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Leveling Up: A Behavioral Nudge to Increase Enrollment in Advanced Coursework

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Abstract

Taking advanced courses in high school predicts a broad array of positive postsecondary and labor market outcomes. Yet students from historically disadvantaged groups and low-income backgrounds have long been underrepresented in these courses. To address this problem, more than 60 districts in Washington state implemented a policy that automatically enrolled all qualified high school students in advanced coursework. The policy relied on a simple behavioral nudge: It made advanced courses "opt out" rather than "opt in" for all qualified students. The districts implemented the policy in waves, beginning in the 2014–15 school year. In this descriptive paper, we examine enrollment patterns by comparing districts that adopted the policy at different times. We found that students in districts that implemented the policy between 2014–15 and 2016–17 were more likely to enroll in at least one advanced course in any subject relative to students in districts without the policy. This was the case for students who "qualified" for advanced courses based on their test scores and for students whose scores did not qualify them for advanced courses. We also found that the policy was associated with a higher probability of enrollment in advanced mathematics courses but only for qualified students. Qualified students across demographic groups experienced similar changes in the probability of advanced course enrollments. But among all students—regardless of qualified status—enrollments in advanced mathematics and advanced English language arts/social studies courses increased more for students from racial/ethnic groups underrepresented in advanced courses and for students who were eligible for free or reduced-price lunch (FRPL) than for non-underrepresented students and students not eligible for FRPL. These across the board increases in advanced course enrollment for students who were historically underrepresented in these courses suggests that districts may have looked beyond standardized assessment scores to identify students for automatic enrollment.

1—Introduction

Multiple studies have found that taking Advanced Placement (AP), International Baccalaureate (IB), dual enrollment, or other college-preparatory courses is positively associated with a variety of student outcomes. These outcomes include both high school outcomes (e.g., test scores and the likelihood of graduation) and longer term outcomes in college (e.g., college matriculation and graduation, lower student loan debt, and higher long-term earnings; Adelman, 2006; An & Taylor, 2019; Austin, 2017, 2020; Evans, 2018; Jackson, 2014; Long et al., 2012). This literature finds substantial benefits from taking even one advanced course and especially large benefits from advanced course taking for students from historically disadvantaged racial/ethnic and socioeconomic backgrounds.[1]

At the same time, this literature highlights persistent and large racial/ethnic and socioeconomic gaps in enrollment in advanced courses. Multiple studies have found that Black and Hispanic students and students from low-income backgrounds are far less likely to enroll in advanced courses in high school than their peers (e.g., Austin, 2017; Card & Giuliano, 2014; Darity et al., 2001; McBee, 2016; Price, 2021). For instance, Klopfenstein (2004) found that Black and Hispanic students in Texas enrolled in AP courses at half the rate of White students (approximately 25% versus 50%). These gaps persisted even after accounting for students' prior academic achievement; they also existed among students who are likely college bound. A 2013 report by the College Board, for example, found that only 30% of Hispanic and Black students who exhibit strong potential to succeed in AP mathematics courses had attempted any such course compared with 40% of White students and 60% of Asian students.

Although some evidence suggests that advanced course taking among students from low-income backgrounds has increased since the early 2000s, recent studies continue to find large racial and

[1] Taking advanced courses and earning dual credit in high school also influences student decision making regarding college majors and career interests, suggesting the importance of these experiences as early inputs to future labor market decisions (Avery et al., 2018; Conger et al., 2021).

socioeconomic gaps in advanced course taking. Large proportions of qualified students from low-income backgrounds continue to be underenrolled in their school's advanced offerings (Card & Guiliano, 2016; Conger et al., 2009; Theokas & Saaris, 2013). Importantly, these gaps do not appear to be related to course availability. Studies have found that the supply of advanced courses offered by districts accounts for only a small portion of the demographic gaps in advanced course taking (Kolluri, 2018; Miller et al., 2018; Theokas & Saaris, 2013).[2]

In this paper, we examine a policy in Washington state designed to reduce barriers to enrollment in advanced coursework that disproportionately affect students from disadvantaged backgrounds (Stand for Children, 2019). The policy, called Academic Acceleration, requires schools to automatically enroll all high school students who meet the state standard on statewide assessments into the next highest level of coursework in the same or related subject(s). Rather than rely on recommendations from teachers, counselors, students, or their parents, the policy attempts to address gaps in advanced course enrollments by making the courses opt out rather than opt in for all qualified students.[3] Between 2010–11 and 2020–21, dozens of Washington districts adopted Academic Acceleration. Beginning in 2021–22, the state required all districts to adopt the policy. We describe the specifics of the policy in greater detail in Section 2 and compare the prepolicy characteristics and trends of adopting and nonadopting districts in Section 3.

Does automatic enrollment increase access to advanced courses for students who have historically been underrepresented in these courses?[4] To answer this question, we used state student-level administrative data that included demographic characteristics, test scores, and course enrollment

[2] The large within-district course-taking gaps also are a source of within-school segregation (Patrick et al., 2020; Xu et al., 2021).
[3] We elaborate on some of the mechanisms that could lead to disparate enrollment in advanced courses in Section 2.
[4] This study should not be interpreted as assessing the effects of the statewide mandate of the program because participation was not required by state policy until 2021–22.

history for all high school students in Washington public schools. Because different districts adopted the policy in different years, we implemented a difference-in-differences (DID) design to estimate descriptive outcomes for 72 districts that began implementing an Academic Acceleration policy in 2014–15 (45 districts), 2015–16 (12 districts), or 2016–17 (15 districts). We examined enrollment in advanced English language arts (ELA) and social studies courses and advanced mathematics courses, and we focus on three primary outcomes for each subject area: (a) the student-level probability of enrolling in at least one advanced course; (b) the student-level probability of enrolling in at least one advanced course for students who meet the qualification threshold; and (c) the student-level probability of enrolling in at least one advanced course for qualified students who are members of one of two groups: (a) students who are members of racial/ethnic groups that are historically underrepresented in advanced courses (hereafter, URM for underrepresented minority groups) and (b) students from low-income backgrounds, measured by their eligibility for free or reduced-price lunch (hereafter referred to as FRPL).

We found that students in districts that implemented the policy between 2014–15 and 2016–17 were more likely to enroll in at least one advanced course in any subject relative to students in districts that implemented the policy later. This was the case for students who "qualified" for advanced coursework (i.e., they scored proficient or higher on their state standardized ELA or mathematics assessment) as well as for students whose scores did not qualify them for advanced courses. We also found that policy implementation was associated with a higher probability of enrollment in advanced mathematics courses for "qualified" students (those who scored proficient or higher on their state standardized mathematics assessment). Contrary to the policy's equity goals, we found that qualified students who were not members of the URM group or the FRPL group were more likely to enroll in advanced mathematics courses after policy implementation than qualified URM or FRPL-eligible students. However, some evidence also suggests that advance course enrollments increased in implementing districts for all URM and FRPL-eligible students (regardless of qualified status) more than they did for all non-URM and non-FRPL-eligible students. These findings suggest that changing the default may both induce some qualified students to enroll in advanced courses who would not otherwise have enrolled and increase equitable advanced course enrollment in multiple subject areas.

The paper proceeds as follows. Section 2 provides additional context on Academic Acceleration and summarizes prior research on behavioral-based policy interventions. Section 3 describes the data we used to test our hypotheses and explores prepolicy gaps in enrollment. Section 4 outlines our empirical approach. Section 5 presents the results, and Section 6 discusses the results and presents some concluding thoughts.

2—Academic Acceleration: Background, Theory, and Washington Context

2.1—Background and Theory

Academic Acceleration policies aim to increase enrollment in advanced courses by automatically enrolling all qualified students, especially in high school (Dougherty et al., 2015, 2017; McEachin et al., 2020). These policies make advanced coursework the default pathway for all qualified students (while allowing students to opt out if desired). Default options have been shown to have important implications for choice and outcomes in a variety of contexts. Different default choices have, for example, been shown to change organ donation rates, savings participation, and the nutritional value of food purchases (Benartzi & Thaler, 2007; Johnson & Goldstein, 2003; Thaler & Benartzi, 2004; Thorndike et al., 2012). In education, Card and Giuliano (2016) found that implementing universal screening for a gifted program led to a significant increase in the representation of students from URM and FRPL groups in gifted classes.

Academic Acceleration and similar automatic enrollment policies aim to address multiple barriers to advanced course participation that can exclude qualified students and disproportionately affect students from historically URM groups. Often, decisions about which students should take advanced high school courses are based on factors such as teacher or counselor recommendations, prior gifted status, or student and parent self-selection. Implicit or explicit biases among teachers or counselors could influence which students are recommended for or encouraged to take advanced courses (Anderson, 2022; Card & Giuliano, 2014, 2016; Lewis & Diamond, 2015; McBee, 2016). Students and parents from disadvantaged backgrounds also may lack information on the availability of advanced courses or the benefits of taking such courses, making it harder for them to advocate for their children to access these courses (Ferguson, 2007; Hornby & Lafaele, 2011; Smith, 2008; Walker 2007). Beyond missed opportunities, persistent demographic disparities in advanced course enrollment mean that many students from disadvantaged backgrounds do not see similar-background peers in these courses, which could reinforce beliefs that they do not belong, are not qualified for, or cannot succeed in advanced courses (Campbell-Cunefare, 2020; Keller, 2008; Sweeney, 2016).

Compared with efforts to increase enrollment through targeted teacher training, learning supports, and/or advising, such as the AP Training and Incentive Program (Sherman et al., 2017) or Action For Equity (Equal Opportunity Schools, 2022), Academic Acceleration policies are light touch and low cost. Our study is among the first to produce estimates of their effects (Dougherty et al., 2015, 2017; McEachin et al., 2020) and contributes to the growing body of behavioral economics research on choice architecture and the power of changing defaults, as well as literature on policies designed to advance equitable opportunities to learn.

2.2—Washington Context

Academic Acceleration was first implemented in 2010–11 by Federal Way Public Schools, an urban district serving about 20,000 students south of Seattle, Washington. Two years after Academic Acceleration was implemented in Federal Way, the Washington state legislature passed a law that encouraged all districts to adopt the policy and provided model language for them to do so. Between 2013–14 and 2015–16, an additional 72 of Washington's 263 districts that have at least one high school adopted the policy.[5] In 2019, the state legislature updated the policy and mandated that all remaining districts adopt Academic Acceleration by the 2021–22 school year.[6] See Section A1 in the appendix for the original policy language from 2013 and Section A2 in the appendix for the updated policy language from 2019.

We examined the implications of Academic Acceleration by comparing the course-taking outcomes of students in districts that were early adopters of the program—72 districts that adopted the policy between 2013–14 and 2015–16 and began implementing between 2014–15 and 2016–17—with outcomes of students in districts that did not implement early.

The 2013 policy language stated that students were deemed eligible for automatic enrollment in an advanced course in a subject if they met the state standard on the relevant statewide high school assessment(s) for that subject. Students who met the standard on both the reading and writing assessments were eligible for automatic enrollment into advanced ELA and/or social studies courses. Students who met the standard on the Algebra I and Geometry end-of-course assessments were eligible for automatic enrollment into advanced mathematics courses. (The revised 2019 law expanded automatic enrollment to also include advanced science courses for students who met the standard on the state science assessment.) To meet the state standard, students had to achieve scale scores that represented either Level 3 or Level 4 achievement.[7] The minimum scale score for meeting the state standard (and

[5] To our knowledge, policy adoption decisions were made by the board of directors in each district.
[6] The 2019 policy update also allowed for students to qualify for automatic enrollment in advanced courses based on either their eighth grade or their high school assessments, rather than only their high school assessments as in the 2013 version.
[7] High school students who achieve a Level 3 (Level 4) score on statewide assessments meet (exceed) state expectations for college-level knowledge and skills, indicating students are on track to engage in college level courses without remediation.

thus qualifying for automatic enrollment) is slightly higher than the minimum scale score for meeting state graduation requirements.

Students typically took the reading and writing assessments in 10th or 11th grade, so qualifying students would have been automatically enrolled in advanced ELA and/or social studies courses beginning in 11th or 12th grade.[8] Similarly, most students took the mathematics assessments in 10th or 11th grade, so qualifying students would have been automatically enrolled in advanced mathematics courses beginning in 11th or 12th grade.[9] We included all enrolled students in Grades 11 and 12 in our analysis and identified as qualified all students who took the reading/writing and mathematics assessment(s) and earned a score that classified them as meeting the standards. All students who took an assessment(s) but did not earn a score that met standards or who had not yet taken the assessment(s) are classified as not qualified. In 2018–19, 66% of all 11th- and 12th-grade students met the state standard in ELA and 40% met the state standard in mathematics. These are the students who qualified for automatic enrollment under Academic Acceleration.

3—Data

3.1—Overview of Sample

We used administrative, individual-level data from the Washington Office of Superintendent of Public Instruction that included all 11th- and 12th-grade students in Washington public schools from 2010–11 through 2018–19. We used these data to identify students' demographic characteristics (gender, race/ethnicity, FRPL eligibility, whether students have an individualized education program, and

[8] Prior to 2014–15, Washington required students to take the High School Proficiency Examinations for reading and writing in 10th grade. In 2014–15, the state transitioned to having students take the Smarter Balanced Assessment (SBA) in ELA. From 2014–15 to 2016–17, students took the ELA SBA in 11th grade; beginning in 2017–18, students took the ELA SBA starting in 10th grade.

[9] Prior to 2014–15, Washington required students to take two end-of-course (EOC) examinations for algebra and geometry upon completion of the corresponding courses, typically between ninth and 11th grade. In 2014–15, the state transitioned to having students take the SBA in mathematics. From 2014–15 to 2016–17, students took the mathematics SBA in 11th grade; beginning in 2018, students took the mathematics SBA starting in 10th grade. Students still had the opportunity to take one or both EOC examinations through 2017–18.

whether students speak English as their primary language); scale scores on all standardized assessments in mathematics and reading; and course enrollment history for each student. Although reliable data on student demographic characteristics and test scores were available before 2010–11, course enrollment data were available starting only in 2010–11 (Washington Education Research and Data Center, 2020).

Of the 295 districts in Washington, 263 have at least one high school. From this sample, we excluded two early implementing districts that adopted the policy before the statewide guidance was available and 15 districts that began implementing in 2017–18 or 2018–19; these late implementers did not have sufficient postpolicy data to examine treatment outcomes and were not suitable comparison districts because they eventually implemented the policy. Two implementing districts that did not have any high school enrollment preimplementation also were excluded, as were four comparison districts that did not have any high school enrollment prior to 2015.[10]

The remaining 240 districts (91% of the 263 districts with a high school) constitute the overall sample from which we generated our matched analytic sample. This includes the 72 districts in our three implementation cohorts from 2014–15 through 2016–17 and 168 comparison districts that did not adopt Academic Acceleration before the legislative update that made policy adoption mandatory by 2022. We define prepolicy as the time period(s) before policy implementation; we define postpolicy as the time period(s) for each district beginning with the first full academic year following the date on which the district adopted its policy. For example, if a district adopted an Academic Acceleration policy on January 31, 2014, we defined 2013–14 as the district's last prepolicy year and 2014–15 as the district's first policy implementation year; this district would be part of the 2015 implementation cohort.

[10] Six treatment districts did not have any preimplementation advanced course enrollment (students in these districts constitute less than 0.5% of the treated sample). Seven control districts did not have any advanced course enrollment in the relevant comparison years. The results were nearly identical when excluding these districts.

3.2—Overview of Analytic Sample

Table 1 shows prepolicy demographic characteristics, course enrollments, and average percentages of students who met the proficiency standard on state standardized assessments for the study sample, by policy adoption status. All statistics, except average enrollment, are weighted at the individual student level and aggregated across the years before policy implementation shared by all three cohorts: 2010–11 through 2013–14. For the 240 districts in the sample serving Grades 11 and 12 between 2010–11 and 2013–14, there were 561,528 student-year observations for these students across five cohorts (class of 2011 through class of 2015). On average, there were 587 students in Grades 11 and 12 per district, indicating that the average district had approximately 300 students per graduating class. Overall, 28.6% of the students were students from URM groups (defined as students who identified as Black, Hispanic or Latino, Native American/Alaska Native, Native Hawaiian/Pacific Islander, or two or more races because these groups have historically been underenrolled in advanced courses in Washington state relative to their share of the student population). In addition, 40% of the students in the overall sample were eligible for FRPL, our proxy for living in a low-income household.

The average student was enrolled in 0.67 advanced courses across all subjects before the policy. Approximately 24% of all students were enrolled in at least one advanced ELA or social studies course, and 13% of all students were enrolled in at least one advanced mathematics course. These percentages were lower for students from the URM and FRPL groups. Among students from the URM groups, approximately 18% were enrolled in at least one advanced ELA or social studies course, and 7% were enrolled in at least one advanced mathematics course. Among students eligible for FRPL, 15% were enrolled in at least one advanced ELA or social studies course, and 6% were enrolled in at least one advanced mathematics course. The percentage of students meeting standards in ELA and mathematics was lower among URM students (61% were proficient in ELA and 35% in mathematics) and students who were eligible for FRPL (61% were proficient in ELA and 36% in mathematics) compared with all students (72% were proficient in ELA and 46% in mathematics).[11]

Columns 1 and 2 in Table 2 show the pre-implementation percentages of students taking advanced courses in comparison and early adopting districts across multiple student characteristics, including qualification for Academic Acceleration, had it been in place. All values are estimated for students in early-adopting districts and comparison districts across the years before policy implementation and the years following policy implementation. Although there are differences in advanced course taking rates between comparison and early adopting districts, the average standardized mean differences between samples (i.e., all pre-implementation years together) were all less than 0.25 (What Works Clearinghouse, 2020).

3.3—Prepolicy Gaps in Advanced Course Enrollment

Table 2 also presents the shares of students who enrolled in at least one advanced course before and after policy implementation, broken out by qualified status (whether they achieved a score of proficient or higher on the relevant state standardized assessment) and key demographic characteristics (URM and FRPL eligible). Before policy adoption, substantial gaps existed in advanced course enrollment between qualified students by URM and FRPL status.

Overall, 31.5% of the students in early adopting districts and 39.9% of the students in comparison districts took an advanced course in any subject before policy implementation. Before policy

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[11] Proficiency in ELA was measured using students' reading and writing scores on the High School Proficiency Examination from 2010–11 through 2013–14, which was typically taken in 10th grade, and on the ELA SBA from 2014–15 onward, which was typically taken in 11th grade from 2014–15 through 2016–17 and then in 10th grade from 2017–18 onward. From 2010–11 through 2013–14, proficiency in mathematics was measured using students' scores on either the algebra EOC examination, which was typically taken after completing the Algebra I course (usually in ninth or 10th grade) or the geometry EOC examination, which was typically taken after completing the geometry course (usually in 10th or 11th grade). In 2014–15, the state transitioned to having students take the SBA in mathematics. From 2014–15 to 2016–17, students took the mathematics SBA in 11th grade; beginning in 2018, students took the mathematics SBA starting in 10th grade. Students still had the opportunity to take one or both EOC examinations through 2017–18. Each examination designated a proficiency threshold, and we used those thresholds to identify qualified students in each grade and year.

implementation, 20.8% of all 11th- and 12th-grade students in early adopting districts and 26.0% in comparison districts enrolled in an advanced ELA or social studies course. Fewer students enrolled in an advanced mathematics course: 9.1% of 11th- and 12th-grade students in early adopting districts and 14.0% of 11th- and 12th-grade students in comparison districts enrolled in an advanced mathematics course before policy implementation. Columns 3 and 6 present standardized mean differences between early adopting and comparison districts; these differences all are smaller than 0.25.

The share of students enrolled in an advanced course was substantially higher for qualified students (those who scored proficient or higher on the relevant standardized assessment) than for unqualified students (those who scored below proficient). In early adopting and comparison districts, respectively, qualified students were 15.8 and 16.4 percentage points more likely to enroll in an advanced ELA or social studies course (the differences between 20.7% and 4.9% and 23.4% and 7.0%, respectively). Qualified students also were 6.2 and 7.3 percentage points more likely to enroll in an advanced mathematics course and 31.8 and 36.7 percentage points more likely to enroll in any advanced course. This aligns with what we would expect, given that qualified students are more likely to be recommended for and/or self-select into advanced coursework. These gaps did not change much in ELA/social studies or any advanced course after policy implementation. But in mathematics, the gaps increased to 18.7 percentage points for early adopting districts and 20.5 percentage points in comparison districts.

Among qualified students, the prepolicy gaps between students by URM and FRPL status were sizable. Compared with qualified White and Asian students, qualified URM students enrolled in advanced courses at lower rates. The prepolicy gaps were smaller for students in early-adopting districts, but overall enrollments in those districts also were lower. In comparison districts, overall prepolicy enrollments were higher and gaps were larger. For example, the preimplementation gap in advanced mathematics enrollment was 4.3 percentage points in early-adopting districts (a 9.4% participation rate for students from URM groups and a 13.7% participation rate for White and Asian students). In contrast, the gap was 5.9 percentage points in comparison districts. Gaps by eligibility for FRPL followed similar patterns but were larger. The relative magnitude and direction of these gaps is largely consistent with those previously identified in the literature.

After policy implementation, enrollments in early adopting districts increased for all students, in most cases narrowing gaps by URM and FRPL status. In comparison districts, demographic gaps in ELA/social studies and advanced course participation more generally also narrowed. In advanced mathematics, participation increased for all students in comparison districts, but so did the demographic gaps in participation.

4—Difference-in-Differences Design

If Academic Acceleration worked as intended, we would expect advanced course enrollment to increase for qualified students by a greater margin in districts that adopted the policy than in districts that did not adopt the policy. Moreover, we would expect this change to be especially pronounced for students from URM and FRPL groups who have been historically underrepresented in advanced courses. Our empirical strategy formalized this intuition by employing a DID model that compared changes in course enrollment in policy-implementing districts to changes in course enrollment in comparison districts.

We estimated separate models for the probability of enrollment in advanced ELA or social studies courses, advanced mathematics courses, and any advanced course regardless of subject area (including science; foreign language; arts; and other subjects beyond ELA, social studies, and mathematics).[12] Based on the 2013 policy language, students who met the reading and writing standards would have been eligible for automatic enrollment into advanced courses in ELA/social studies; students who met the mathematics standards would have been eligible for automatic enrollment into advanced courses in mathematics. (In 2019, the policy expanded to include automatic enrollment into science.) We examined enrollments in either advanced ELA or social studies courses and in advanced mathematics courses to understand which types of courses experienced enrollment changes. We define advanced courses to include those designated as AP, IB, Cambridge International, Running Start (a dual enrollment program that enables students to take college courses at Washington community colleges), or College in the High School (a dual credit program in Washington that enables students to earn college credit by passing the course). We focused on these courses primarily because Academic Acceleration was explicitly intended to promote enrollment in dual credit coursework and secondarily to accommodate methodological considerations.[13]

We estimated the association between policy implementation and the student-level probability of enrolling in at least one advanced course in each subject or subject group. We extended these analyses to estimate differential outcomes for qualified students and students in the URM and FRPL groups. We used linear probability models to estimate impacts on the probability of enrollment. For all models, we implemented two-way fixed effects and cluster standard errors at the district level, which is the level of policy variation.

[12] We also examined enrollment outcomes for ELA only and for mathematics and science combined. ELA outcomes were consistent with ELA/social studies outcomes, and we did not observe increases in science enrollment, which is consistent with the original policy focus on mathematics. These results are available on request.

[13] For example, we excluded honors courses because although automatically enrolling into honors courses may help prepare students for dual credit courses later in high school, the Academic Acceleration policy may have induced movement both into honors (from standard-level courses) and out of honors (into AP and/or IB courses), which would make it difficult to interpret the results. The Academic Acceleration policy language did not list specific types of courses, but it does state that a primary goal is to increase the number of students who enroll in dual credit advanced courses.

4.1—Assumption of Parallel Trends

A DID design identifies plausibly causal effects under the assumption that, in the absence of Academic Acceleration, advanced course enrollment patterns in early policy-adopting districts would have followed the same trend as in the comparison districts. We examined the plausibility of this assumption by plotting prepolicy trends in the percentage of students who enroll in advanced courses.

Figure 1 plots the percentage of students who enrolled in advanced courses in each year from 2011 through 2019. Subplots within these figures show the trends for each implementation cohort separately. The panel on the left illustrates the likelihood of enrolling in at least one advanced ELA or social studies course. The prepolicy implementation trends do not pass the parallel assumptions test for the 2015 and 2016 cohorts. That is, there is an upward trend in the rate of advanced course taking in treatment districts before implementation that did not exist in the comparison districts. The formal test of this violation (De Chaisemartin & d'Haultfoeuille, 2020) rejects the null hypothesis of parallel trends ($p = 0.03$).[14] A similar violation of parallel trends was evident when examining any advanced course taking (right panel). Because the assumption of parallel trends was violated, it is not reasonable to estimate two-way fixed effects models and attribute the *Post * Treatment* interaction term to the automatic enrollment policy. As a result, we emphasize that the results presented should be viewed as descriptive, not causal.

4.2—Model Specifications

We began by estimating the association between policy implementation and the student-level probability of enrolling in at least one advanced course for all three subject areas: ELA and social studies, mathematics, and any subject. We estimated models that conducted estimates separately for all

[14] We also attempted to address the violation using propensity score matching to match treatment districts to observationally similar comparison districts. However, restricting the comparison sample in this manner continued to result in parallel trends violations.

three early implementation cohorts (2014–15, 2015–16, and 2016–17) as well as all cohorts pooled together[15] using the following DID model:

Model 1: $Y_{idt} = \gamma_d + \lambda_t + \delta Policy_{dt} + \theta \boldsymbol{X_{idt}} + u_{idt}$

where Y_{idt} is a binary indicator equal to 1 if student *i* in district *d* in year *t* enrolled in an advanced course in the relevant subject. γ_d and λ_t are district and year fixed effects and $Policy_{dt}$ is an indicator that equals one for policy-adopting districts in the postpolicy period and zero otherwise. $\boldsymbol{X_{idt}}$ is a vector of student characteristics, including URM status, FRPL status, special education status, gender, whether the student spoke English as a primary language, and whether the student met standards as of the prior year in the relevant subject area (an indicator of qualified status). Standard errors are clustered at the district level. Our coefficient of interest is δ, which represents the change in the student-level probability of enrolling in at least one advanced course in the relevant subject area for students in policy-implementing districts, relative to the change in probability for students in comparison districts. For instance, a positive and significant δ would indicate that advanced course enrollment increased more in policy-implementing districts than in comparison districts.

Next, we added interaction terms to Model 1 to estimate differential enrollment changes between different student groups. Because the policy calls for automatic enrollment of only qualified students (those who met the state standard on statewide assessments), we began by comparing outcomes between qualified and unqualified students. Model 2a shows this most basic specification:

Model 2a: $Y_{idt} = \gamma_d + \lambda_t + \delta_1 Policy_{dt} + \delta_2 Qualified_{idt} + \delta_3 Policy_{dt} * Qualified_{idt} + \theta \boldsymbol{X_{idt}} + u_{idt}$

[15] We also estimated results separately for 11th- and 12th-grade students and found that the results did not substantially differ between grades. We present the combined results for simplicity.

where Y_{idt} and $Policy_{dt}$ are as described previously and $Qualified_{idt}$ is a dummy variable for whether student i met the state standard in the relevant subject area as of the prior academic year.[16] The coefficient of interest is δ_3, which represents the change in outcome for qualified students, relative to unqualified students. A positive and significant δ_3 would indicate that enrollment increased among qualified students by a greater degree than among unqualified students in policy-implementing districts.

Because we expected the policy to have a differential impact for students who are members of our focal demographic groups, we also estimated three-way interactions to test whether enrollment changes differed for students who are members of a URM group and who are eligible for FRPL, relative to students who do not have these characteristics. We did so by including three-way interaction terms for each demographic characteristic, as shown by Models 2b and 2c. Both models include all lower interaction terms, but these have been omitted for conciseness:

Model 2b: $Y_{idt} = \gamma_d + \lambda_t + \delta_1 Policy_{dt} + \delta_2 Qualified_{idt} + \delta_4 Policy_{dt} * Qualified_{idt} + \delta_5 Policy_{dt} * URM_{idt} + \delta_6 Policy_{dt} * Qualified_{idt} * URM_{idt} + \theta \boldsymbol{X_{idt}} + u_{idt}$

Model 2c: $Y_{idt} = \gamma_d + \lambda_t + \delta_1 Policy_{dt} + \delta_2 Qualified_{idt} + \delta_4 Policy_{dt} * Qualified_{idt} + \delta_5 Policy_{dt} * FRL_{idt} + \delta_6 Policy_{dt} * Qualified_{idt} * FRL_{idt} + \theta \boldsymbol{X_{idt}} + u_{idt}$

where Y_{idt}, $Policy_{dt}$, and $Qualified_{idt}$ are as described previously and URM_{idt} and FRL_{idt} are indicators for whether student i is from a URM and/or FRPL group, respectively. In both models, the coefficients of interest are those on the highest level interaction terms: δ_6. In Model 2b, δ_6 represents the change in outcome for qualified URM students, relative to qualified non-URM students. In Model 2c, δ_6 represents the change in outcome for qualified FRPL-eligible students, relative to qualified non-FRPL-

[16] When estimating the impact of the policy on advanced course enrollment in ELA/social studies, *Qualified* equals 1 for students who met standards in ELA. When estimating the impact of the policy on advanced course enrollment in mathematics, *Qualified* equals 1 for students who met standards in mathematics. When estimating the impact of the policy on advanced course enrollment in any subject, *Qualified* equals 1 for students who met standards in ELA or mathematics.

eligible students. In all model specifications, the omitted category is unqualified, non-URM, non-FRPL-eligible students.

5—Results

5.1—Changes in the Probability of Enrollment in Advanced Courses for All Students

We began by exploring whether Academic Acceleration was associated with an overall increase in the probability of enrolling in an advanced course. Specifically, we estimated the association between policy implementation and the student-level probability of enrolling in an advanced course in each subject area: ELA or social studies, mathematics, and any advanced course (see Section A3 in the appendix for examples of courses in each subject area). Although we present the coefficients for *Policy* in Table 3*,* our primary coefficients of interest are for the interaction between *Policy* and *Qualified* in Table 4. As the policy was written, only students whose relevant standardized assessment scores met the threshold for proficiency or higher were identified for automatic enrollment. So we would expect policy implementation to be associated with enrollment increases for these qualified students but not necessarily for unqualified students, especially in the policy's early years.[17]

Table 3 presents the increase in the probability of enrolling in at least one advanced course in each subject area for students in policy-implementing districts compared with students in nonimplementing districts, regardless of qualified status. If the policy succeeded in enrolling more students in advanced courses regardless of students' qualification status, then we would expect the coefficients on $Policy$ to be significant and positive. This is the case for enrollment in an advanced course in any subject: The results show that, on average, across cohorts, policy implementation was associated with a 5.3 percentage point increase in any advanced course enrollment. Coefficients are

[17] The policy also could lead to increased enrollment among unqualified students if these students feel motivated by an overall policy-induced surge in advanced course taking among qualified students who are demographically or otherwise similar to themselves, or if the policy motivated broader changes in school culture that encouraged more universal participation. However, we would expect these cultural changes to take some time to emerge.

positive for all three individual cohorts and significant for the 2015 and 2016 cohorts (7.3 and 5.0 percentage points, respectively). This is generally not the case for advanced courses in ELA/social studies or mathematics, either overall or for most cohorts individually, which showed no difference from before to after policy implementation. However, there was a significant positive association between policy implementation and increased advanced course enrollment in ELA/social studies for the 2016 cohort (2.7 percentage points) and in mathematics for the 2017 cohort (3.4 percentage points).

5.2—Changes in the Probability of Advanced Course Enrollment for Qualified Students

Although overall enrollment changes are a useful starting point, we expected the policy to have the greatest impact on qualified students. Table 4 presents the results for the interaction between *Policy* and *Qualified*, by subject area. If the policy worked as intended, we would expect to see significant coefficients for the interaction term, indicating that qualified students experienced a larger increase in the probability of advanced course enrollment than nonqualified students following policy implementation. This was not the case for ELA/social studies courses or any advanced course enrollment, except for the 2017 cohort. For the 2017 cohort, policy implementation was associated with an increase in the probability of any advanced course enrollment for qualified students, which was 5.1 percentage points larger than for nonqualified students. The results for mathematics enrollment align more closely to what we would expect to see if the policy operated as intended: Policy implementation was associated with a larger increase in the probability of taking an advanced mathematics course for qualified students than for nonqualified students, on average, across cohorts (4.8 percentage points), in the 2015 cohort (10.9 percentage points), and in the 2017 cohort (3.0 percentage points).

5.3—Demographic Changes in the Probability of Advanced Course Enrollment

Because qualified students from URM and FRPL groups are less likely to enroll in advanced courses in the absence of automatic enrollment, Academic Acceleration is a potential mechanism for increasing equitable enrollment in advanced courses for these students. We examined differential impacts of the policy using three-way interactions for *Policy * Qualified * URM* and *Policy * Qualified * FRPL.* To aid in the interpretation of these complex interactions, we calculated marginal effects and graphed the resulting predicted probabilities of enrolling in an advanced course by subject area. Coefficients for all interaction terms are presented in Tables 5 and 6. Figures 2 and 3 present predicted probabilities for the pooled sample of students from all three early implementing cohorts.

5.3a—Changes in the Probability of Advanced Course Enrollment by URM Status

Across subject areas and cohorts, qualified URM students were less likely than qualified non-URM students to enroll in advanced courses (Table 5). The interaction coefficients for *Policy * Qualified * URM* in Table 5 indicate that qualified URM and non-URM students in policy-implementing districts experienced similar changes in their probabilities of advanced course enrollment. The exception is enrollment in advanced mathematics for the 2017 cohort. For mathematics, qualified URM students in policy-implementing districts experienced a 7.4 percentage point smaller increase in the probability of enrolling in an advanced mathematics course than qualified non-URM students in these districts.

However, the *Policy * URM* interaction coefficients in Table 5 indicate that policy implementation was associated with significantly larger positive enrollment increases for URM than non-URM students in advanced ELA/social studies and advanced mathematics courses, regardless of qualified status. Across cohorts, policy implementation was associated with a 3.1 percentage point larger increase in advanced mathematics course enrollment and a 2 percentage point larger increase in advanced ELA/social studies course enrollment for URM students compared with non-URM students. The larger increase in advanced mathematics course enrollment for URM students also was significant in each cohort and ranged from 2.4 to 5 percentage points. The larger increase in ELA course enrollment for URM students also was significant, but only for students in the 2017 cohort, who experienced a 4.7 percentage point larger increase.

Figure 2 illustrates how qualified students' probability of enrolling in advanced courses changed from pre- to postpolicy by URM status, based on the results reported in Table 5. Enrollment gaps by URM status narrowed 86% in advanced ELA/social studies, 43% for any advanced course, and 35% in advanced mathematics.

5.3b—Changes in the Probability of Advanced Course Enrollment by FRPL Status

Similar to qualified URM students, qualified FRPL-eligible students were less likely than qualified non-FRPL-eligible students to enroll in advanced courses across subjects (Table 6). The interaction coefficients for *Policy * Qualified * URM* in Table 6 also indicate that qualified FRPL- and non-FRPL-eligible students in policy-implementing districts experienced similar changes in their probabilities of any advanced course enrollment. Qualified FRPL-eligible students in policy-implementing districts experienced a smaller increase in the probability of enrollment in advanced mathematics courses than qualified non-FRPL-eligible students, on average, across cohorts (a 2.9 percentage point disadvantage) and for the 2017 cohort (a 6.5 percentage point disadvantage). In contrast, qualified FRPL-eligible students in policy-implementing districts had a 2.0 percentage point larger probability of enrolling in advanced ELA/social studies courses than qualified non-FRPL-eligible students; coefficients were significant and positive for the 2016 and 2017 cohorts as well (2.2. and 4.1 percentage points, respectively).

Also similar to the URM findings, the *Policy * FRPL* coefficients in Table 6 indicate that policy implementation was associated with a significant positive increase in enrollment in advanced ELA/social studies and advanced mathematics courses for FRPL-eligible students regardless of qualified status. Across cohorts, policy implementation was associated with a 3.8 percentage point larger increase in advanced mathematics course enrollment and a 2 percentage point larger increase in advanced ELA/social studies course enrollment for all FRPL-eligible students than for all non-FRPL-eligible students. The larger increase in advanced mathematics course enrollment for all FRPL-eligible students also was significant in each cohort and ranged from 3.1 to 4.8 percentage points. The larger increase in ELA course enrollment for FRPL-eligible students also was significant for students in the 2016 and 2017 cohorts, who experienced a 2.2 and a 4.1 percentage point larger increase, respectively.

Figure 3 illustrates how qualified students' probability of enrolling in advanced courses changed from pre- to postpolicy by FRPL status, based on the results reported Table 6. Gaps by FRPL status were larger prepolicy and narrowed less postpolicy—by 42% for advanced ELA/social studies, 28% for any advanced course, and 11% for advanced mathematics.

6—Discussion and Conclusions

Beginning in 2013–14, the Washington state legislature encouraged districts to adopt Academic Acceleration policies that would automatically enroll all high school students with a qualifying standardized test score into advanced courses in high school. By automatically enrolling qualified students, these policies attempted to bypass long-standing barriers to advanced course participation (e.g., reliance on teacher or counselor recommendations or student or parent self-identification). These barriers tend to disproportionately affect students who are historically disadvantaged, who are then underrepresented in advanced courses, resulting in racial and socioeconomic gaps in advanced course taking. Our results showed that these policies were associated with a 5.3 percentage point increase in the probability of enrollment in any advanced course for all students, regardless of qualified status, and a 4.8 percentage point increase in the probability of advanced mathematics courses enrollment for qualified students. The policies also were associated with a 5.1 percentage point increase in qualified students' chances of taking an advanced course in any subject in the 2017 cohort.

With regard to racial and socioeconomic gaps in advanced course participation, our results indicated that, in most cases, Academic Acceleration policies were associated with a similar change in the odds of advanced course enrollment for qualified URM or FRPL-eligible students and qualified non-URM or non-FRPL-eligible students. For qualified FRPL-eligible students, policy implementation was associated with a 2 percentage point larger increase in the probability of enrolling in advanced ELA or social studies courses than for qualified non-FRPL-eligible students. In contrast, policy implementation was associated with a 2.9 percentage point larger increase in advanced mathematics course enrollment for qualified non-FRPL-eligible students than for qualified FRPL-eligible students across cohorts. In the 2017 cohort, qualified non-URM and non-FRPL-eligible students in policy-implementing districts experienced 7.4 and 6.5 percentage point larger increases in the probability of taking advanced courses, respectively, than qualified URM and FRPL-eligible students. This increased, rather than decreased, demographic gaps in advanced mathematics course taking among qualified students in the 2017 cohort—although this was not the case for the other cohorts.

The implementation of Academic Acceleration policies also was associated with larger increases in advanced ELA/social studies and mathematics course enrollment for all URM and FRPL-eligible students regardless of qualified status than for all non-URM and non-FRPL-eligible students. Across cohorts, policy implementation was associated, on average, with a 2 percentage point larger increase in ELA/social studies enrollment for both URM and FRPL-eligible students compared with their non-URM and non-FRPL-eligible peers, and with a 3.1 and 3.8 percentage point larger increase in mathematics enrollment for URM and FRPL-eligible students, respectively, compared with non-URM and non-FRPL-eligible students.

Taken together, these changes translate into narrowed enrollment gaps by URM status and FRPL status from before policy implementation to after policy implementation. However, despite the policy targeting students with qualifying assessment scores, the narrowing of the URM and FRPL gaps was not driven by increases in advanced course taking by qualified students relative to nonqualified students: As discussed in Section 5, treated districts experienced increases in advanced course enrollment for URM groups relative to non-URM groups regardless of qualified status. These results suggest that making advanced courses opt out rather than opt in may change students' opportunities to enroll in advanced courses. Specifically, increases in the probability of advanced mathematics course enrollment among qualified students in policy-implementing districts suggest that Academic Acceleration may have identified and enrolled qualified students who may not have enrolled before policy implementation. Interestingly, the increases in any advanced course enrollment for all students (qualified and not qualified) suggest that districts with Academic Acceleration policies also may have broadened their eligibility criteria beyond standardized test scores or by encouraging students to try out an advanced course outside the core ELA, social studies, and mathematics subject areas. But even as the policy opened these courses to more students, demographic gaps remained, especially in advanced mathematics. These gaps have important implications for equity and suggest future research directions.

Before policy implementation, the share of qualified students in early-implementing districts who enrolled in an advanced mathematics course was lower than the share who enrolled in ELA: only 14% of the students who qualified for an advanced mathematics course were enrolled in such a course compared with 23.4% of qualified students enrolled in an advanced ELA or social studies course and 39.9% of qualified students enrolled in any advanced course. As a result, the potential for increases in advanced mathematics course taking was especially large. Although advanced mathematics enrollments increased for all students under the policy, the results suggest that they increased disproportionately for more advantaged students. Sociological theories of maintained inequality suggest that advantaged students are the first to benefit from expansion of educational opportunities, potentially accounting for what we observe in advanced mathematics (Domina & Saldana, 2012; Haim & Shavit, 2013; Lucas & Byrne, 2017).

Our analyses did not examine potential constraints on the extent to which advanced course enrollments could expand in policy-implementing districts. It is possible that advanced course enrollments could continue to increase as a result of the policy, but there may be limits to districts' and schools' advanced course capacity. These might include limits on class sizes, lack of trained teachers, and inadequate course materials (such as textbooks). Although the policy may have successfully nudged more students into wanting to enroll in advanced courses, a simple nudge would not address the logistical and financial considerations associated with expanding advanced course capacity to accommodate more students. If demand exceeded capacity, it is unclear how districts decided which students to enroll from among all qualified students. Further, even if the policy was implemented as designed, students still have the option to opt out of advanced courses, and the tendency to opt out may vary along demographic lines. Especially in the early years of policy implementation, students from URM groups may still be in the minority among their classmates and may lack of sense of belonging (Karakos et al., 2021). Differences in knowledge about the benefits of advanced courses also may affect decisions to remain enrolled or opt out. More research is needed to understand opt-out rates and reasons why students may opt out of some or all advanced courses for which they are qualified.

Our paper suggests that it would be fruitful in future research on the effects of automatic enrollment to examine other identification strategies that districts may use beyond test scores. The relative increase in enrollments for qualified and nonqualified students from URM groups and FRPL groups, for example, provides suggestive evidence that districts are taking a more holistic approach to their definitions of "qualified," which can increase equitable enrollment. This is consistent with the qualitative data we collected from policy-implementing districts. Although all districts formally adopted the same standard policy language, there was substantial variation across districts in how the policy played out in practice. For example, some districts reported using multiple measures to identify qualified students beyond the standardized test scores referenced in the policy, including prior grades, scores on other tests, and teacher and counselor recommendations. Some of these measures might increase equity by providing multiple pathways for students to qualify for advanced courses, but this is not clear for all measures. Standardized test scores, for instance, tend to be correlated with race/ethnicity and income; using only test scores to identify qualified students arguably overlooks students who could be successful in advanced courses based on other attributes correlated with achievement. But we do not know much about the extent to which traditional identification methods, such as teacher or counselor recommendations, might be affected by district commitments to expanding access to advanced coursework. The bottom line is that we need more research on variations in policy implementation and how those variations affect the policy's effectiveness.

Given access to postsecondary data, it would be useful to track the longer term outcomes of the students who were successfully nudged into one or more advanced courses by Academic Acceleration, as identified by their prior course enrollment or via a regression discontinuity design. This would provide insight into the effectiveness of advanced course taking on various postsecondary outcomes, including college matriculation, graduation, and choice of major. The outcomes of students who were not directly affected by automatic enrollment into an advanced course also is of interest; these students would include unqualified students who remained behind in standard-level courses because they missed the automatic enrollment cutoff, qualified students who met the cutoff but opted out of the policy, and qualified students who would have taken advanced courses regardless of whether the policy was implemented. Although our estimates and prior literature on peer effects would suggest that the policy did not induce large enough changes in peer composition to create substantial peer effects, early-implementing districts that participated in our qualitative data collection indicated that the policy aimed to create more inclusive attitudes toward advanced course taking among adults and students, a change that could have indirect effects on student learning.

Lastly, Washington's policy language recently was updated to allow for automatic enrollment based on eighth-grade assessments, rather than only high school assessments. For students who qualified based on their eighth-grade scores, an earlier nudge into advanced courses could prepare them for success in advanced courses later in high school. Although the dual credit courses that are the focus of the Academic Acceleration policy often are offered only to high school students in later grades, honors, pre-AP, and other accelerated courses earlier in high school could put students on the path toward greater readiness for dual credit advanced courses later. This could lead to larger effects on enrollment and success in advanced courses throughout high school. Once several cohorts of students have been affected by this updated policy, a follow-up study could offer insights into its effectiveness, with implications for the timing of high school policy interventions.

References

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. U.S. Department of Education, National Center for Educational Statistics. https://eric.ed.gov/?id=ED490195

An, B. P., & Taylor, J. L. (2019). A review of empirical studies on dual enrollment: Assessing educational outcomes. *Higher education: Handbook of theory and research* (pp. 99–151). Springer.

Anderson, K. P. (2022). *Biased opportunities: The role of implicit and explicit bias in Advanced Placement and dual enrollment* (EdWorkingPaper 22-554). Brown University, Annenberg Institute. https://doi.org/10.26300/g600-0d47

Austin, M. (2017). *High school curricular intensity: Inequalities in access and returns over three cohorts.* [Unpublished doctoral dissertation]. University of Notre Dame.

Austin, M. (2020). Measuring high school curricular intensity over three decades. *Sociology of Education*, *93*(1), 65–90. https://eric.ed.gov/?id=EJ1237969

Avery, C., Gurantz, O., Hurwitz, M., & Smith, J. (2018). Shifting college majors in response to advanced placement exam scores. *Journal of Human Resources*, *53*(4), 918–956. https://www.muse.jhu.edu/article/706372

Benartzi, S., & Thaler, R. (2007). Heuristics and biases in retirement savings behavior. *Journal of Economic Perspectives*, *21*(3), 81–104. https://doi.org/10.1257/jep.21.3.81

Campbell-Cunefare, T. (2020). *I feel like an AP student that doesn't belong: Nontraditional students of color discuss academic identity, positionality, and support in the figured world of AP United States history.* [Unpublished doctoral dissertation]. University of California–San Diego.

Card, D., & Giuliano, L. (2014). *Does gifted education work? For which students?* (Working Paper 20453). National Bureau of Economic Research. https://www.nber.org/papers/w20453

Card, D., & Giuliano, L. (2016). Universal screening increases the representation of low-income and minority students in gifted education. *Proceedings of the National Academy of Sciences*, *113*(48), 13678–13683. https://doi.org/10.1073/pnas.1605043113

College Board. (2013). *The 9th annual AP report to the nation*. https://secure-media.collegeboard.org/digitalServices/pdf/ap/rtn/9th-annual/9th-annual-ap-report-single-page.pdf

Conger, D., Long, M. C., & Iatarola, P. (2009). Explaining race, poverty, and gender disparities in advanced course-taking. *Journal of Policy Analysis and Management*, *28*, 555–576. http://www.jstor.org/stable/20685142

Conger, D., Kennedy, A. I., Long, M. C., & McGhee, R., Jr. (2021). The effect of Advanced Placement science on students' skills, confidence, and stress. *Journal of Human Resources*, *56*(1), 93–124. https://doi.org/10.3368/jhr.56.1.0118-9298R3

Darity, W., Castellino, D., & Tyson, K. (2001). *Increasing opportunity to learn via access to rigorous courses and programs: One strategy for closing the achievement gap for at-risk and ethnic minority students*. North Carolina State Department of Public Instruction. https://eric.ed.gov/?id=ED459303

De Chaisemartin, C., & d'Haultfoeuille, X. (2020). Two-way fixed effects estimators with heterogeneous treatment effects. *American Economic Review*, *110*(9), 2964–2996. https://doi.org/10.1257/aer.20181169

Domina, T., & Saldana, J. (2012). Does raising the bar level the playing field? Mathematics curricular intensification and inequality in American high schools, 1982–2004. *American Educational Research Journal*, *49*, 685–708.

Dougherty, S. M., Goodman, J. S., Hill, D. V., Litke, E. G., & Page, L. C. (2015). Middle school math acceleration and equitable access to eighth- grade algebra: Evidence from the Wake County Public School System. *Educational Evaluation and Policy Analysis*, *37*(1S), 80S–101S. https://doi.org/10.3102/0162373715576076

Dougherty, S. M., Goodman, J. S., Hill, D. V., Litke, E. G., & Page, L. C. (2017). Objective course placement and college readiness: Evidence from targeted middle school math acceleration. *Economics of Education Review*, *58*, 141–161. https://doi.org/10.1016/j.econedurev.2017.04.002

Equal Opportunity Schools. (2022). *Action For Equity: The Equal Opportunity Schools program for school districts*. https://eoschools.org/approach/action-for-equity/

Evans, B. J. (2018). How college students use Advanced Placement credit. *American Educational Research Journal*, *56*(3), 925–954. https://doi.org/10.3102/0002831218807428

Ferguson, R. (2007). *Toward excellence with equity: An emerging vision for closing the achievement gap*. Harvard Education Press.

Haim, E. B., & Shavit, Y. (2013). Expansion and inequality of educational opportunity: A comparative study. *Research in Social Stratification and Mobility*, *31*, 22–31.

Hornby, G., & Lafaele, R. (2011). Barriers to parental involvement in education: An explanatory model. *Educational Review*, *63*(1), 37–52. https://doi.org/10.1080/00131911.2010.488049

Jackson, C. K. (2014). Do college-prep programs improve long-term outcomes? *Journal of Economic Inquiry*, *52*(1), 72–99. https://doi.org/10.1111/ecin.12040

Johnson, E. J., & Goldstein, D. (2003). Do defaults save lives? *Science*, *302*(5649), 1338–1339. https://doi.org/10.1126/science.1091721

Karakos, H., Rabkin, S., & Torres, A. (2021). *Measuring what matters: The cues and conditions of student belonging.* Equal Opportunity Schools. http://eoschools.org/wp-content/uploads/2021/07/Measuring-what-Matters-%E2%80%93-The-Cues-and-Conditions-of-Student-Belonging.pdf

Keller, R. J. (2008). *In their own voices: African American students talk about rigorous course work with a focus on science*. [Unpublished doctoral dissertation]. Hamline University.

Klopfenstein, K. (2004). Advanced Placement: Do minorities have equal opportunity? *Economics of Education Review*, *23*(2), 115–131. https://doi.org/10.1016/S0272-7757(03)00076-1

Kolluri, S. (2018). Advanced Placement: The dual challenge of equal access and effectiveness. *Review of Educational Research*, *88*(5), 671–711. https://doi.org/10.3102/0034654318787268

Lewis, A. E., & Diamond, J. B. (2015). *Despite the best intentions: How racial inequality thrives in good schools*. Oxford University Press.

Long, M. C., Conger, D., & Iatarola, P. (2012). Effects of high school course-taking on secondary and postsecondary success. *American Educational Research Journal*, *49*(2), 285–322. https://doi.org/10.3102/0002831211431952

Lucas, S. R., & Byrne, D. (2017). Effectively maintained inequality in education: An introduction. *American Behavioral Scientist*, *61*(1), 3-7.

McBee, M. T. (2016). What you don't look for, you won't find: A commentary on Card and Guiliano's examination of universal screening. *Journal of Advanced Academics*, *27*(2), 131–138. https://doi.org/10.1177/1932202X16634141

McEachin, A., Domina, T., & Penner, A. (2020). Heterogeneous effects of early algebra across California middle schools. *Journal of Policy Analysis and Management*, *39*(3), 772–800. https://doi.org/10.1002/pam.22202

Miller, T., Kosiewicz, H., Tanenbaum, C., Atchison, D., Knight, D., Ratway, B., Delhommer, S., & Levin, S. (2018). *Dual-credit education programs in Texas: Phase II.* American Institutes for Research. https://www.air.org/sites/default/files/Dual-Credit-Education-Programs-in-Texas-Phase-II-July-2018.pdf

Patrick, K., Socol, A. R., & Morgan, I. (2020). *Inequities in advanced coursework: What's driving them and what leaders can do.* The Education Trust. https://edtrust.org/resource/inequities-in-advanced-coursework/

Price, H. (2021). *The fractured college prep pipeline: Hoarding opportunities to learn.* Teachers College Press.

Sherman, D., Li, Y., Darwin, M., Taylor, S., & Song, M. (2017). *Final report of the impacts of the National Math + Science Initiative's (NMSI's) College Readiness Program on high school students' outcomes.* American Institutes for Research. https://files.eric.ed.gov/fulltext/ED577450.pdf

Smith, M. J. (2008). College choice process of first generation black female students: Encouraged to what end? *Negro Educational Review*, *59*(3/4), 147. https://eric.ed.gov/?id=EJ835222

Stand for Children. (2019). *Breaking down barriers: Academic Acceleration resource guide*.

Sweeney, D. (2016). *Professional school counselors: Integral stakeholders in the recruitment, retention, and support of African American, Latino, and low-income students in advanced placement programs* [Unpublished doctoral dissertation]. University of Louisville.

Thaler, R., H., & Benartzi, S. (2004). Save More Tomorrow™: Using behavioral economics to increase employee saving. *Journal of Political Economy*, 112(S1), S164–S187. https://doi.org/10.1086/380085

Theokas, C., & Saaris, R. (2013). *Finding America's missing AP and IB students.* The Education Trust. https://edtrust.org/wp-content/uploads/2013/10/Missing_Students.pdf

Thorndike, A. N., Sonnenberg, L., Riis, J., Barraclough, S., & Levy, D. E. (2012). A 2-phase labeling and choice architecture intervention to improve healthy food and beverage choices. *American Journal of Public Health*, *102*(3), 527–533. https://doi.org/10.2105/AJPH.2011.300391

Walker, E. N. (2007). Why aren't more minorities taking advanced math? *Educational Leadership*, *65*(3), 48–53. https://eric.ed.gov/?id=EJ779286

Washington Education Research and Data Center. (2020). *Washington state P20W longitudinal data system research handbook*. https://erdc.wa.gov/sites/default/files/ERDC%20SLDS%20P20W%20Research%20Handbook_Oct20.pdf

What Works Clearinghouse. (2020). *Standards handbook, Version 4.1.* U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://ies.ed.gov/ncee/wwc/Docs/referenceresources/WWC-Standards-Handbook-v4-1-508.pdf

Xu, D., Solanki, S., & Fink, J. (2021). College acceleration for all? Mapping racial gaps in Advanced Placement and dual enrollment participation. *American Educational Research Journal*, *58*(5), 954–992. https://doi.org/10.3102/0002831221991138

Tables and Figures

Table 1. District Characteristics for Grades 11 and 12 by Policy Adoption Status, 2010–11 through 2013–14

	All districts			Policy adopting districts			Comparison districts		
Number of districts	240			72			168		
Average annual Grades 11 and 12 enrollment	587			569			594		
Student category	**All**	**URM**	**FRPL**	**All**	**URM**	**FRPL**	**All**	**URM**	**FRPL**
Total number of students	561,528	160,527	223,443	163,882	52,196	77,213	397,646	108,331	146,230
Percentage of all students		28.6%	39.8%		31.8%	47.1%		27.2%	36.8%
Average number of advanced courses taken	0.67	0.44	0.37	0.53	0.36	0.32	0.72	0.47	0.40
Proficiency									
Percentage of students meeting standards in ELA (as of prior year)	72.0%	61.0%	61.0%	69.0%	59.0%	59.0%	73.0%	63.0%	62.0%
Percentage of students meeting standards in mathematics (as of prior year)	46.0%	35.0%	36.0%	44.0%	33.0%	35.0%	47.0%	36.0%	37.0%
ELA or SS									
Percentage of all students enrolled in any ELA or SS	86.0%	88.0%	89.0%	86.0%	88.0%	88.0%	87.0%	88.0%	90.0%
Percentage of all students enrolled in advanced ELA or SS	24.0%	18.0%	15.0%	21.0%	15.0%	14.0%	26.0%	19.0%	16.0%
Mathematics									
Percentage of all students enrolled in any mathematics course	79.0%	82.0%	81.0%	78.0%	82.0%	80.0%	79.0%	81.0%	81.0%
Percentage of all students enrolled in advanced mathematics	13.0%	7.0%	6.0%	9.0%	5.0%	5.0%	14.0%	8.0%	7.0%

Note. This table shows district summary statistics for 11th- and 12th-grade students by policy adoption status, aggregated from 2010–11 to 2013–14. All values are weighted at the individual level except for average enrollment, which is averaged across districts. All data except proficiency are aggregated across the years, which are the prepolicy years for all four cohorts (2010/11–2013/14). ELA = English language arts; FRPL = free or reduced-price lunch; SS = social studies; URM = underrepresented minorities.

Table 2. Prepolicy and Postpolicy Probabilities of Enrolling in At Least One Advanced Course, by Subject

			Prepolicy (2011–2014)			Postpolicy (2017–2019)		
			Comparison	Early adopters	SMD	Comparison	Early adopters	SMD
Percentage enrolled in an advanced ELA or social studies course	All		26.0%	20.8%	0.12	27.4%	26.0%	0.03
	Not qualified		7.0%	4.9%	0.09	10.0%	10.04%	0.01
	Qualified	All Qualified	23.4%	20.7%	0.06	26.4%	26.9%	0.01
		Not URM	34.6%	29.5%	0.11	37.5%	37.2%	0.01
		URM	27.3%	23.3%	0.09	34.1%	34.0%	0.00
		Not URM - URM Gap	*7.4*	*6.1*	*0.02*	*3.4*	*3.2*	*0.00*
		Not FRPL	37.3%	32.6%	0.10	39.4%	38.8%	0.01
		FRPL	23.3%	20.8%	0.06	29.3%	31.3%	0.04
		Not FRPL - FRPL Gap	*14.0*	*11.8*	*0.04*	*10.1*	*7.5*	*-0.03*
Percentage enrolled in an advanced mathematics course	All		14.0%	9.1%	0.15	15.5%	12.9%	0.08
	Not qualified		10.6%	6.4%	0.15	4.4%	3.6%	0.04
	Qualified	All Qualified	17.9%	12.6%	0.15	24.9%	22.3%	0.06
		Not URM	19.2%	13.7%	0.15	26.9%	24.1%	0.06
		URM	13.2%	9.4%	0.12	19.1%	18.3%	0.03
		Not URM - URM Gap	*5.9*	*4.3*	*0.03*	*7.8*	*5.8*	*0.04*
		Not FRPL	20.8%	15.3%	0.14	28.3%	25.9%	0.05
		FRPL	11.0%	8.2%	0.10	15.7%	15.5%	0.00
		Not FRPL - FRPL Gap	*9.8*	*7.2*	*0.05*	*12.6*	*10.4*	*0.05*

			Prepolicy (2011–2014)			Postpolicy (2017–2019)		
			Comparison	**Early adopters**	**SMD**	**Comparison**	**Early adopters**	**SMD**
Percentage enrolled in an advanced course in any subject	All		39.9%	31.5%	0.19	45.3%	44.2%	0.02
	Not qualified		11.5%	8.0%	0.12	15.9%	18.6%	0.07
	Qualified	All Qualified	48.2%	39.8%	0.17	56.2%	52.5%	0.01
		Not URM	50.9%	42.1%	0.18	58.5%	57.6%	0.02
		URM	39.3%	33.9%	0.11	50.3%	51.4%	0.02
		Not URM - URM Gap	*11.6*	*8.3*	*0.06*	*8.3*	*6.3*	*0.00*
		Not FRPL	54.2%	46.3%	0.16	60.3%	59.8%	0.01
		FRPL	35.4%	30.7%	0.10	46.4%	48.3%	0.03
		Not FRPL - FRPL Gap	*18.8*	*15.6*	*0.06*	*14.0*	*11.5*	*-0.03*

Note. This table shows summary statistics and standardized mean differences (SMDs) for 11th- and 12th-grade students by district policy adoption status and by student qualified status and demographic status. SMD is between comparison districts and early adopting districts. Prepolicy statistics are aggregated across all pre-implementation years shared in common across cohorts, and postpolicy statistics are aggregated across all post-implementation years shared in common for each cohort. All values are weighted at the individual level. FRPL = free or reduced-price lunch; URM = underrepresented minorities

Table 3. Results of DID Models Estimating Change in Student-Level Probability of Enrolling in at Least One Advanced Course, by Subject Area

	2015 cohort	2016 cohort	2017 cohort	All cohorts
Any advanced ELA or SS course	0.037 (0.035)	0.027*** (0.009)	0.017 (0.020)	0.028 (0.019)
Any advanced mathematics course	0.019 (0.014)	-0.009 (0.011)	0.034** (0.015)	0.016 (0.011)
Any advanced course in any subject	0.073** (0.033)	0.050** (0.022)	0.029 (0.022)	0.053*** (0.020)

Note. This table shows estimates from Model 1, in which *Policy* equals 1 in policy-adopting districts in post-policy years and 0 otherwise. Each coefficient on *Policy* represents the change in students' probability of enrollment in an advanced course in each subject area. Standard errors are in parentheses. All models include district and year fixed effects. Standard errors are clustered at the district level. ELA = English language arts; SS = social studies.

**$p < .01$. ***$p < .001$.

Table 4. Results of DID Models Estimating Change in Student-Level Probability of Enrolling in at Least One Advanced Course, by Subject Area and Qualified Status

	2015 cohort	2016 cohort	2017 cohort	All cohorts
Any advanced ELA or SS course				
Policy	0.043	0.022	-0.008	0.025
	(0.029)	(0.017)	(0.039)	(0.019)
Qualified	0.187***	0.187***	0.190***	0.188***
	(0.008)	(0.008)	(0.008)	(0.007)
Interaction	-0.008	0.008	0.040	0.005
	(0.020)	(0.019)	(0.034)	(0.015)
Any advanced mathematics course				
Policy	0.003	-0.013	-0.024	-0.010
	(0.012)	(0.014)	(0.018)	(0.011)
Qualified	0.091***	0.093***	0.092***	0.088***
	(0.006)	(0.006)	(0.006)	(0.006)
Interaction	0.030*	0.008	0.109***	0.048***
	(0.017)	(0.012)	(0.024)	(0.015)
Any advanced course in any subject				
Policy	0.072**	0.061**	-0.008	0.044*
	(0.036)	(0.026)	(0.023)	(0.022)
Qualified	0.250***	0.250***	0.253***	0.250***
	(0.011)	(0.011)	(0.011)	(0.010)
Interaction	0.003	-0.016	0.051***	0.012
	(0.023)	(0.037)	(0.016)	(0.017)

Note. The coefficients in this table are from models that added an interaction term between *Policy* and *Qualified*, in which *Policy* equals 1 in policy-adopting districts in post-policy years and 0 otherwise, and *Qualified* equals 1 if a student has a standardized assessment score at or above the threshold for proficiency and 0 otherwise (including students who have not yet taken the relevant end-of-course assessment(s)). Coefficients on interaction terms represent the percentage point changes in the probability of enrollment for students who are qualified in that subject, relative to students who are not qualified in that subject. Standard errors are in parentheses. All models include school year and district fixed effects, with standard errors clustered at the district level. ELA = English language arts; SS = social studies.

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

Table 5. Results of DID Models Estimating Change in Student-Level Probability of Enrolling in at Least One Advanced Course, by Qualified Status and URM Status

	2015 cohort	2016 cohort	2017 cohort	All cohorts
Any advanced ELA or SS course				
Policy	0.034	0.020	-0.031	0.014
	(0.029)	(0.020)	(0.026)	(0.018)
Qualified	0.197***	0.198***	0.202***	0.199***
	(0.009)	(0.009)	(0.009)	(0.008)
URM	-0.003	-0.003	-0.002	-0.003
	(0.005)	(0.005)	(0.005)	(0.004)
Policy * Qualified	-0.010	0.003	0.059**	0.007
	(0.021)	(0.025)	(0.025)	(0.016)
Policy * URM	0.016	0.003	0.047**	0.020**
	(0.011)	(0.010)	(0.022)	(0.009)
Qualified * URM	-0.029***	-0.030***	-0.033***	-0.031***
	(0.006)	(0.006)	(0.006)	(0.006)
Policy * Qualified * URM	0.018	0.020	-0.030	0.009
	(0.016)	(0.033)	(0.019)	(0.012)
Any advanced mathematics course				
Policy	-0.008	-0.027*	-0.046***	-0.024**
	(0.013)	(0.016)	(0.014)	(0.012)
Qualified	0.093***	0.095***	0.094***	0.089***
	(0.006)	(0.006)	(0.006)	(0.006)
URM	-0.036***	-0.036***	-0.036***	-0.036***
	(0.006)	(0.006)	(0.006)	(0.005)
Policy * Qualified	0.031*	0.014	0.137***	0.058***
	(0.019)	(0.015)	(0.024)	(0.017)
Policy * URM	0.024**	0.030***	0.050***	0.031***
	(0.010)	(0.008)	(0.007)	(0.007)
Qualified * URM	-0.007**	-0.008**	-0.007*	-0.006*
	(0.004)	(0.004)	(0.004)	(0.004)
Policy * Qualified * URM	0.006	-0.006	-0.074***	-0.016
	(0.020)	(0.016)	(0.026)	(0.015)

	2015 cohort	2016 cohort	2017 cohort	All cohorts
Any advanced course in any subject				
Policy	0.067	0.054*	-0.025	0.037
	(0.043)	(0.029)	(0.024)	(0.027)
Qualified	0.261***	0.262***	0.265***	0.262***
	(0.011)	(0.012)	(0.012)	(0.010)
URM	-0.027***	-0.028***	-0.027***	-0.028***
	(0.007)	(0.007)	(0.007)	(0.006)
Policy * Qualified	-0.003	-0.015	0.062***	0.012
	(0.028)	(0.029)	(0.017)	(0.019)
Policy * URM	0.006	0.013	0.034**	0.013
	(0.019)	(0.026)	(0.016)	(0.014)
Qualified * URM	-0.029***	-0.030***	-0.032***	-0.030***
	(0.007)	(0.007)	(0.007)	(0.007)
Policy * Qualified * URM	0.022	0.006	-0.010	0.013
	(0.020)	(0.037)	(0.016)	(0.015)

Note. The coefficients in this table are from models that added an interaction term between *Policy* * *Qualified* * *URM*, in which *Policy* equals 1 in policy-adopting districts in postpolicy years and 0 otherwise, *Qualified* equals 1 if a student has a standardized assessment score at or above the threshold for proficiency and 0 otherwise (including students who have not yet taken the relevant end-of-course assessment(s)), and *URM* equals 1 if a student is a member of a racial/ethnic group historically underrepresented in advanced courses and 0 otherwise. Coefficients on interaction terms represent the percentage point changes in the probability of enrollment for students who are qualified in that subject and who are members of an URM group, relative to students who are not qualified in that subject and who are not members of an URM group. Standard errors are in parentheses. All models include school year and district fixed effects, with standard errors clustered at the district level. ELA = English language arts; SS = social studies; URM = underrepresented minorities.

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

Table 6. Results of DID Models Estimating Change in Student-Level Probability of Enrolling in at Least One Advanced Course, by Qualified Status and FRPL Status

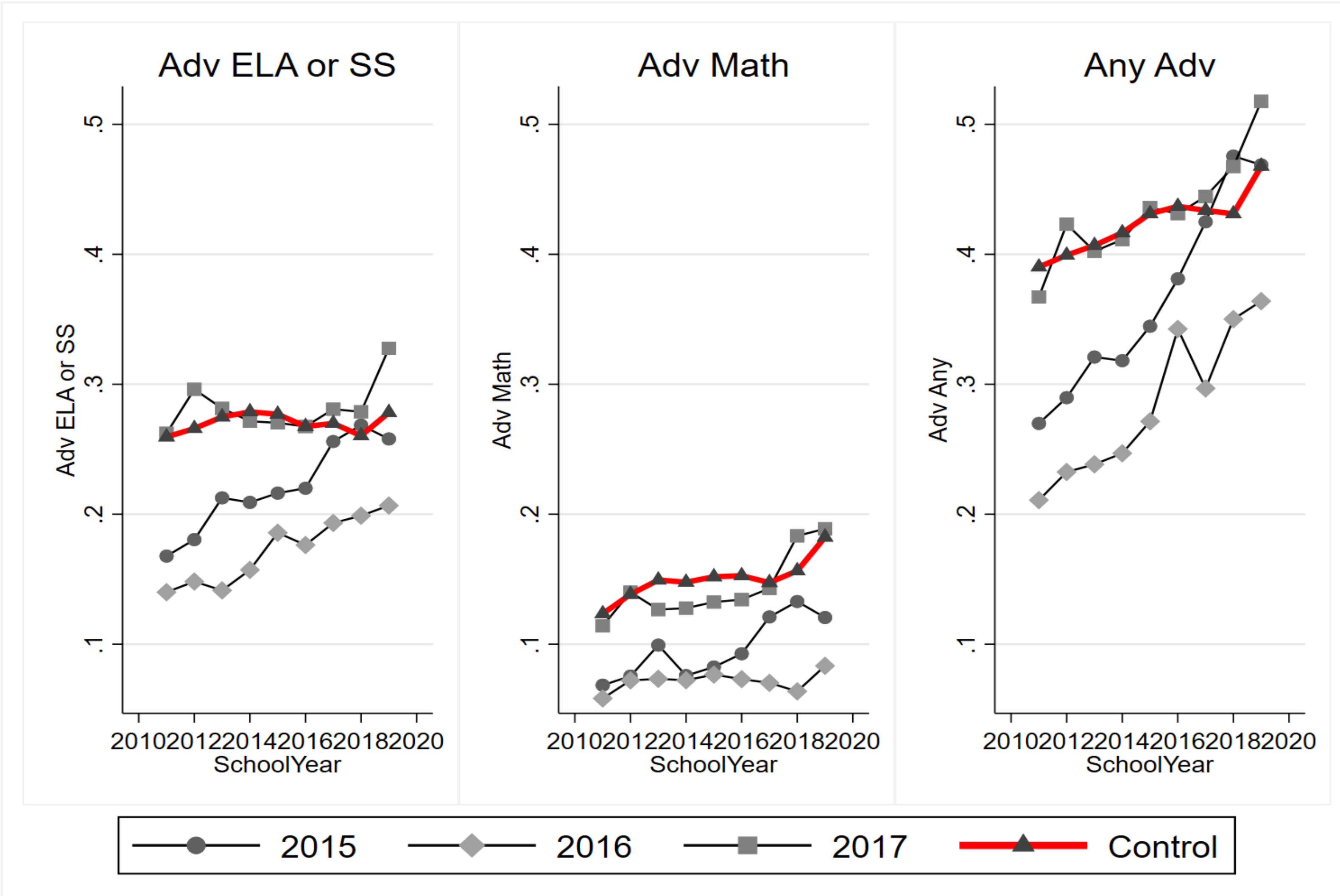
	2015 cohort	2016 cohort	2017 cohort	All cohorts
Any advanced ELA or SS course				
Policy	0.033	0.008	-0.028	0.012
	(0.034)	(0.016)	(0.033)	(0.021)
Qualified	0.224***	0.223***	0.227***	0.225***
	(0.009)	(0.009)	(0.009)	(0.009)
FRPL	-0.021**	-0.020**	-0.020**	-0.020***
	(0.008)	(0.008)	(0.008)	(0.007)
Policy * Qualified	-0.012	0.001	0.046	0.004
	(0.017)	(0.019)	(0.032)	(0.014)
Policy * FRPL	0.011	0.022*	0.041**	0.020*
	(0.015)	(0.012)	(0.016)	(0.011)
Qualified * FRPL	-0.082***	-0.082***	-0.084***	-0.083***
	(0.006)	(0.006)	(0.006)	(0.006)
Policy * Qualified * FRPL	0.026	0.036	0.009	0.023*
	(0.019)	(0.022)	(0.012)	(0.013)
Any advanced mathematics course				
Policy	-0.014	-0.037**	-0.047***	-0.030**
	(0.013)	(0.015)	(0.015)	(0.012)
Qualified	0.106***	0.108***	0.107***	0.102***
	(0.007)	(0.007)	(0.007)	(0.007)
FRPL	-0.044***	-0.042***	-0.043***	-0.044***
	(0.005)	(0.005)	(0.005)	(0.004)
Policy * Qualified	0.043**	0.016	0.137***	0.067***
	(0.018)	(0.014)	(0.025)	(0.017)
Policy * FRPL	0.031***	0.042***	0.048***	0.038***
	(0.009)	(0.009)	(0.007)	(0.007)
Qualified * FRPL	-0.040***	-0.041***	-0.040***	-0.038***
	(0.005)	(0.005)	(0.005)	(0.005)
Policy * Qualified * FRPL	-0.015	0.001	-0.065**	-0.029**
	(0.015)	(0.010)	(0.027)	(0.014)

	2015 cohort	2016 cohort	2017 cohort	All cohorts
Any advanced course in any subject				
Policy	0.069	0.030	-0.030	0.032
	(0.043)	(0.022)	(0.027)	(0.027)
Qualified	0.292***	0.291***	0.295***	0.293***
	(0.012)	(0.012)	(0.012)	(0.011)
FRPL	-0.041***	-0.040***	-0.039***	-0.039***
	(0.008)	(0.008)	(0.008)	(0.007)
Policy * Qualified	-0.001	-0.013	0.057***	0.011
	(0.023)	(0.028)	(0.018)	(0.017)
Policy * FRPL	-0.001	0.051	0.042	0.018
	(0.021)	(0.035)	(0.027)	(0.017)
Qualified * FRPL	-0.087***	-0.086***	-0.089***	-0.089***
	(0.008)	(0.008)	(0.008)	(0.007)
Policy * Qualified * FRPL	0.019	0.020	0.012	0.018
	(0.023)	(0.027)	(0.026)	(0.017)

Note. the coefficients in this table are from models that added an interaction term between *Policy* * *Qualified* * *FRPL*, in which *Policy* equals 1 in policy-adopting districts in postpolicy years and 0 otherwise, *Qualified* equals 1 if a student has a standardized assessment score at or above the threshold for proficiency and 0 otherwise (including students who have not yet taken the relevant end-of-course assessment(s)), and *FRPL* equals 1 if a student is eligible for free or reduced-price lunch and 0 otherwise. Coefficients on interaction terms represent the percentage point changes in the probability of enrollment for students who are qualified in that subject and who are eligible for FRPL, relative to students who are not qualified in that subject and who are not eligible FRPL. Standard errors are in parentheses. All models include school year and district fixed effects, with standard errors clustered at the district level. ELA = English language arts; FRPL = free or reduced-price lunch; SS = social studies.

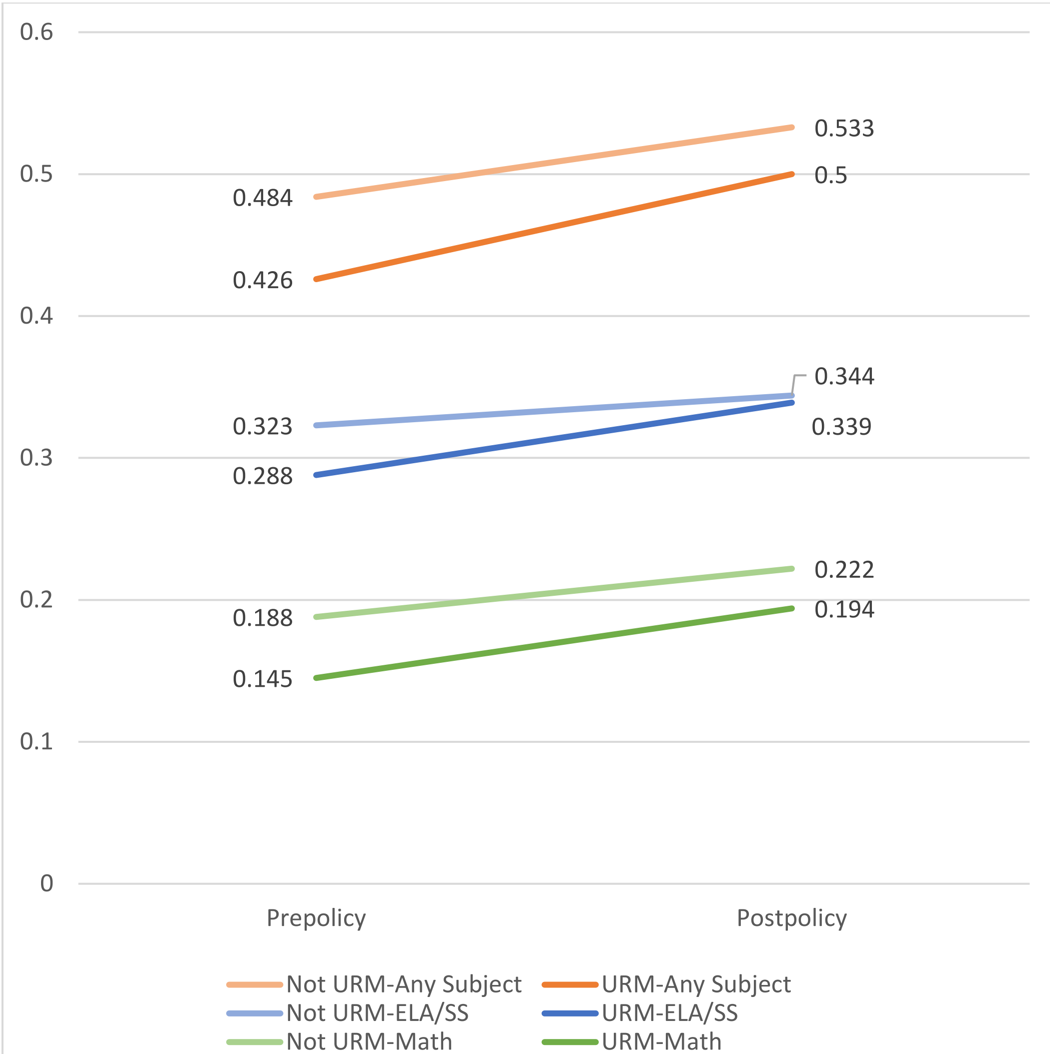
*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

Figure 1. Parallel Trends Analysis



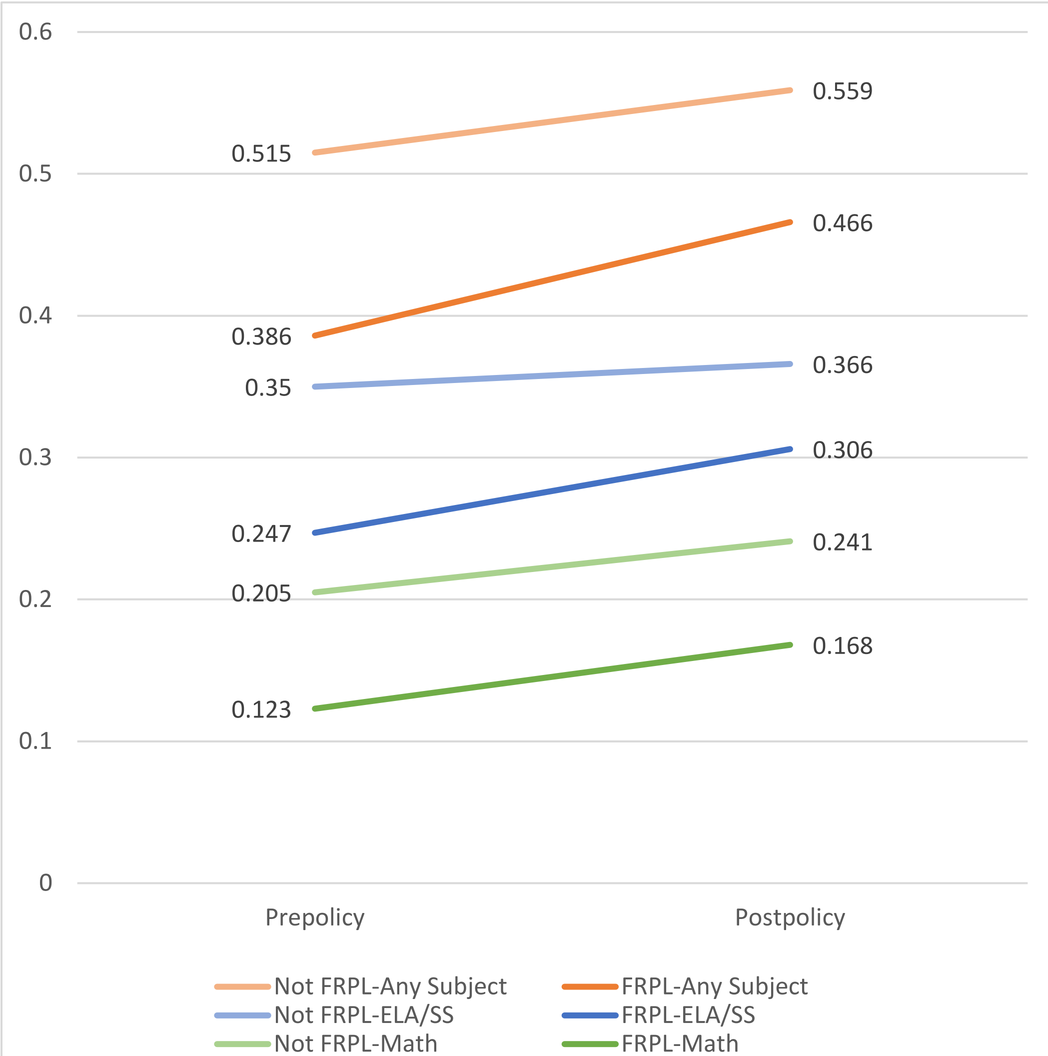
Note. This figure shows policy-implementing cohorts of 2015, 2016, and 2017, along with comparison districts. Adv = advanced; ELA = English language arts, SS = social studies.

Figure 2. Advanced Course Gaps for Qualified Students in Policy-Implementing Districts by URM Status



Note. This graph shows predicted probabilities of enrolling in an advanced course for students in each early implementation cohort by subject area, pre- and postpolicy implementation. Predicted probabilities are based on models containing three-way interaction terms for *Policy * Qualified * URM Status.* ELA = English language arts; SS = social studies; URM = underrepresented minorities.

Figure 3. Advanced Course Gaps for Qualified Students in Policy Implementing Districts by FRPL Status



Note. The graph shows predicted probabilities of enrolling in an advanced course for students in each early implementation cohort by subject area, pre- and postpolicy implementation. Predicted probabilities are based models containing three-way interaction terms for *Policy * Qualified * FRPL Status.* ELA = English language arts; FRPL = free or reduced-price lunch; SS = social studies.

Appendix

Section A1. Original Academic Acceleration Policy Language (2013)

The original Academic Acceleration policy, passed in 2013, is the version of the policy that the districts in our sample adopted, although our qualitative data collection with early-implementing districts indicates that the extent to which districts defined qualification narrowly as having met the proficiency threshold on the relevant state standardized assessment(s), as well as the procedures for "automatically" enrolling qualified students. Note that all policy-adopting districts included the following text at the beginning of the Academic Acceleration policy:

The board recognizes the need for all high school students to have greater access to rigorous advanced courses, including dual credit programs.

RCW 28A.320.195 (2013 c 184 s 2): Academic acceleration for high school students -- Adoption of policy (*Effective July 28, 2013*)

(1) Each school district board of directors is encouraged to adopt an academic acceleration policy for high school students as provided under this section.

(2) Under an academic acceleration policy:

a. The district automatically enrolls any student who meets the state standard on the high school statewide student assessment in the next most rigorous level of advanced courses offered by the high school. Students who successfully complete such an advanced course are then enrolled in the next most rigorous level of advanced course, with the objective that students will eventually be automatically enrolled in courses that offer the opportunity to earn dual credit for high school and college.

b. The subject matter of the advanced courses in which the student is automatically enrolled depends on the content area or areas of the statewide student assessment where the student has met the state standard. Students who meet the state standard on both end-of-course mathematics assessments are considered to have met the state standard for high school mathematics. Students who meet the state standard in both reading and writing are eligible for enrollment in advanced courses in English, social studies, humanities, and other related subjects.

c. The district must notify students and parents or guardians regarding the academic acceleration policy and the advanced courses available to students.

d. The district must provide a parent or guardian with an opportunity to opt out of the academic acceleration policy and enroll a student in an alternative course.

Section A2. Updated Academic Acceleration Policy Language (2019)

The updated version of Academic Acceleration, passed in 2019, included two major changes: (a) mandating adoption for all districts by 2022 and (b) allowing students to qualify for auto-enrollment in advanced courses based on either eighth-grade or high school assessments (compared with only high school assessments in the 2013 version). Note that all policy-adopting districts included the following text at the beginning of the Academic Acceleration policy:

The board recognizes the need for all high school students to have greater access to rigorous advanced courses, including dual credit programs.

RCW 28A.320.195 (2019 c 252 s 502): Academic acceleration for high school students -- Adoption of policy (*Effective July 28, 2019*)

1. By the 2021-22 school year, each school district board of directors shall adopt an academic acceleration policy for high school students as provided under this section.
2. Under an academic acceleration policy:
    a. The district shall automatically enroll any student who meets or exceeds the state standard on the eighth grade or high school English language arts or mathematics statewide student assessment in the next most rigorous level of advanced courses or program offered by the high school that aligns with the student's high school and beyond plan goals.
    b. Each school district may include additional eligibility criteria for students to participate in the academic acceleration policy so long as the district criteria does not create inequities among student groups in the advanced course or program.
3.
    a. The subject matter of the advanced courses or program in which a student is automatically enrolled depends on the content area or areas of the assessments where the student has met or exceeded the state standard under subsection (2) of this section.
    b. Students who meet or exceed the state standard on the English language arts statewide student assessment are eligible for enrollment in advanced courses in English, social studies, humanities, and other related subjects.
    c. Students who meet or exceed the state standard on the mathematics statewide student assessment are eligible for enrollment in advanced courses in mathematics.
    d. Beginning in the 2021-22 school year, students who meet or exceed the state standard on the Washington comprehensive assessment of science are eligible for enrollment in advanced courses in science.
4.
    a. Students who successfully complete an advanced course in accordance with subsection (3) of this section are then enrolled in the next most rigorous level of advanced course that aligns with the student's high school and beyond plan.
    b. Students who successfully complete the advanced course in accordance with this subsection are then enrolled in the next most rigorous level of advanced course with the objective that students will eventually be automatically enrolled in courses that offer the opportunity to earn dual credit for high school and college.
    c. The district must notify students and parents or guardians regarding the academic acceleration policy and the advanced courses or programs available to students, including dual credit courses or programs.
    d. The district must provide a parent or guardian of a high school student with an opportunity to opt the student out of the academic acceleration policy and enroll the student in an alternative course or program that aligns with the student's high school and beyond plan goals.

Section A3. Examples of Advanced Courses by Subject

Subject	Advanced courses
ELA	• AP English Language and Composition, AP English Literature and Composition • IB English A, IB Language A: Literature, IB Language A: Language and Literature • CI English Language, CI English Language and Literature, CI English Literature • Various College in the High School courses, such as College Writing, World Literature, American Literature and Composition • Various Running Start courses, such as RS English Composition I/II, RS English 101
Social studies	• AP United States History, AP United States Government and Politics, AP Psychology, AP Comparative Government and Politics, AP Macroeconomics, AP Microeconomics, AP Human Geography, AP World History, AP European History • IB History of the Americas, IB Psychology, IB Theory of Knowledge, IB Anthropology, IB Economics • CI International US History, CI Economics, CI International History • Various College in the High School courses, such as Government & Law, International Issues • Various Running Start courses, such as U.S. History, Government, Psychology, Sociology
Math	• AP Calculus AB, AP Calculus BC, AP Statistics • IB Mathematics, IB Precalculus, IB Calculus • CI Mathematics, CI Calculus, CI Calculus/Mechanics • Various College in the High School courses, such as Precalculus, Calculus, Statistics • Various Running Start courses, such as Precalculus, Calculus
Any	*All of the above plus* • AP Biology, AP Chemistry, AP Environmental Science A, AP Environmental Science B, AP Physics 1, AP Physics 2, AP Physics B, AP Physics C, AP Computer Science Principles, AP Computer Science A, AP French Language and Culture, AP Spanish Language and Culture, AP Studio Art: 2D Design Portfolio, AP Studio Art: Drawing Portfolio, AP Music Theory • IB Biology, IB Chemistry, IB Physics, IB Environmental Systems, IB Marine Sciences, IB Spanish, IB French, IB Visual Arts, IB Business and Management, IB Film, IB Computer Science • CI Biology, CI Physics, CI Chemistry, CI Spanish, CI French, CI Graphic Design • Various College in the High School courses, such as Chemistry, Physics, Anatomy & Physiology, Oceanography, Spanish, Criminal Justice, Business & Marketing • Various Running Start courses, such as Biology, Chemistry, Environmental Science • Uncharacterized College in the High School and Running Start courses

Note. AP = Advanced Placement, IB = International Baccalaureate, CI = Cambridge International. Lists of courses are not exhaustive but represent the most common advanced courses in each subject. College in the High School courses and course titles are more varied than AP, IB, and CI offerings. Some College in the High School course titles cannot clearly identify the subject, and many Running Start course titles do not indicate the course subject but indicate only that a student is enrolled in a Running Start course off campus. In these cases, courses are considered uncharacterized and are included in the analyses of any advanced course enrollment but not in the subject-specific analyses.