.5	8.1	20.7	13.6	21.1
No	76.2	88.8	79.3	86.4	78.8
Unknown	11.3	3.2	0.0	0.0	0.1
ACT test source					
PreACT/ACT	77.0	87.5	84.0	76.7	84.2
ACT Aspire	23.0	12.5	16.0	23.3	15.8
Year of AP exam					
2014-15	13.6	18.1	16.2	0.0	13.3
2015-16	35.9	19.8	25.1	27.0	25.3
2016-17	34.5	39.6	29.3	38.4	34.4
2017-18	16.0	22.6	29.4	34.6	27.0
2018-19	0.0	0.0	0.0	0.0	0.0
Number of months between ACT and AP testing					
Average	15.5	14.0	14.5	15.4	14.3
SD	4.1	4.0	4.0	2.9	3.8

Note. SD = standard deviation. Economically disadvantaged was defined by meeting one of the following criteria: eligible for free or reduced lunch or self-reporting an annual family income of less than $36,000. Results for other STEM-related AP courses shown in Table A2.

Table A4. Weighted Correlations between ACT Assessment Scores and AP Exam Scores by ACT Test Source

AP course	PreACT/ ACT sample	ACT Aspire sample	Score	Overall	PreACT/ACT sample	ACT Aspire sample
ELA-related						
English Lang. and Comp.	13,250	8,794	E+R	.71 (.71, .72)	.72 (.71, .73)	.69 (.68, .70)
			ELA	.72 (.71, .72)	.72 (.71, .73)	.70 (.69, .71)
English Lit. and Comp.	19,628	1,599	E+R	.73 (.72, .73)	.73 (.73, .74)	.64 (.61, .67)
			ELA	.72 (.72, .73)	.73 (.72, .74)	.63 (.60, .66)
European History	976	49	E+R	.66 (.62, .69)	.66 (.62, .69)	.68 (.49, .80)
			ELA	.66 (.62, .69)	.66 (.62, .69)	.66 (.46, .79)
Human Geography	1,850	1,395	E+R	.57 (.54, .59)	.61 (.58, .64)	.54 (.50, .58)
			ELA	.56 (.53, .58)	.61 (.58, .64)	.54 (.50, .57)
Psychology	5,497	1,316	E+R	.65 (.64, .66)	.67 (.65, .68)	.60 (.57, .64)
			ELA	.64 (.62, .65)	.66 (.65, .68)	.57 (.53, .60)
US Govt and Politics	4,300	750	E+R	.60 (.59, .62)	.61 (.59, .63)	.56 (.51, .61)
			ELA	.60 (.58, .61)	.60 (.58, .62)	.54 (.49, .59)
US History	8,610	7,059	E+R	.61 (.60, .62)	.62 (.60, .63)	.59 (.58, .61)
			ELA	.61 (.60, .62)	.62 (.60, .63)	.59 (.57, .60)
World History	1,666	7,009	E+R	.62 (.61, .64)	.59 (.56, .62)	.62 (.60, .63)
			ELA	.62 (.61, .64)	.59 (.56, .62)	.62 (.60, .63)
STEM-related						
Biology	6,518	1,960	STEM	.73 (.72, .74)	.73 (.72, .74)	.74 (.72, .76)
Calculus AB	3,556	427	STEM	.61 (.59, .62)	.61 (.59, .63)	.58 (.51, .64)
Chemistry	4,517	640	STEM	.66 (.64, .68)	.66 (.64, .67)	.72 (.68, .76)
Computer Science A	811	280	STEM	.67 (.64, .70)	.65 (.61, .69)	.76 (.71, .81)
Environmental Science	3,039	604	STEM	.71 (.70, .73)	.71 (.70, .73)	.71 (.67, .75)
Macroeconomics	858	120	STEM	.60 (.56, .64)	.58 (.53, .62)	.70 (.60, .78)
Microeconomics	873	38	STEM	.61 (.57, .65)	.61 (.57, .65)	.58 (.32, .76)
Physics 1	2,504	1,124	STEM	.69 (.67, .71)	.68 (.66, .70)	.71 (.67, .73)
Physics C: E and M	98	2	STEM	.62 (.48, .73)	.61 (.47, .72)	
Physics C: Mechanics	369	44	STEM	.59 (.52, .65)	.57 (.50, .64)	.68 (.48, .81)
Statistics	5,550	452	STEM	.72 (.71, .73)	.72 (.71, .73)	.73 (.68, .77)
Other						
Art History	581	153	Comp.	.50 (.44, .55)	.49 (.42, .55)	.60 (.49, .69)
Music Theory	926	152	Comp.	.56 (.52, .60)	.55 (.51, .59)	.54 (.41, .64)

Note. E+R = English + Reading score.

Table A5. Parameter Estimates from Weighted Logistic Regression Models

AP course	Score	Outcome	Intercept (SE)	Score slope (SE)	Months slope (SE)	Interaction between score and months (SE)	Grade level indicator (SE)[1]	Interaction between score and grade level indicator (SE)[1]
ELA-related								
English Lang. and Composition	E+R	3 or higher	-10.0401 (0.4850)*	0.1940 (0.0102)*	0.1297 (0.0362)*	-0.0008 (0.0008)	-1.4474 (0.3987)*	0.0270 (0.0082)*
		4 or higher	-12.2029 (0.5629)*	0.1941 (0.0102)*	0.1632 (0.0410)*	-0.0013 (0.0008)	-1.3994 (0.4310)*	0.0249 (0.0077)*
	ELA	3 or higher	-11.8083 (0.5490)*	0.4931 (0.0246)*	0.1804 (0.0406)*	-0.0038 (0.0018)**	-1.7172 (0.4502)*	0.0650 (0.0197)*
		4 or higher	-13.8881 (0.6418)*	0.4884 (0.0254)*	0.1979 (0.0466)*	-0.0041 (0.0019)	-1.7604 (0.4971)*	0.0632 (0.0193)*
English Lit. and Composition	E+R	3 or higher	-10.3078 (0.5200)*	0.1970 (0.0102)*	0.1051 (0.0323)*	-0.0010 (0.0006)**	-1.2173 (0.3314)*	0.0138 (0.0068)*
		4 or higher	-13.0972 (0.7384)*	0.2015 (0.0126)*	0.1703 (0.0462)*	-0.0020 (0.0008)*	-1.9457 (0.4453)*	0.0290 (0.0078)*
	ELA	3 or higher	-11.2627 (0.5822)*	0.4664 (0.0247)*	0.1166 (0.0363)*	-0.0027 (0.0015)**	-1.5431 (0.3685)*	0.0400 (0.0162)*
		4 or higher	-14.2189 (0.8158)*	0.4852 (0.0305)*	0.1788 (0.0508)*	-0.0046 (0.0019)*	-2.1573 (0.4972)*	0.0666 (0.0192)*
European History	E+R	3 or higher	-8.6953 (2.7848)*	0.1499 (0.0531)*	0.2053 (0.1817)	-0.0022 (0.0035)	-2.2150 (1.3449)**	0.0373 (0.0252)
		4 or higher	-15.4766 (3.8662)*	0.2359 (0.0658)*	0.3334 (0.2295)	-0.0039 (0.0039)	0.7861 (1.9678)	-0.0199 (0.0335)
	ELA	3 or higher	-9.3021 (3.1066)*	0.3496 (0.1277)*	0.2275 (0.2036)	-0.0057 (0.0083)	-2.8824 (1.4669)*	0.1056 (0.0597)**
		4 or higher	-16.9394 (4.0994)*	0.5704 (0.1524)*	0.4591 (0.2473)**	-0.0133 (0.0092)	-0.5518 (1.9758)	0.0038 (0.0739)
Human Geography	E+R	3 or higher	-5.5384 (0.4018)*	0.1386 (0.0094)*			-1.1699 (0.5192)*	-0.0004 (0.0115)
		4 or higher	-6.2575 (0.3898)*	0.1235 (0.0083)*			-1.7683 (0.5424)*	0.0189 (0.0109)
	ELA	3 or higher	-5.7247 (0.4099)*	0.3081 (0.0206)*			-1.5438 (0.5458)*	0.0120 (0.0259)
		4 or higher	-6.2753 (0.3957)*	0.2676 (0.0182)*			-2.4914 (0.5786)*	0.0696 (0.0250)*
Psychology	E+R	3 or higher	-7.4719 (0.7533)*	0.1611 (0.0159)*	0.1234 (0.0529)*	-0.0010 (0.0011)	-1.6576 (0.4000)*	0.0190 (0.0087)*
		4 or higher	-8.9037 (0.7530)*	0.1602 (0.0145)*	0.1623 (0.0526)*	-0.0014 (0.0010)	-1.2519 (0.3943)*	0.0107 (0.0079)
	ELA	3 or higher	-7.0706 (0.7945)*	0.3293 (0.0357)*	0.0947 (0.0564)**	-0.0011 (0.0025)	-2.2097 (0.4193)*	0.0631 (0.0195)*
		4 or higher	-8.7087 (0.8101)*	0.3398 (0.0337)*	0.1428 (0.0570)*	-0.0023 (0.0024)	-1.8659 (0.4219)*	0.0469 (0.0182)*
US Govt and Politics	E+R	3 or higher	-7.1102 (0.8230)*	0.1299 (0.0158)*	0.0557 (0.0557)	0.0005 (0.0011)	-0.6524 (0.4682)	-0.0008 (0.0094)
		4 or higher	-9.0291 (1.0559)*	0.1403 (0.0185)*	0.0983 (0.0720)	-0.0005 (0.0012)	-1.4537 (0.5710)*	0.0116 (0.0104)
	ELA	3 or higher	-7.7149 (0.9051)*	0.3064 (0.0375)*	0.0598 (0.0612)	0.0008 (0.0025)	-0.6981 (0.5120)	-0.0016 (0.0221)
		4 or higher	-9.6879 (1.1510)*	0.3316 (0.0439)*	0.0934 (0.0780)	-0.0009 (0.0029)	-1.2771 (0.6307)*	0.0166 (0.0250)

Table A5. Parameter Estimates from Weighted Logistic Regression Models—continued

AP course	Score	Outcome	Intercept (SE)	Score slope (SE)	Months slope (SE)	Interaction between score and months (SE)	Grade level indicator (SE)[1]	Interaction between score and grade level indicator (SE)[1]
US History	E+R	3 or higher	-7.8678 (0.4807)*	0.1443 (0.0096)*	0.0982 (0.0360)*	-0.0004 (0.0007)	-1.3017 (0.4751)*	0.0107 (0.0090)
		4 or higher	-8.6213 (0.5297)*	0.1344 (0.0097)*	0.1111 (0.0390)*	-0.0008 (0.0007)	-1.1563 (0.5428)*	0.0089 (0.0094)
	ELA	3 or higher	-8.5667 (0.5340)*	0.3418 (0.0230)*	0.0994 (0.0399)*	-0.0009 (0.0017)	-1.7697 (0.5480)*	0.0402 (0.0224)**
		4 or higher	-9.7878 (0.5903)*	0.3400 (0.0235)*	0.1393 (0.0434)*	-0.0028 (0.0017)	-1.3313 (0.6141)*	0.0240 (0.0233)
World History	E+R	3 or higher	-9.1317 (1.2609)*	0.1844 (0.0272)*	0.2125 (0.0991)*	-0.0028 (0.0021)	-0.2786 (0.4869)	0.0012 (0.0104)
		4 or higher	-10.2345 (1.2339)*	0.1675 (0.0234)*	0.2414 (0.0964)*	-0.0030 (0.0018)	-0.2543 (0.4952)	-0.0012 (0.0093)
	ELA	3 or higher	-9.9671 (1.3821)*	0.4389 (0.0637)*	0.2330 (0.1085)*	-0.0074 (0.0050)	-0.4297 (0.5391)	0.0095 (0.0246)
		4 or higher	-11.1221 (1.3991)*	0.4083 (0.0577)*	0.2458 (0.1093)*	-0.0071 (0.0045)	0.0224 (0.5599)	-0.0141 (0.0229)
STEM-related								
Biology	STEM	3 or higher	-11.481 (0.9805)*	0.4921 (0.0411)*	-0.0024 (0.0704)	0.0030 (0.0029)	-0.6875 (0.5436)	-0.0210 (0.0232)
		4 or higher	-9.0417 (1.1172)*	0.3002 (0.0417)*	-0.3236 (0.0821)*	0.0153 (0.0031)*	-2.0034 (0.6485)*	0.0354 (0.0243)*
Calculus AB	STEM	3 or higher	-9.7373 (0.7706)*	0.4156 (0.0305)*			0.7752 (0.8623)	-0.0619 (0.0340)**
		4 or higher	-10.731 (0.7240)*	0.4061 (0.0271)*			0.0232 (0.8468)	-0.0313 (0.0316)
Chemistry	STEM	3 or higher	-16.2032 (1.3169)*	0.6196 (0.0496)*	0.2446 (0.0862)*	-0.0067 (0.0032)*	1.6420 (0.7473)*	-0.1147 (0.0288)*
		4 or higher	-17.7469 (1.3832)*	0.5872 (0.0479)*	0.4112 (0.0922)*	-0.0112 (0.0032)*	-1.0202 (0.7283)	-0.0113 (0.0258)
Computer Science A	STEM	3 or higher	-11.2036 (1.1542)*	0.4704 (0.0463)*			4.0861 (1.3484)*	-0.1724 (0.0534)*
		4 or higher	-12.0477 (1.1515)*	0.4430 (0.0425)*			3.3687 (1.3672)*	-0.1352 (0.0499)*
Environmental Science	STEM	3 or higher	-9.7859 (1.3934)*	0.3927 (0.0579)*	0.0322 (0.0966)	0.0006 (0.0040)	-1.6045 (0.7666)*	0.0535 (0.0327)
		4 or higher	-10.2245 (1.5311)*	0.3740 (0.0602)*	-0.0853 (0.1040)	0.0052 (0.0041)	-0.4187 (0.8895)	0.0010 (0.0359)
Macro-economics	STEM	3 or higher	-8.5374 (2.3375)*	0.3050 (0.0886)*	-0.0715 (0.1539)	0.0073 (0.0057)	1.2301 (1.4122)	-0.0898 (0.0564)
		4 or higher	-9.7851 (2.5584)*	0.3249 (0.0925)*	-0.0957 (0.1657)	0.0073 (0.0059)	1.6386 (1.5565)	-0.0993 (0.0587)**
Micro-economics	STEM	3 or higher	-13.8634 (3.3871)*	0.5116 (0.1272)*	0.3506 (0.2070)**	-0.0083 (0.0076)	-1.1906 (2.1767)	-0.0006 (0.0841)
		4 or higher	-14.5822 (3.2312)*	0.4735 (0.1133)*	0.4073 (0.2010)*	-0.0090 (0.0070)	-2.1056 (1.9707)	0.0311 (0.0717)
Physics 1	STEM	3 or higher	-12.6258 (0.5492)*	0.4810 (0.0211)*			0.1863 (0.8567)	-0.0365 (0.0319)
		4 or higher	-13.8774 (0.6442)*	0.4667 (0.0230)*			0.7813 (0.9921)	-0.0450 (0.0346)

Table A5. Parameter Estimates from Weighted Logistic Regression Models—continued

AP course	Score	Outcome	Intercept (SE)	Score slope (SE)	Months slope (SE)	Interaction between score and months (SE)	Grade level indicator (SE)[1]	Interaction between score and grade level indicator (SE)[1]
Physics C: E and M	STEM	3 or higher	-33.0341 (16.1336)*	1.1377 (0.5421)*	1.0862 (0.8661)	-0.0362 (0.0290)	5.9157 (7.5679)	-0.1986 (0.2590)
		4 or higher	-34.4477 (14.4424)*	1.0701 (0.4591)*	0.7761 (0.7418)	-0.0215 (0.0236)	10.3050 (8.5962)	-0.3256 (0.2789)
Physics C: Mechanics	STEM	3 or higher	-11.4158 (5.4632)*	0.4543 (0.2028)*	-0.1942 (0.3197)	0.0098 (0.0117)	3.2586 (3.5625)	-0.1711 (0.1368)
		4 or higher	-6.9210 (3.7326)**	0.2502 (0.1278)*	-0.0737 (0.2447)	0.0031 (0.0084)	-0.7629 (2.0609)	0.0111 (0.0710)
Statistics	STEM	3 or higher	-12.5701 (1.2630)*	0.5084 (0.0507)*	0.0464 (0.0794)	0.0013 (0.0032)	0.1250 (0.7824)	-0.0473 (0.0323)
		4 or higher	-11.3263 (1.2832)*	0.3909 (0.0473)*	-0.0578 (0.0832)	0.0054 (0.0030)	-1.0561 (0.7571)	-0.0018 (0.0288)
Other								
Art History	Comp.	3 or higher	-6.3710 (0.9633)*	0.2960 (0.0411)*			1.2639 (1.1898)	-0.0756 (0.0493)
		4 or higher	-8.6076 (1.1023)*	0.3337 (0.0436)*			2.6711 (1.3349)*	-0.1378 (0.0514)*
Music Theory	Comp.	3 or higher	-6.4486 (1.9993)*	0.2574 (0.0813)*	-0.0787 (0.1325)	0.0056 (0.0054)	2.2224 (1.2065)**	-0.0913 (0.0504)**
		4 or higher	-11.6700 (2.2679)*	0.3971 (0.0858)*	0.1218 (0.1451)	-0.0012 (0.0055)	3.1334 (1.3795)*	-0.1314 (0.0535)*

Note. E+R = English + Reading score. SE = standard error. * $p \leq 0.05$ ** $0.05 < p \leq 0.10$

[1] The dichotomous grade level indicator was coded as one when the AP course was taken in grade 12, and zero otherwise, except for the following courses that tend to be taken predominantly by ninth- and tenth-graders instead of eleventh- and twelfth-graders: European History, Human Geography, and World History. For these latter three courses, the grade level indicator was coded as one when the AP courses was taken in grade 11 or 12, and zero otherwise.

Table A6. Classification Accuracy and Average Residuals by ACT Test Source

AP course	Sample Size: PreACT/ ACT sample	Sample Size: ACT Aspire sample	Score	Outcome	Classification Accuracy: Overall	Classification Accuracy: PreACT/ ACT sample	Classification Accuracy: ACT Aspire sample	Average Residual: PreACT/ ACT sample	Average Residual: ACT Aspire sample
ELA-related									
English Lang. and Composition	13,250	8,794	E+R	3 or higher	78.7	79.8	76.7	0.015	-0.027
				4 or higher	81.8	80.8	83.7	0.009	-0.015
			ELA	3 or higher	79.2	80.1	77.6	0.011	-0.019
				4 or higher	81.7	80.5	84.0	0.003	-0.006
English Lit. and Composition	19,628	1,599	E+R	3 or higher	80.1	80.5	76.3	0.000	0.001
				4 or higher	85.3	85.1	87.2	0.000	-0.002
			ELA	3 or higher	79.8	80.2	74.7	-0.001	0.014
				4 or higher	85.3	85.2	86.1	-0.001	0.010
European History	976	49	E+R	3 or higher	76.2	76.0	80.3	-0.003	0.058
				4 or higher	76.8	76.9	74.5	-0.003	0.067
			ELA	3 or higher	75.6	75.6	75.2	-0.003	0.060
				4 or higher	77.7	77.6	79.5	-0.003	0.067
Human Geography	1,850	1,395	E+R	3 or higher	73.5	74.2	72.6	0.004	-0.005
				4 or higher	75.7	77.0	74.0	0.006	-0.008
			ELA	3 or higher	73.0	73.8	72.0	0.001	-0.001
				4 or higher	75.6	76.5	74.5	0.003	-0.004
Psychology	5,497	1,316	E+R	3 or higher	78.4	78.5	77.8	-0.005	0.018
				4 or higher	75.5	76.1	73.1	-0.003	0.011
			ELA	3 or higher	77.9	78.4	75.5	-0.006	0.026
				4 or higher	75.2	76.0	71.9	-0.005	0.020
US Govt and Politics	4,300	750	E+R	3 or higher	73.5	73.9	70.7	0.006	-0.037
				4 or higher	78.5	78.4	78.9	0.003	-0.019
			ELA	3 or higher	73.6	74.0	71.0	0.005	-0.031
				4 or higher	78.4	78.2	79.7	0.002	-0.013
US History	8,610	7,059	E+R	3 or higher	73.6	74.4	72.3	0.007	-0.010
				4 or higher	76.6	75.7	77.7	0.013	-0.019
			ELA	3 or higher	73.6	74.5	72.4	-0.001	0.001
				4 or higher	76.3	75.3	77.7	0.005	-0.007
World History	1,666	7,009	E+R	3 or higher	74.7	77.7	73.9	0.014	-0.004
				4 or higher	76.7	73.2	77.7	0.013	-0.004
			ELA	3 or higher	74.7	78.4	73.6	0.011	-0.003
				4 or higher	76.5	72.5	77.7	0.008	-0.002

Table A6. Classification Accuracy and Average Residuals by ACT Test Source—continued

	Sample Size				Classification Accuracy			Average Residual	
AP course	PreACT/ ACT sample	ACT Aspire sample	Score	Outcome	Overall	PreACT/ ACT sample	ACT Aspire sample	PreACT/ ACT sample	ACT Aspire sample
STEM-related									
Biology	6,518	1,960	STEM	3 or higher	80.7	81.1	79.3	-0.001	0.004
				4 or higher	82.5	83.1	80.6	-0.003	0.012
Calculus AB	3,556	427	STEM	3 or higher	73.6	73.2	76.4	0.000	0.002
				4 or higher	75.4	76.0	71.5	0.001	-0.010
Chemistry	4,517	640	STEM	3 or higher	78.1	77.3	82.4	-0.006	0.030
				4 or higher	79.3	80.1	74.7	-0.006	0.031
Computer Science A	811	280	STEM	3 or higher	79.1	78.1	82.4	-0.006	0.019
				4 or higher	74.6	73.1	79.5	-0.008	0.027
Environmental Science	3,039	604	STEM	3 or higher	77.9	77.9	77.8	-0.005	0.025
				4 or higher	81.2	80.4	85.1	-0.001	0.008
Macro-economics	858	120	STEM	3 or higher	75.4	75.6	74.4	-0.003	0.021
				4 or higher	74.4	73.4	82.5	-0.001	0.011
Micro-economics	873	38	STEM	3 or higher	79.8	80.4	67.9	0.001	-0.030
				4 or higher	74.7	75.1	66.4	0.001	-0.021
Physics 1	2,504	1,124	STEM	3 or higher	79.3	78.6	81.0	0.009	-0.021
				4 or higher	83.1	82.0	85.6	0.007	-0.015
Physics C: E and M	98	2	STEM	3 or higher	77.3	77.6		0.005	
				4 or higher	74.5	74.1		0.001	
Physics C: Mechanics	369	44	STEM	3 or higher	83.4	82.7	88.6	0.002	-0.015
				4 or higher	72.3	71.4	78.3	-0.005	0.038
Statistics	5,550	452	STEM	3 or higher	80.1	80.0	82.0	0.002	-0.022
				4 or higher	79.6	79.5	81.0	0.001	-0.016
Other									
Art History	581	153	Comp.	3 or higher	72.6	71.9	75.2	-0.014	0.051
				4 or higher	73.0	72.9	73.3	-0.004	0.016
Music Theory	926	152	Comp.	3 or higher	74.2	74.6	71.1	0.000	0.001
				4 or higher	72.6	72.4	73.9	0.002	-0.019

Note. E+R = English + Reading score.

Table A7. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire E+R Score for AP English Language and Composition, AP English Literature and Composition, and AP European History

E+R Score		AP English Lang. and Composition				AP English Lit. and Composition				AP European History			
		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
20	824-825	0.017	0.010	0.003	0.002	0.004	0.003	0.001	0.000	0.057	0.026	0.003	0.001
21	826-827	0.020	0.012	0.004	0.002	0.005	0.003	0.001	0.000	0.063	0.030	0.003	0.001
22	828-829	0.024	0.014	0.004	0.002	0.006	0.004	0.001	0.000	0.070	0.033	0.004	0.001
23	830-832	0.029	0.017	0.005	0.003	0.007	0.005	0.001	0.000	0.077	0.037	0.005	0.001
24	833-834	0.035	0.020	0.006	0.003	0.008	0.006	0.001	0.001	0.085	0.042	0.005	0.002
25	835-837	0.041	0.024	0.007	0.004	0.010	0.007	0.001	0.001	0.094	0.047	0.006	0.002
26	838-839	0.049	0.029	0.009	0.005	0.012	0.008	0.001	0.001	0.104	0.053	0.007	0.002
27	840-841	0.058	0.035	0.010	0.005	0.015	0.010	0.002	0.001	0.115	0.059	0.009	0.003
28	842-844	0.069	0.041	0.012	0.007	0.018	0.012	0.002	0.001	0.126	0.066	0.010	0.003
29	845-846	0.081	0.049	0.015	0.008	0.021	0.015	0.003	0.001	0.139	0.074	0.012	0.004
30	847-848	0.096	0.059	0.017	0.009	0.025	0.018	0.003	0.002	0.153	0.083	0.014	0.005
31	849-850	0.112	0.070	0.020	0.011	0.031	0.021	0.004	0.002	0.167	0.093	0.016	0.006
32	851-852	0.132	0.083	0.024	0.013	0.037	0.026	0.004	0.003	0.183	0.103	0.019	0.007
33	853	0.154	0.098	0.029	0.016	0.044	0.031	0.005	0.003	0.200	0.115	0.022	0.008
34	854-855	0.179	0.115	0.034	0.019	0.052	0.038	0.006	0.004	0.218	0.128	0.026	0.010
35	856-857	0.207	0.135	0.040	0.022	0.062	0.045	0.008	0.005	0.238	0.142	0.030	0.011
36	858	0.238	0.158	0.047	0.027	0.074	0.054	0.009	0.006	0.258	0.158	0.035	0.014
37	859-860	0.272	0.185	0.055	0.032	0.088	0.065	0.011	0.007	0.280	0.175	0.041	0.016
38	861	0.309	0.214	0.065	0.038	0.105	0.078	0.013	0.008	0.303	0.193	0.047	0.019
39	862-863	0.349	0.247	0.076	0.044	0.123	0.093	0.016	0.010	0.327	0.213	0.055	0.023
40	864	0.392	0.283	0.089	0.053	0.145	0.110	0.019	0.012	0.352	0.234	0.063	0.027
41	865-866	0.435	0.322	0.104	0.062	0.170	0.130	0.023	0.015	0.378	0.257	0.073	0.032
42	867	0.480	0.363	0.121	0.074	0.198	0.154	0.028	0.018	0.405	0.281	0.085	0.038
43	868	0.526	0.407	0.141	0.087	0.229	0.180	0.033	0.022	0.432	0.306	0.098	0.046
44	869	0.570	0.452	0.163	0.102	0.264	0.211	0.040	0.027	0.460	0.333	0.113	0.054
45	870-871	0.614	**0.498**	0.188	0.119	0.302	0.244	0.048	0.032	0.488	0.361	0.130	0.064

Table A7. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire E+R Score for AP English Language and Composition, AP English Literature and Composition, and AP European History—continued

E+R Score		AP English Lang. and Composition				AP English Lit. and Composition				AP European History			
		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
46	872	0.656	0.545	0.215	0.139	0.343	0.282	0.057	0.039	0.517	0.390	0.148	0.075
47	873	0.696	0.590	0.246	0.162	0.386	0.322	0.068	0.047	0.545	0.420	0.169	0.088
48	874	0.733	0.634	0.279	0.188	0.431	0.365	0.081	0.057	0.573	0.451	0.193	0.104
49	875	0.767	0.676	0.315	0.217	0.478	0.411	0.096	0.068	0.601	0.482	0.218	0.121
50	876	0.798	0.715	0.353	0.248	0.525	0.458	0.113	0.082	0.628	0.514	0.247	0.142
51	877	0.826	0.751	0.393	0.283	0.571	0.507	0.134	0.098	0.654	0.545	0.277	0.165
52		0.850	0.784	0.435	0.321	0.617	0.555	0.157	0.117	0.680	0.576	0.310	0.190
53	878	0.872	0.814	0.478	0.361	0.660	0.602	0.183	0.139	0.705	0.606	0.344	0.219
54	879	0.891	0.841	0.521	0.403	0.701	0.647	0.213	0.164	0.728	0.636	0.381	0.251
55	880	0.907	0.864	0.564	0.447	0.739	0.690	0.247	0.193	0.750	0.665	0.418	0.286
56		0.922	0.884	0.606	0.491	0.774	0.730	0.283	0.226	0.771	0.692	0.457	0.323
57	881	0.934	0.902	0.646	0.536	0.805	0.767	0.323	0.262	0.791	0.718	0.496	0.363
58		0.944	0.917	0.684	0.580	0.833	0.800	0.366	0.303	0.809	0.743	0.535	0.405
59	882	0.953	0.930	0.720	0.623	0.858	0.829	0.411	0.346	0.826	0.767	0.574	0.448
60	883	0.960	0.941	0.754	0.664	0.879	0.855	0.457	0.392	0.842	0.788	0.611	0.492
61		0.967	0.951	0.784	0.702	0.898	0.877	0.504	0.441	0.857	0.809	0.648	0.536
62	884	0.972	0.959	0.812	0.738	0.914	0.897	0.552	0.490	0.870	0.827	0.682	0.579
63	885	0.977	0.965	0.837	0.771	0.928	0.913	0.598	0.540	0.883	0.844	0.715	0.621
64		0.980	0.971	0.859	0.801	0.940	0.928	0.642	0.589	0.894	0.860	0.746	0.661
65	886	0.984	0.976	0.879	0.828	0.950	0.940	0.685	0.636	0.904	0.875	0.774	0.699
66	887	0.986	0.980	0.896	0.852	0.958	0.950	0.724	0.681	0.914	0.888	0.800	0.735
67	888	0.989	0.983	0.911	0.873	0.965	0.958	0.760	0.723	0.922	0.900	0.824	0.767
68	889	0.990	0.986	0.924	0.892	0.971	0.965	0.793	0.761	0.930	0.910	0.845	0.797
69	890-891	0.992	0.988	0.935	0.908	0.976	0.971	0.823	0.795	0.937	0.920	0.864	0.824
70	892-893	0.993	0.990	0.945	0.922	0.980	0.976	0.849	0.826	0.943	0.929	0.881	0.848
71	894-895	0.994	0.992	0.953	0.933	0.983	0.980	0.871	0.852	0.949	0.936	0.897	0.869
72	896-898	0.995	0.993	0.960	0.944	0.986	0.984	0.891	0.876	0.954	0.943	0.910	0.887

Table A8. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire E+R Score for AP Human Geography, AP Psychology, and AP US Government and Politics

E+R score		AP Human Geography				AP Psychology				AP US Govt and Politics			
		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	
20	824-825	0.053	0.053	0.019	0.019	0.059	0.037	0.029	0.015	0.024	0.018	0.005	0.003
21	826-827	0.060	0.060	0.022	0.022	0.068	0.042	0.033	0.017	0.028	0.020	0.006	0.004
22	828-829	0.068	0.068	0.025	0.025	0.077	0.049	0.037	0.020	0.032	0.023	0.007	0.004
23	830-832	0.077	0.077	0.028	0.028	0.088	0.056	0.042	0.023	0.036	0.026	0.008	0.005
24	833-834	0.088	0.088	0.032	0.032	0.100	0.065	0.048	0.026	0.041	0.030	0.009	0.006
25	835-837	0.099	0.099	0.036	0.036	0.114	0.074	0.055	0.030	0.047	0.034	0.010	0.007
26	838-839	0.112	0.112	0.040	0.040	0.129	0.085	0.062	0.034	0.054	0.039	0.012	0.008
27	840-841	0.127	0.127	0.045	0.045	0.146	0.097	0.071	0.039	0.061	0.044	0.014	0.009
28	842-844	0.143	0.143	0.051	0.051	0.165	0.111	0.080	0.045	0.070	0.050	0.015	0.010
29	845-846	0.160	0.160	0.057	0.057	0.185	0.127	0.091	0.052	0.079	0.057	0.018	0.012
30	847-848	0.180	0.180	0.064	0.064	0.207	0.144	0.103	0.059	0.090	0.065	0.020	0.013
31	849-850	0.201	0.201	0.072	0.072	0.232	0.163	0.116	0.068	0.102	0.074	0.023	0.015
32	851-852	0.223	0.223	0.081	0.081	0.258	0.184	0.131	0.077	0.115	0.084	0.026	0.018
33	853	0.248	0.248	0.091	0.091	0.285	0.207	0.147	0.088	0.130	0.095	0.030	0.020
34	854-855	0.274	0.274	0.101	0.101	0.315	0.232	0.164	0.100	0.146	0.107	0.034	0.023
35	856-857	0.301	0.301	0.113	0.113	0.346	0.259	0.184	0.114	0.164	0.120	0.039	0.026
36	858	0.330	0.330	0.126	0.126	0.379	0.289	0.205	0.129	0.183	0.135	0.044	0.030
37	859-860	0.361	0.361	0.140	0.140	0.413	0.320	0.227	0.146	0.205	0.152	0.050	0.034
38	861	0.392	0.392	0.156	0.156	0.448	0.353	0.252	0.164	0.228	0.170	0.057	0.039
39	862-863	0.425	0.425	0.173	0.173	0.483	0.387	0.278	0.185	0.253	0.190	0.065	0.045
40	864	0.457	0.457	0.191	0.191	0.519	0.422	0.306	0.207	0.279	0.211	0.073	0.051
41	865-866	0.490	0.490	0.211	0.211	0.555	0.459	0.335	0.231	0.307	0.234	0.083	0.058
42	867	0.524	0.524	0.232	0.232	0.590	0.496	0.365	0.257	0.337	0.259	0.094	0.066
43	868	0.556	0.556	0.255	0.255	0.625	0.533	0.397	0.285	0.368	0.286	0.106	0.075
44	869	0.589	0.589	0.279	0.279	0.658	0.570	0.429	0.314	0.400	0.313	0.119	0.085
45	870-871	0.620	0.620	0.305	0.305	0.691	0.607	0.462	0.346	0.432	0.343	0.134	0.097
46	872	0.651	0.651	0.332	0.332	0.721	0.642	0.496	0.378	0.466	0.373	0.151	0.109

Table A8. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire E+R Score for AP Human Geography, AP Psychology, and AP US Government and Politics—continued

E+R score		AP Human Geography				AP Psychology				AP US Govt and Politics			
		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	
47	873	0.680	0.680	0.359	0.359	0.750	0.676	0.530	0.412	0.500	0.405	0.168	0.123
48	874	0.708	0.708	0.388	0.388	0.777	0.709	0.563	0.447	0.533	0.437	0.188	0.139
49	875	0.735	0.735	0.418	0.418	0.802	0.739	0.596	0.482	0.567	0.470	0.209	0.156
50	876	0.759	0.759	0.448	0.448	0.825	0.768	0.628	0.517	0.600	0.503	0.232	0.175
51	877	0.783	0.783	0.479	0.479	0.845	0.794	0.660	0.553	0.632	0.537	0.257	0.195
52		0.804	0.804	0.510	0.510	0.864	0.819	0.690	0.587	0.663	0.569	0.283	0.218
53	878	0.824	0.824	0.541	0.541	0.881	0.841	0.718	0.622	0.692	0.602	0.311	0.242
54	879	0.843	0.843	0.572	0.572	0.896	0.860	0.745	0.655	0.721	0.633	0.340	0.268
55	880	0.860	0.860	0.602	0.602	0.909	0.878	0.770	0.686	0.747	0.663	0.371	0.295
56		0.875	0.875	0.631	0.631	0.921	0.894	0.794	0.716	0.772	0.693	0.403	0.324
57	881	0.889	0.889	0.660	0.660	0.931	0.908	0.816	0.745	0.795	0.720	0.436	0.355
58		0.901	0.901	0.687	0.687	0.941	0.920	0.836	0.771	0.817	0.746	0.469	0.387
59	882	0.913	0.913	0.714	0.714	0.948	0.931	0.854	0.796	0.836	0.771	0.503	0.420
60	883	0.923	0.923	0.739	0.739	0.955	0.941	0.870	0.818	0.854	0.794	0.536	0.454
61		0.932	0.932	0.762	0.762	0.962	0.949	0.885	0.839	0.870	0.815	0.570	0.488
62	884	0.940	0.940	0.784	0.784	0.967	0.956	0.899	0.858	0.885	0.834	0.603	0.522
63	885	0.947	0.947	0.805	0.805	0.971	0.962	0.911	0.875	0.898	0.852	0.635	0.557
64		0.954	0.954	0.824	0.824	0.975	0.967	0.922	0.890	0.910	0.868	0.666	0.591
65	886	0.959	0.959	0.842	0.842	0.979	0.972	0.931	0.904	0.921	0.883	0.696	0.624
66	887	0.964	0.964	0.858	0.858	0.982	0.976	0.940	0.916	0.930	0.896	0.724	0.656
67	888	0.969	0.969	0.873	0.873	0.984	0.979	0.947	0.926	0.939	0.908	0.751	0.687
68	889	0.973	0.973	0.886	0.886	0.986	0.982	0.954	0.936	0.946	0.919	0.776	0.716
69	890-891	0.976	0.976	0.898	0.898	0.988	0.985	0.960	0.944	0.953	0.928	0.799	0.743
70	892-893	0.979	0.979	0.909	0.909	0.990	0.987	0.965	0.951	0.959	0.937	0.820	0.769
71	894-895	0.982	0.982	0.919	0.919	0.991	0.989	0.969	0.958	0.964	0.944	0.840	0.793
72	896-898	0.984	0.984	0.928	0.928	0.993	0.991	0.973	0.963	0.968	0.951	0.857	0.815

Table A9. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire E+R Score for AP US History and AP World History

E+R score		AP US History				AP World History			
		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
20	824-825	0.036	0.023	0.016	0.010	0.075	0.036	0.031	0.013
21	826-827	0.041	0.027	0.018	0.011	0.085	0.041	0.034	0.014
22	828-829	0.047	0.031	0.020	0.013	0.095	0.048	0.038	0.016
23	830-832	0.053	0.035	0.022	0.014	0.107	0.054	0.042	0.018
24	833-834	0.061	0.040	0.025	0.016	0.121	0.062	0.047	0.021
25	835-837	0.069	0.046	0.028	0.018	0.135	0.071	0.052	0.023
26	838-839	0.078	0.052	0.032	0.020	0.151	0.082	0.058	0.026
27	840-841	0.089	0.059	0.036	0.023	0.168	0.093	0.065	0.030
28	842-844	0.101	0.067	0.040	0.026	0.188	0.106	0.072	0.034
29	845-846	0.114	0.077	0.045	0.029	0.208	0.121	0.079	0.038
30	847-848	0.128	0.087	0.050	0.033	0.231	0.137	0.088	0.043
31	849-850	0.144	0.099	0.056	0.037	0.255	0.155	0.097	0.048
32	851-852	0.162	0.112	0.063	0.042	0.280	0.175	0.107	0.055
33	853	0.182	0.127	0.071	0.047	0.307	0.197	0.118	0.062
34	854-855	0.203	0.143	0.079	0.053	0.336	0.221	0.130	0.069
35	856-857	0.226	0.161	0.088	0.060	0.365	0.246	0.143	0.078
36	858	0.251	0.180	0.098	0.067	0.396	0.274	0.158	0.087
37	859-860	0.277	0.202	0.109	0.075	0.427	0.304	0.173	0.098
38	861	0.305	0.225	0.121	0.084	0.460	0.335	0.189	0.109
39	862-863	0.335	0.250	0.135	0.094	0.492	0.368	0.207	0.122
40	864	0.366	0.277	0.149	0.105	0.525	0.403	0.226	0.136
41	865-866	0.398	0.305	0.165	0.117	0.557	0.438	0.246	0.152
42	867	0.432	0.335	0.182	0.131	0.589	0.474	0.267	0.169
43	868	0.465	0.367	0.201	0.146	0.620	0.510	0.289	0.187
44	869	0.499	0.400	0.221	0.162	0.650	0.546	0.312	0.207
45	870-871	0.533	0.433	0.242	0.179	0.679	0.581	0.337	0.229
46	872	0.567	0.468	0.265	0.198	0.707	0.616	0.362	0.252
47	873	0.600	0.502	0.289	0.218	0.733	0.650	0.388	0.276
48	874	0.633	0.537	0.314	0.240	0.758	0.682	0.414	0.302
49	875	0.664	0.571	0.340	0.263	0.781	0.712	0.442	0.329
50	876	0.694	0.605	0.368	0.288	0.803	0.741	0.469	0.357

Table A9. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire E+R Score for AP US History and AP World History—continued

E+R score		AP US History				AP World History			
		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
51	877	0.722	0.637	0.396	0.314	0.823	0.768	0.497	0.386
52		0.748	0.669	0.425	0.341	0.841	0.793	0.524	0.417
53	878	0.773	0.699	0.454	0.370	0.858	0.815	0.552	0.447
54	879	0.796	0.727	0.484	0.399	0.873	0.836	0.579	0.479
55	880	0.818	0.754	0.514	0.429	0.887	0.855	0.606	0.510
56		0.837	0.778	0.544	0.459	0.899	0.872	0.632	0.541
57	881	0.855	0.801	0.573	0.490	0.910	0.887	0.657	0.572
58		0.871	0.823	0.602	0.521	0.920	0.901	0.682	0.603
59	882	0.886	0.842	0.630	0.551	0.929	0.913	0.705	0.632
60	883	0.899	0.860	0.658	0.582	0.938	0.924	0.728	0.661
61		0.911	0.876	0.684	0.612	0.945	0.934	0.749	0.689
62	884	0.921	0.890	0.709	0.640	0.951	0.942	0.769	0.715
63	885	0.931	0.903	0.733	0.668	0.957	0.949	0.788	0.740
64		0.939	0.914	0.756	0.695	0.962	0.956	0.806	0.763
65	886	0.946	0.925	0.778	0.721	0.966	0.962	0.823	0.785
66	887	0.953	0.934	0.798	0.745	0.970	0.967	0.839	0.805
67	888	0.959	0.942	0.816	0.768	0.974	0.971	0.853	0.824
68	889	0.964	0.949	0.834	0.789	0.977	0.975	0.866	0.842
69	890-891	0.968	0.955	0.850	0.809	0.980	0.978	0.879	0.858
70	892-893	0.972	0.961	0.864	0.827	0.982	0.981	0.890	0.873
71	894-895	0.976	0.966	0.878	0.844	0.984	0.984	0.900	0.886
72	896-898	0.979	0.970	0.890	0.860	0.986	0.986	0.910	0.898

Table A10. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire ELA Score for AP English Language and Composition, AP English Literature and Composition, and AP European History

		AP English Lang. and Composition				AP English Lit. and Composition				AP European History			
ELA score		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	426	0.107	0.061	0.018	0.009	0.027	0.019	0.003	0.002	0.177	0.097	0.029	0.008
16	428	0.155	0.092	0.027	0.014	0.042	0.029	0.005	0.003	0.216	0.123	0.039	0.012
17	429	0.219	0.136	0.040	0.021	0.064	0.046	0.008	0.005	0.260	0.156	0.053	0.017
18	431	0.299	0.197	0.059	0.032	0.095	0.070	0.012	0.007	0.311	0.196	0.071	0.025
19	432	0.395	0.276	0.086	0.049	0.141	0.106	0.019	0.012	0.367	0.244	0.095	0.036
20	433	0.500	0.372	0.125	0.074	0.203	0.158	0.029	0.019	0.427	0.299	0.126	0.052
21	434	0.604	0.481	0.178	0.110	0.284	0.228	0.044	0.030	0.490	0.361	0.165	0.075
22	435	0.701	0.591	0.247	0.160	0.382	0.318	0.067	0.047	0.554	0.429	0.213	0.106
23	436	0.782	0.693	0.331	0.228	0.491	0.424	0.102	0.073	0.617	0.500	0.271	0.148
24	437	0.846	0.779	0.429	0.313	0.601	0.538	0.151	0.112	0.677	0.571	0.338	0.203
25	438	0.894	0.846	0.533	0.414	0.703	0.649	0.218	0.168	0.731	0.641	0.412	0.272
26	438	0.928	0.896	0.633	0.522	0.787	0.746	0.304	0.245	0.780	0.705	0.490	0.354
27	439	0.952	0.931	0.724	0.628	0.853	0.823	0.407	0.343	0.822	0.761	0.569	0.445
28	440	0.968	0.954	0.799	0.723	0.901	0.881	0.520	0.457	0.857	0.810	0.644	0.540
29	441	0.979	0.970	0.858	0.802	0.935	0.922	0.631	0.576	0.886	0.850	0.713	0.633
30	441	0.986	0.981	0.901	0.862	0.957	0.949	0.730	0.686	0.909	0.883	0.773	0.716
31	442	0.991	0.988	0.933	0.906	0.972	0.968	0.810	0.780	0.929	0.910	0.824	0.787
32	443	0.994	0.992	0.955	0.937	0.982	0.979	0.870	0.851	0.944	0.931	0.865	0.845
33	445	0.996	0.995	0.970	0.959	0.989	0.987	0.914	0.902	0.956	0.947	0.898	0.889
34	446	0.997	0.997	0.980	0.973	0.993	0.992	0.944	0.937	0.965	0.959	0.924	0.921
35	447	0.998	0.998	0.986	0.982	0.995	0.995	0.963	0.960	0.973	0.969	0.943	0.945
36	449	0.999	0.999	0.991	0.988	0.997	0.997	0.976	0.975	0.979	0.976	0.958	0.962

Table A11. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire ELA Score for AP Human Geography, AP Psychology, and AP US Government and Politics

		AP Human Geography				AP Psychology				AP US Govt and Politics			
ELA score		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	426	0.221	0.221	0.083	0.083	0.239	0.178	0.120	0.074	0.099	0.071	0.022	0.015
16	428	0.277	0.277	0.106	0.106	0.300	0.229	0.155	0.099	0.131	0.095	0.030	0.020
17	429	0.341	0.341	0.134	0.134	0.369	0.290	0.199	0.130	0.172	0.126	0.040	0.028
18	431	0.410	0.410	0.168	0.168	0.444	0.360	0.251	0.170	0.221	0.164	0.054	0.038
19	432	0.483	0.483	0.209	0.209	0.523	0.436	0.311	0.219	0.280	0.212	0.073	0.052
20	433	0.556	0.556	0.257	0.257	0.603	0.517	0.379	0.277	0.347	0.268	0.098	0.070
21	434	0.627	0.627	0.311	0.311	0.678	0.599	0.453	0.344	0.421	0.333	0.130	0.094
22	435	0.692	0.692	0.372	0.372	0.746	0.676	0.529	0.418	0.498	0.404	0.170	0.125
23	436	0.751	0.751	0.436	0.436	0.805	0.746	0.605	0.497	0.576	0.480	0.218	0.164
24	437	0.802	0.802	0.504	0.504	0.853	0.805	0.676	0.576	0.650	0.557	0.277	0.213
25	438	0.845	0.845	0.572	0.572	0.891	0.854	0.741	0.653	0.718	0.631	0.343	0.271
26	438	0.880	0.880	0.637	0.637	0.921	0.892	0.797	0.723	0.777	0.700	0.417	0.338
27	439	0.909	0.909	0.698	0.698	0.942	0.922	0.844	0.784	0.827	0.761	0.495	0.413
28	440	0.931	0.931	0.754	0.754	0.959	0.944	0.882	0.835	0.868	0.813	0.573	0.492
29	441	0.948	0.948	0.802	0.802	0.970	0.960	0.912	0.876	0.900	0.856	0.649	0.571
30	441	0.961	0.961	0.843	0.843	0.979	0.971	0.935	0.908	0.926	0.891	0.717	0.648
31	442	0.971	0.971	0.876	0.876	0.985	0.980	0.952	0.932	0.945	0.918	0.778	0.718
32	443	0.979	0.979	0.904	0.904	0.989	0.985	0.965	0.951	0.959	0.939	0.829	0.779
33	445	0.984	0.984	0.926	0.926	0.992	0.990	0.974	0.964	0.970	0.954	0.870	0.830
34	446	0.989	0.989	0.943	0.943	0.995	0.993	0.981	0.974	0.978	0.966	0.902	0.872
35	447	0.992	0.992	0.956	0.956	0.996	0.995	0.986	0.981	0.984	0.975	0.928	0.904
36	449	0.994	0.994	0.966	0.966	0.997	0.996	0.990	0.987	0.988	0.982	0.947	0.929

Table A12. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire ELA Score for AP US History and AP World History

		AP US History				AP World History			
ELA score		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	426	0.139	0.095	0.054	0.034	0.252	0.155	0.085	0.044
16	428	0.182	0.127	0.070	0.045	0.313	0.204	0.108	0.059
17	429	0.236	0.168	0.091	0.060	0.380	0.264	0.138	0.079
18	431	0.299	0.220	0.118	0.079	0.453	0.334	0.173	0.104
19	432	0.371	0.281	0.151	0.104	0.528	0.413	0.215	0.137
20	433	0.449	0.352	0.192	0.136	0.601	0.496	0.265	0.177
21	434	0.530	0.430	0.240	0.175	0.670	0.579	0.321	0.226
22	435	0.609	0.512	0.296	0.223	0.733	0.658	0.382	0.284
23	436	0.683	0.593	0.359	0.279	0.787	0.730	0.448	0.351
24	437	0.749	0.669	0.427	0.343	0.833	0.791	0.515	0.423
25	438	0.805	0.738	0.498	0.413	0.871	0.841	0.582	0.499
26	438	0.851	0.796	0.569	0.487	0.901	0.881	0.646	0.575
27	439	0.888	0.845	0.637	0.562	0.925	0.912	0.705	0.648
28	440	0.917	0.883	0.700	0.634	0.943	0.936	0.758	0.714
29	441	0.938	0.913	0.757	0.701	0.957	0.953	0.804	0.772
30	441	0.955	0.936	0.805	0.760	0.968	0.966	0.843	0.821
31	442	0.967	0.953	0.847	0.810	0.976	0.976	0.876	0.862
32	443	0.976	0.966	0.880	0.852	0.982	0.982	0.902	0.894
33	445	0.983	0.975	0.907	0.886	0.987	0.987	0.924	0.920
34	446	0.987	0.982	0.929	0.913	0.990	0.991	0.941	0.940
35	447	0.991	0.987	0.946	0.934	0.993	0.994	0.954	0.955
36	449	0.993	0.991	0.959	0.951	0.995	0.995	0.965	0.966

Table A13. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire STEM Score for AP Biology, AP Calculus AB, and AP Chemistry

		AP Biology				AP Calculus AB				AP Chemistry			
STEM score		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	420	0.026	0.021	0.001	0.002	0.026	0.026	0.007	0.007	0.015	0.007	0.010	0.003
16	422	0.043	0.035	0.002	0.003	0.038	0.038	0.011	0.011	0.024	0.012	0.015	0.005
17	425	0.072	0.058	0.004	0.005	0.054	0.054	0.016	0.016	0.037	0.019	0.021	0.007
18	427	0.117	0.094	0.007	0.009	0.077	0.077	0.023	0.023	0.057	0.032	0.030	0.011
19	430	0.183	0.147	0.013	0.015	0.109	0.109	0.033	0.033	0.088	0.051	0.043	0.017
20	432	0.274	0.223	0.023	0.025	0.151	0.151	0.048	0.048	0.134	0.081	0.061	0.025
21	433	0.385	0.322	0.040	0.041	0.206	0.206	0.069	0.069	0.197	0.127	0.086	0.038
22	435	0.508	0.436	0.070	0.066	0.273	0.273	0.099	0.099	0.279	0.193	0.120	0.057
23	436	0.630	0.557	0.120	0.106	0.352	0.352	0.138	0.138	0.377	0.280	0.164	0.085
24	438	0.737	0.670	0.195	0.164	0.439	0.439	0.190	0.190	0.484	0.386	0.219	0.123
25	439	0.823	0.768	0.300	0.245	0.529	0.529	0.256	0.256	0.589	0.500	0.285	0.176
26	440	0.885	0.844	0.430	0.348	0.617	0.617	0.333	0.333	0.684	0.610	0.361	0.243
27	442	0.928	0.899	0.571	0.467	0.697	0.697	0.420	0.420	0.764	0.707	0.443	0.325
28	442	0.956	0.937	0.702	0.590	0.767	0.767	0.512	0.512	0.827	0.786	0.528	0.417
29	443	0.974	0.961	0.809	0.704	0.825	0.825	0.603	0.603	0.876	0.848	0.610	0.514
30	444	0.984	0.976	0.885	0.799	0.870	0.870	0.687	0.687	0.913	0.894	0.686	0.609
31	445	0.991	0.986	0.933	0.870	0.906	0.906	0.761	0.761	0.939	0.928	0.754	0.696
32	446	0.995	0.991	0.963	0.919	0.932	0.932	0.822	0.822	0.958	0.951	0.811	0.771
33	447	0.997	0.995	0.979	0.951	0.952	0.952	0.870	0.870	0.971	0.968	0.858	0.833
34	449	0.998	0.997	0.989	0.970	0.966	0.966	0.907	0.907	0.980	0.979	0.896	0.881
35	452	0.999	0.998	0.994	0.982	0.976	0.976	0.934	0.934	0.987	0.986	0.924	0.918
36	455	0.999	0.999	0.997	0.990	0.983	0.983	0.954	0.954	0.991	0.991	0.946	0.944

Table A14. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire STEM Score for AP Computer Science A, AP Environmental Science, and AP Macroeconomics

STEM score		AP Computer Science A				AP Environmental Science				AP Macroeconomics			
		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	420	0.037	0.037	0.010	0.010	0.031	0.025	0.007	0.007	0.035	0.029	0.011	0.010
16	422	0.051	0.051	0.014	0.014	0.046	0.038	0.011	0.012	0.050	0.040	0.016	0.014
17	425	0.071	0.071	0.019	0.019	0.069	0.056	0.018	0.018	0.071	0.055	0.023	0.020
18	427	0.098	0.098	0.027	0.027	0.101	0.083	0.029	0.028	0.100	0.076	0.033	0.028
19	430	0.135	0.135	0.039	0.039	0.146	0.121	0.045	0.043	0.140	0.104	0.048	0.039
20	432	0.184	0.184	0.054	0.054	0.207	0.173	0.071	0.065	0.191	0.140	0.070	0.055
21	433	0.247	0.247	0.077	0.077	0.284	0.242	0.109	0.098	0.256	0.186	0.100	0.077
22	435	0.326	0.326	0.107	0.107	0.378	0.327	0.164	0.145	0.332	0.243	0.141	0.106
23	436	0.418	0.418	0.149	0.149	0.481	0.425	0.238	0.209	0.418	0.309	0.195	0.145
24	438	0.516	0.516	0.204	0.204	0.587	0.531	0.334	0.292	0.507	0.383	0.262	0.194
25	439	0.613	0.613	0.273	0.273	0.686	0.634	0.445	0.391	0.595	0.462	0.342	0.254
26	440	0.700	0.700	0.356	0.356	0.771	0.727	0.561	0.500	0.677	0.542	0.431	0.324
27	442	0.774	0.774	0.448	0.448	0.838	0.803	0.671	0.609	0.749	0.619	0.522	0.402
28	442	0.833	0.833	0.544	0.544	0.889	0.862	0.766	0.708	0.810	0.690	0.612	0.483
29	443	0.878	0.878	0.635	0.635	0.925	0.906	0.840	0.791	0.859	0.754	0.694	0.565
30	444	0.911	0.911	0.716	0.716	0.950	0.936	0.893	0.855	0.896	0.807	0.765	0.643
31	445	0.935	0.935	0.783	0.783	0.967	0.958	0.931	0.902	0.925	0.852	0.824	0.713
32	446	0.953	0.953	0.838	0.838	0.978	0.972	0.956	0.935	0.946	0.888	0.871	0.775
33	447	0.966	0.966	0.880	0.880	0.986	0.981	0.972	0.957	0.962	0.916	0.907	0.826
34	449	0.975	0.975	0.912	0.912	0.991	0.988	0.982	0.972	0.973	0.937	0.933	0.868
35	452	0.982	0.982	0.936	0.936	0.994	0.992	0.989	0.982	0.981	0.953	0.953	0.901
36	455	0.987	0.987	0.953	0.953	0.996	0.995	0.993	0.989	0.987	0.966	0.967	0.927

Table A15. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire STEM Score for AP Microeconomics, AP Physics 1, and AP Physics C: Electricity and Magnetism

STEM score		AP Microeconomics				AP Physics 1				AP Physics C: Electricity and Magnetism			
		3 or higher		4 or higher		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	420	0.070	0.024	0.042	0.011	0.004	0.004	0.001	0.001	0.051	0.004	0.010	0.001
16	422	0.096	0.035	0.056	0.016	0.006	0.006	0.002	0.002	0.064	0.006	0.014	0.002
17	425	0.130	0.051	0.074	0.023	0.010	0.010	0.003	0.003	0.081	0.008	0.020	0.003
18	427	0.172	0.074	0.097	0.032	0.016	0.016	0.004	0.004	0.102	0.013	0.028	0.004
19	430	0.225	0.104	0.127	0.045	0.026	0.026	0.006	0.006	0.128	0.020	0.038	0.006
20	432	0.288	0.145	0.163	0.062	0.041	0.041	0.010	0.010	0.158	0.031	0.053	0.010
21	433	0.359	0.198	0.207	0.086	0.065	0.065	0.016	0.016	0.195	0.047	0.072	0.015
22	435	0.437	0.264	0.259	0.117	0.100	0.100	0.025	0.025	0.238	0.070	0.098	0.024
23	436	0.518	0.341	0.318	0.157	0.150	0.150	0.039	0.039	0.288	0.105	0.131	0.036
24	438	0.599	0.426	0.385	0.207	0.220	0.220	0.060	0.060	0.345	0.154	0.174	0.056
25	439	0.676	0.517	0.456	0.267	0.310	0.310	0.091	0.091	0.407	0.222	0.227	0.084
26	440	0.745	0.608	0.531	0.338	0.416	0.416	0.136	0.136	0.475	0.308	0.292	0.126
27	442	0.804	0.692	0.605	0.417	0.529	0.529	0.198	0.198	0.545	0.413	0.367	0.185
28	442	0.852	0.766	0.675	0.501	0.639	0.639	0.280	0.280	0.615	0.528	0.453	0.264
29	443	0.890	0.827	0.740	0.586	0.735	0.735	0.379	0.379	0.680	0.641	0.547	0.364
30	444	0.920	0.875	0.796	0.668	0.813	0.813	0.488	0.488	0.739	0.740	0.641	0.483
31	445	0.942	0.912	0.843	0.742	0.873	0.873	0.598	0.598	0.791	0.820	0.727	0.606
32	446	0.958	0.939	0.881	0.805	0.915	0.915	0.698	0.698	0.833	0.878	0.798	0.718
33	447	0.970	0.958	0.911	0.856	0.944	0.944	0.783	0.783	0.868	0.919	0.854	0.807
34	449	0.979	0.971	0.934	0.895	0.964	0.964	0.848	0.848	0.896	0.947	0.895	0.871
35	452	0.985	0.980	0.952	0.925	0.977	0.977	0.897	0.897	0.918	0.965	0.924	0.916
36	455	0.989	0.987	0.965	0.947	0.985	0.985	0.931	0.931	0.936	0.978	0.946	0.945

Table A16. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire STEM Score for AP Physics C: Mechanics and AP Statistics

STEM score		AP Physics C: Mechanics				AP Statisics			
		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	420	0.007	0.009	0.017	0.019	0.016	0.012	0.003	0.003
16	422	0.012	0.014	0.023	0.025	0.027	0.019	0.005	0.005
17	425	0.019	0.022	0.031	0.034	0.043	0.031	0.009	0.007
18	427	0.032	0.034	0.042	0.045	0.070	0.050	0.014	0.012
19	430	0.051	0.053	0.056	0.060	0.110	0.080	0.023	0.019
20	432	0.083	0.082	0.075	0.079	0.168	0.124	0.037	0.029
21	433	0.133	0.125	0.100	0.104	0.248	0.187	0.059	0.045
22	435	0.204	0.187	0.133	0.135	0.348	0.271	0.091	0.070
23	436	0.301	0.269	0.173	0.174	0.463	0.374	0.139	0.105
24	438	0.416	0.368	0.223	0.222	0.581	0.489	0.206	0.156
25	439	0.538	0.476	0.282	0.278	0.691	0.604	0.293	0.224
26	440	0.653	0.584	0.350	0.341	0.783	0.709	0.397	0.309
27	442	0.751	0.682	0.424	0.411	0.854	0.796	0.512	0.410
28	442	0.829	0.766	0.502	0.485	0.904	0.863	0.626	0.519
29	443	0.886	0.833	0.580	0.560	0.939	0.910	0.729	0.626
30	444	0.925	0.883	0.655	0.632	0.962	0.942	0.813	0.724
31	445	0.952	0.920	0.722	0.699	0.976	0.964	0.875	0.805
32	446	0.970	0.946	0.781	0.758	0.985	0.977	0.919	0.867
33	447	0.981	0.964	0.831	0.809	0.991	0.986	0.949	0.911
34	449	0.988	0.976	0.871	0.851	0.994	0.991	0.968	0.942
35	452	0.992	0.984	0.902	0.886	0.997	0.995	0.980	0.963
36	455	0.995	0.990	0.927	0.913	0.998	0.997	0.988	0.976

Table A17. Probabilities of AP Exam Success by PreACT/ACT or ACT Aspire Composite Score for AP Art History and AP Music Theory

Composite score		AP Art History				AP Music Theory			
		3 or higher		4 or higher		3 or higher		4 or higher	
PreACT/ ACT	ACT Aspire	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
15	422	0.134	0.134	0.036	0.036	0.119	0.116	0.047	0.028
16	424	0.167	0.167	0.046	0.046	0.154	0.147	0.061	0.037
17	426	0.206	0.206	0.059	0.059	0.198	0.185	0.079	0.049
18	428	0.252	0.252	0.075	0.075	0.251	0.231	0.102	0.065
19	430	0.305	0.305	0.096	0.096	0.314	0.285	0.132	0.085
20	432	0.363	0.363	0.122	0.122	0.385	0.347	0.170	0.111
21	433	0.425	0.425	0.155	0.155	0.462	0.414	0.216	0.145
22	435	0.489	0.489	0.194	0.194	0.542	0.486	0.272	0.188
23	436	0.554	0.554	0.241	0.241	0.619	0.559	0.337	0.240
24	437	0.616	0.616	0.295	0.295	0.691	0.629	0.410	0.303
25	438	0.674	0.674	0.355	0.355	0.755	0.694	0.487	0.374
26	439	0.726	0.726	0.418	0.418	0.809	0.752	0.564	0.451
27	440	0.773	0.773	0.482	0.482	0.853	0.802	0.638	0.529
28	441	0.813	0.813	0.545	0.545	0.889	0.844	0.704	0.606
29	442	0.847	0.847	0.603	0.603	0.916	0.878	0.762	0.676
30	443	0.876	0.876	0.657	0.657	0.937	0.905	0.811	0.737
31	443	0.900	0.900	0.705	0.705	0.953	0.926	0.851	0.790
32	444	0.919	0.919	0.748	0.748	0.965	0.943	0.883	0.834
33	445	0.935	0.935	0.785	0.785	0.974	0.956	0.909	0.869
34	447	0.948	0.948	0.817	0.817	0.980	0.966	0.929	0.897
35	449	0.959	0.959	0.845	0.845	0.985	0.974	0.945	0.920
36	451	0.967	0.967	0.870	0.870	0.989	0.980	0.957	0.938

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