Understanding Racial/Ethnic Gaps in AP® Exam Performance

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Introduction

Racial gaps in educational achievement have long been evident on both standardized measures like the National Assessment for Educational Progress (NAEP) and non-standardized measures like grades in high school and college (Wayne & Schmidt, 1999). The most recent data from NAEP reveals that the average mathematics score for White fourth-grade students in 2022 was 29 points higher than their Black peers and 22 points higher than their Hispanic peers (U.S. Department of Education, 2022). These observed gaps persist through high school. Average NAEP mathematics scores for White twelfth-grade students in 2019 were 31 points higher than their Black peers and 21 points higher than their Hispanic peers (U.S. Department of Education, 2019a). Similar achievement gaps by race/ethnicity appear on the NAEP Reading assessments (U.S. Department of Education, 2019). Recent data on grades in college also reveal White students earn higher average first-year grades (3.12) than their Black (2.68) and Hispanic (2.84) peers attending one of 171 four-year colleges and universities included in the study (Marini et al., 2019).

Like other measures, student performance on AP® Exams also reveals gaps by race and ethnicity. Average scores (on the 1-5 AP scale) across all 2022 AP Exams, for example, are lower among Black (2.1) and Hispanic students (2.4) than among White students (3.0) and Asian students (3.4). Yet, in the analyses below, we find that racial/ethnic gaps in AP Exam scores in the ten most popular AP subjects are nearly fully explained by differences in prior academic experiences, with only minimal differences attributable to other student and school background data. Students who enter the AP Program with similar academic preparation in prior grades, earn similar AP Exam scores regardless of their racial/ethnic subgroup, gender, parental education level, eligibility for an AP exam fee reduction, or school context. These results can help inform how and where educators, policymakers, and the Advanced Placement Program should focus their efforts to eliminate these gaps in student performance.

Data and Methods

Our sample includes students who took an AP Exam in the 2022 AP administration, took a PSAT-related assessments and/or SAT®, and reported their gender, race/ethnicity, parental education, and high school GPA. For the ten most popular AP Exams, we calculate the raw gaps in the percentage of students scoring a 3 or higher on each AP subject by race/ethnicity (White, Black, and Hispanic) among students in our analytic sample. These ten most popular AP Exams capture two-thirds of all AP Exams taken in 2022. Table 1 shows the number of students in the analytic sample for each AP Exam analyzed.

In order to understand what explains the raw gaps in the percentage of students scoring a 3 or higher on AP Exams, we use multilevel regression modeling to calculate gaps that are adjusted for prior academic achievement measured by

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PSAT-related assessment scores and/or SAT scores and HSGPA controlling for grade in high school at time of AP Exam.[1] In our final regression model, we then add additional controls to these prior academic achievement measures, including gender, parental education, number of prior and concurrent AP Exams taken, eligibility for an AP exam fee reduction, and school context variables including high school challenge and average test scores for students in the high school.[2] We use model results to calculate predicted likelihood of earning a score of 3 or higher for students who have the same predictor values using the sample mean for all continuous variables and the reference group value for all categorical variables (i.e., female, non-first generation, no fee reduction, least disadvantaged quintile with exam taken in the typical year for a given subject, such as 11th grade for U.S. History).

Table 1: Analytic Sample Sizes by AP Course and Race/Ethnicity

	Black		Hispanic		White	
	Total N	Number 3+	Total N	Number 3+	Total N	Number 3+
Biology	5,880	2,745	15,656	8,576	54,537	42,847
Calculus AB	6,852	2,117	21,397	8,468	79,549	47,556
English Language	11,156	4,366	28,558	13,652	97,635	67,390
English Literature	13,913	8,251	38,058	26,181	106,538	95,731
US Gov't & Pol	8,860	2,894	28,126	10,885	83,855	49,864
Human Geography	2,011	834	5,793	2,803	16,227	11,484
Psychology	7,409	3,066	19,596	9,616	73,973	49,003
Statistics	5,501	1,907	16,220	6,974	67,611	44,824
US History	8,720	2,965	22,865	9,724	79,676	47,006
World History	3,377	1,559	9,098	4,833	24,179	17,981

[1] When students register for an assessment in the SAT Suite, they are asked to report their HSGPA in letter grades ranging from an F (below 65) to an A+ (97–100), which we converted to numerical grades for purpose of this analysis.

[2] Data on parental education is self-reported by students who indicate the highest level of education achieved for both parents and responses are then aggregated into either first-generation (i.e., no college degree) or non-first generation (i.e., associate degree or higher). Fee reduction status indicates whether a student is eligible for College Board's AP fee reduction. High school challenge is comprised of six indicators at the census tract level including college attendance, household structure, median family income, housing stability, education level, and crime, and then aggregated across census tracts at each high school and expressed in quintiles. For more information about these measures, see: https://secure-media.collegeboard.org/landscape/comprehensivedata-methodology-overview.pdf.

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Results

Black-White Gaps in AP Exam Scores

The size of Black-White gaps in AP Exam scores are eliminated or greatly reduced when we compare AP students in different racial/ethnic subgroups with the same test scores and HSGPAs. The orange bars in Figure 1 show that the raw differences between the percentage of White and Black students earning a score of 3 or higher range from 25 to 32 percentage points across the ten AP subjects in our sample (See the Appendix for specific values). The gray bars show the size of the gaps when taking into account prior academic achievement as measured by test scores and HSGPA, and the blue bars shows the size of the gaps when the full set of additional controls are included.

Figure 1: Black-White Gaps in AP Exam Scores, by Subject and Different Control Variables
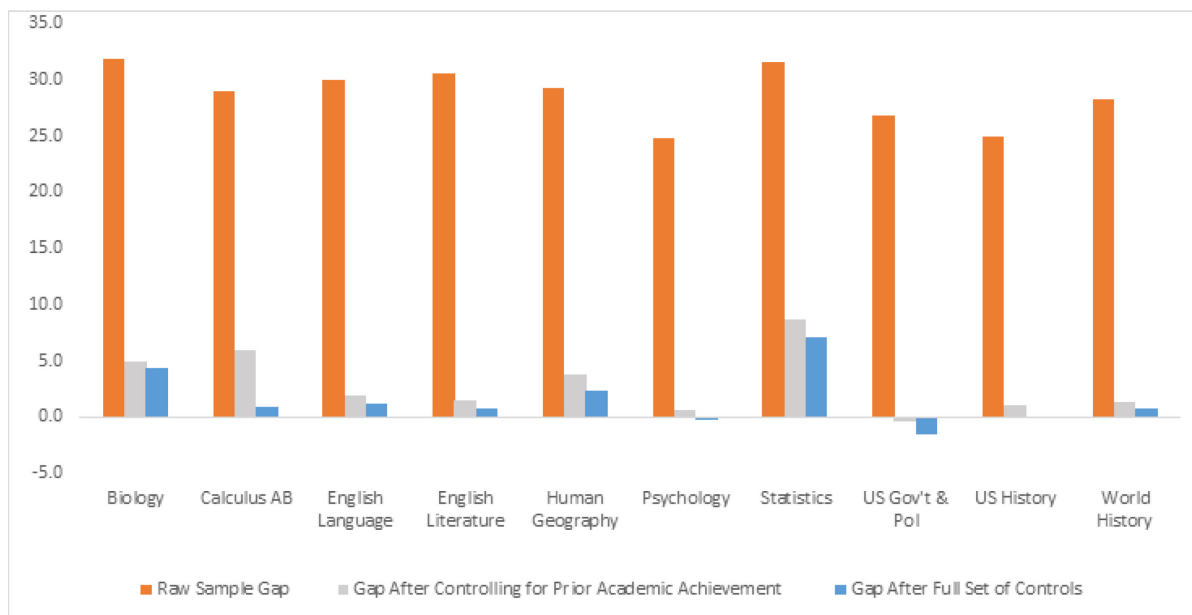

The results clearly demonstrate that the initial raw gaps in AP Exam scores shown in the orange bars of Figure 1 become non-existent or are greatly diminished once prior academic achievement is considered (gray bars). Gaps are only slightly further reduced once additional factors such as gender, parental education, fee waiver status, and high school attributes are considered (blue bars). For example, AP Psychology shows that although the proportion of Black students earning a 3 or higher on AP Psychology is 25 percentage points lower than the proportion of White students, this difference is explained by the different academic preparation of Black and White students received before taking AP Psychology. Once we take into account the full set of controls, the Black-White gap in AP Psychology performance is only slightly further changed, actually becoming negative (-0.2), suggesting Black students are slightly more likely to earn a 3 or higher on the AP Psychology Exam

than White students with the same prior achievement and other demographic characteristics.[3]

Hispanic-White Gaps in AP Exam Scores

Figure 2 shows the Hispanic-White gaps by different control variables. The orange bars in Figure 2 shows that the raw differences between the percentage of White and Hispanic students earning a score of 3 or higher range from 17 to 24 percentage points. These initial raw gaps in AP Exam scores again become non-existent or are greatly diminished once prior academic achievement is considered (gray bars). Gaps are only slightly further changed once the full set of controls are used (blue bars).

Figure 2: Hispanic-White Gaps in AP Exam Scores, by Subject and Different Control Variables
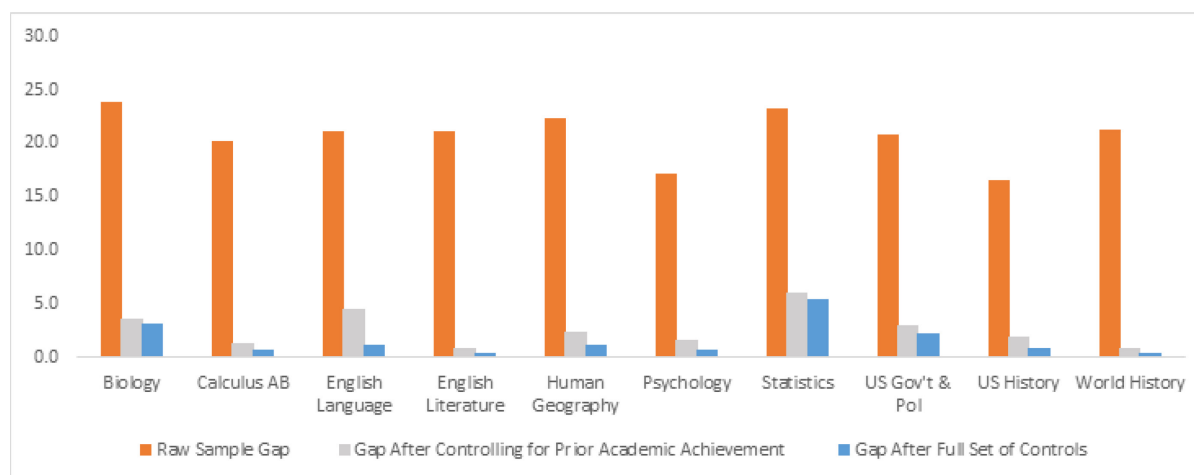
Summary

Across a broad range of high-volume AP Exams, we find that AP students from different racial/ethnic subgroups with the same prior test scores and HSGPAs are similarly likely to earn scores of 3 or higher on AP Exams. Differences in prior academic preparation explain most or all of the raw score gaps between racial/ethnic groups; once we control for student and school characteristics, we find only small additional changes in exam performance gaps. These findings foreground what many educators and researchers have already recognized: equitable academic resources and opportunities in earlier grades are critical to eliminating racial/ethnic performance gaps in advanced classes.

[3] We find similar results using the 2019 AP Exam administration, so analyses are not sensitive to pandemic factors.

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Appendix

Table A1: Size of Race Gaps in 2022 AP Exam Scores for Different Levels of Controls, Sample and Model-Based, All AP Subjects

	Black-White Gap				Hispanic-White Gap			
	Raw Population	Analytic Sample	Control P/SAT & HSGPA	All Controls	Raw Population	Analytic Sample	Control P/SAT & HSGPA	All Controls
Biology	37.5	31.9	4.9	4.4	29.9	23.8	3.6	3.2
Calculus AB	30.6	28.9	5.9	0.9	24.3	20.2	1.4	0.8
English Language	35.6	29.9	1.9	1.2	29.3	21.2	4.5	1.2
English Literature	36.8	30.6	1.5	0.8	26.8	21.1	0.9	0.4
US Gov't & Pol	29.5	26.8	-0.4	-1.6	24.9	20.8	3.0	2.2
Human Geo	33.9	29.3	3.8	2.4	30.1	22.4	2.4	1.2
Psychology	27.9	24.8	0.6	-0.2	21.3	17.1	1.7	0.8
Statistics	34.8	31.6	8.6	7.1	28.4	23.3	6.1	5.5
U.S. History	30.4	25.0	1.0	0.0	24.7	16.5	2.0	0.9
World History	32.2	28.2	1.4	0.8	28.9	21.3	0.9	0.5

Note: The raw population gaps are calculated based on all AP Exam takers who reported their race as Black, Hispanic, or White. The raw sample gaps and the model-based gaps with controls are based on a smaller subset of students who had non-missing values for all control variables.

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