# Effects of the California High School Exit Exam on Student Persistence, Achievement, and Graduation 

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Policy Brief 09-3

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"In order to significantly improve pupil achievement in high school and to ensure that pupils who graduate from high school can demonstrate grade level competency in reading, writing, and mathematics, the state must set higher standards for high school graduation." California Senate Bill 2X, Section 1 (b), March 29, 1999

Five years ago, California joined the growing number of states requiring an exit exam for high school graduation. Beginning with the class of 2006, students in California are required to pass the California High School Exit Exam (CAHSEE) to receive a diploma. In implementing a high school exit exam, the California legislature stated that students must be held accountable for meeting the state's achievement standards. Exit exam scores also are utilized as part of the formula to determine whether high schools in California meet Adequate Yearly Progress requirements under the No Child Left Behind Act.

Questions remain about whether exit exams meet their intended goals, particularly the goal of raising student achievement among low-performing students. This policy brief summarizes the results from a study of four large California school districts to evaluate the effects of the CAHSEE requirement on student outcomes. We compare persistence in high school, academic achievement, and graduation rates of students scheduled to graduate in 2005 - who were not subject to the CAHSEE requirement - to similar students in two later cohorts, who were subject to the requirement.

## Executive Summary

In this policy brief Sean Reardon and Michal Kurlaender summarize the findings from a study investigating the impact of the California High School Exit Exam (CAHSEE) on California's lowest performing students. Utilizing longitudinal data from four large urban school districts, the authors compare students scheduled to graduate just before (2005) and after (2006-07) the exit exam became a requirement for graduation from California high schools.

They find that the CAHSEE requirement has had no positive effects on students' academic skills. Students subject to the CAHSEE require-ment-particularly low-achieving students whom the CAHSEE might have motivated to work harder in school-learned no more between 10th and 11th grade than similar students in the previous cohort who were not subject to the requirement.

They also find that the introduction of the CAHSEE requirement had a large negative impact on graduation rates for students in the bottom quartile of achievement, and that this impact was especially large for minority students and for girls. On average, graduation rates were 19 percentage points lower among bottom-quartile female students who were subject to the CAHSEE requirement, but only 12 points lower among male students. The graduation rate for minority continued on page 2

## Executive Summary continued

students in the bottom achievement quartile declined by 15 to 19 percentage points after the introduction of the exit exam requirement, while the graduation rate for similar white students declined by only 1 percentage point. The analyses further suggest that the disproportionate effects of the CAHSEE requirement on graduation rates are due to large racial and gender differences in CAHSEE passing rates among students with the same level of achievement.

Given that the CAHSEE has not met its intended goal of raising student achievement to meet the state's grade-level standards, and that it appears to have disproportionately negative effects for female and minority students, the authors conclude that policymakers should reevaluate the utility of the CAHSEE in California's accountability system.

We begin by reviewing the intended goals of high school exit exams and existing research on their effects on student outcomes. We then present the study objectives, our analytic strategy, and our main findings. Finally, we discuss important implications from the results of this study and offer a set of policy recommendations.

## Background

Today, nearly half of all states require students to pass an exam in order to graduate from high school with a diploma. Such high stakes exams vary among states in their content and difficulty. Educators, policymakers, and scholars disagree about how such exams might
influence student and school behaviors. On the one hand, some argue that a high school exit exam requirement will create incentives for schools to provide better instruction and for struggling students to work harder and learn needed skills before graduation. Supporters of exit exams also argue that such a requirement creates a common standard for high school graduation, making the diploma a clearer signal to employers about the academic skills of potential employees. On the other hand, some claim that exit exam requirements discourage some students (in particular, academically or socially disadvantaged students) from staying in school, which may lead to higher dropout rates and greater educational inequality.

Prior research on the effects of exit exams has been far from conclusive on these points. Most, but not all, studies have found that state high school exit exam requirements reduce high school graduation rates, particularly among low-achieving and disadvantaged students. ${ }^{1}$ The most methodologically rigorous recent studies have found that high school graduation rates decrease by roughly 1 to 2 percentage points, on average, when states implement rigorous exit exams (Dee \& Jacob, 2006; Warren et al., 2006). These effects tend to be concentrated among black students and students in high-poverty schools. There is little prior evidence, however, on whether high school exit exam requirements lead to improved student achievement.

## Study Approach

The goals of this study are to evaluate the effects of the CAHSEE requirement on three student outcomes: persistence (whether students stay in
school through 11th and 12th grade), achievement (11th grade test scores), and graduation rates.

We use longitudinal student-level data from four of California's largest school districts, which collectively enroll roughly 110,000 high school students. Our analyses utilize data from three cohorts of students: those scheduled to graduate in 2005, 2006, and 2007. To investigate the effects of the exit exam requirement, we compare the average outcomes (persistence, achievement, and graduation) of students who were scheduled to graduate in 2005 and not subject to the CAHSEE graduation requirement with similar students in the following two cohorts who were subject to the CAHSEE requirement. We compare students with similar 8th, 9th, and 10th grade California Standards Test (CST) scores and similar demographic characteristics: gender, race or ethnicity, English Learner (EL) status, and free or reduced-price lunch eligibility. In particular, we focus on differences in outcomes among students in the bottom two quartiles of prior academic achievement as measured by students' 10th grade English Language Arts (ELA) scores on the California Standards Test (CST). We also investigate whether the CAHSEE policy has had a disproportionate effect on students of different race/ethnicity, gender, poverty status, and EL status.

We conduct one additional test to investigate the possibility that any differences in outcomes between the cohorts subject and not subject to the CAHSEE may result from something other than the CAHSEE requirement. For this test, we take advantage of the fact that students in the graduating class of 2005 took the

FIGURE 1 12th Grade Persistence Rates, by Cohort and 10th Grade ELA CST Percentile


FIGURE 2 11th Grade ELA CST Scores, by Cohort and 10th Grade ELA CST Percentile


CAHSEE exam in 10th grade (in spring 2003) in the belief that passing CAHSEE was a requirement for graduation, just as the classes of 2006 and 2007 would subsequently do. In the summer of 2003, however, the state decided to delay the requirement that students pass the CAHSEE until the class of 2006.

This policy change allows us to compare trends in student outcomes for students who passed the CAHSEE in 10th grade with those for students who failed the CAHSEE in 10th grade across our three cohorts of students. If the observed trends are due to something other than the CAHSEE, we would expect them to be the same for students who passed and students who failed. If the trends are due to the CAHSEE requirement, however, we would expect to observe differences in outcomes between cohorts only for students who failed the exam in 10th grade, because the CAHSEE has no effect on incentives to work harder or less hard for students who pass it on their first attempt. This test allows us to determine whether any changes that we observe in student outcomes can be attributed to the CAHSEE requirement.

## Main Findings

## Persistence Rates

Low-achieving students subject to the CAHSEE requirement had slightly lower rates of persistence in high school (as measured by the percentage of students remaining in school in their original district) relative to similar students not subject to the requirement. ${ }^{2}$ This is illustrated in Figure 1, which shows average persistence rates through 12th grade (plotted on the $y$-axis) as a function of students' statewide rank on the 10th grade ELA CST test (plotted on the x-axis). For ease of interpretation, we use CST percentile rankings as opposed to raw scores on the test metric. Although the patterns in Figure 1 are not adjusted for student's prior test scores or demographic characteristics, the patterns are substantively similar when we include the full set of control variables in a regression model. In particular, our regression models indicate that, on average, persistence rates through 11th grade were 2 percentage points lower among bottom-quartile students and 1 percentage point lower among second quartile students who were subject to the CAHSEE requirement than among similar students who were not. Persistence rates through 12th grade were 4 percentage points lower among bottom-quartile
students and 2 percentage points lower among second quartile students who were subject to the CAHSEE requirement than among those who were not. There were no significant differences in persistence rates among students in the upper achievement quartiles.

Despite the fact that there are modest differences evident in persistence between the cohorts of students subject and not subject to the CAHSEE requirement, the results from our final set of analyses show that persistence rates among lowachieving students declined even for those who passed the CAHSEE in 10th grade, suggesting that we cannot be sure that these differences are attributable to the CAHSEE requirement.

## Achievement Differences

There is no evidence that students subject to the CAHSEE requirement learned more between 10th and 11th grade than those who were not subject to the requirement. On average, scores on the 11th grade ELA CST test (the ELA test that all students take for school accountability purposes) were slightly lower among students subject to the CAHSEE requirement than among similar students not subject to the requirement (see Figure 2). Again, we cannot be certain

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this decline is a result of the CAHSEE requirement, because we observe the same decline among those who passed and failed the CAHSEE exam in 10th grade. Still, there is no evidence that the CAHSEE requirement improved performance on 11th grade ELA CST tests.

## Graduation Rates

Low-achieving students subject to the CAHSEE requirement have substantially lower graduation rates than similar students not subject to the CAHSEE (see Figure 3). On average, graduation rates (the percentage of students receiving a diploma on time from their original district) were 15 percentage points lower among bottom-quartile students and 3 percentage points lower among second quartile students who were subject to the CAHSEE requirement than among similar students who were not. In the cohort of students not subject to the requirement, a typical student in the bottom quartile of 10th grade achievement had a roughly 50 percent probability of graduating from his or her original district. In the cohorts subject to the requirement, the same student had a 35 percent probability of graduation. We estimate that the CAHSEE requirement caused at least 11 percentage points of the decline in graduation rates, and perhaps as much as 15 percentage points. These figures imply that roughly $3.6-4.5$ percent of California high school students (roughly 18,000-22,500 students per year) do not graduate as a result of the high school exit exam policy.

Differential Impacts of the CAHSEE Requirement

The negative effects of the CAHSEE requirement on graduation rates fall

FIGURE 3 Graduation Rates, by Cohort and 10th Grade ELA CST Percentile

disproportionately on minority students and female students. These differential impacts are evident even when we control for students' achievement on 8th, 9th, and 10th grade math and reading tests and students' demographic characteristics (free/reduced-price lunch eligibility and EL status). Among students in the lowest quartile of achievement, the CAHSEE requirement has no effect on the graduation rate of white students, but it has a large negative effect on graduation rates of black, Hispanic, and Asian
students. On average, among students in the bottom quartile of achievement, graduation rates were 19 percentage points lower among black students, 15 points lower among Hispanic students, and 18 points lower among Asian students who were subject to the CAHSEE requirement than among similar students not subject to the requirement (see Figure 4). Likewise, graduation rates were 19 percentage points lower among bottomquartile female students, but only 12 points lower among male students who

FIGURE 4 Percentage of Bottom Quartile Students Graduating, by CAHSEE Requirement


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\text { Class of } 2005 \text { (Pre-CAHSEE) } \quad \text { Classes of } 2006 \text { \& } 2007 \text { (Post-CAHSEE) }
$$

[^0]were subject to the CAHSEE requirement than among similar students not subject to the requirement.

There are no significant differences in CAHSEE effects on any of our three outcomes (persistence, achievement, and graduation) when comparing English Learners with non-English Learners, controlling for race/ethnicity, gender, free/reduced-price lunch eligibility and prior academic achievement. Similarly, we find no significant differences in CAHSEE effects when comparing students with and without free/reducedprice lunch eligibility, controlling for race/ethnicity, gender, EL status, and prior academic achievement. It is also important to note that we do not find significant differences by race/ethnicity or gender for other outcomes (i.e., achievement and persistence in the 11th and 12 th grade years). Finally, our findings reveal no sizeable differences among the four districts.

## Investigating the Differential Effects by Race and Gender

We explore several plausible explanations for the differential effect of the CAHSEE requirement on graduation rates by race/ethnicity and gender. First, we ask whether the race/ethnic differences in effects may be due to differences in the racial and ethnic makeup of schools and their relative effectiveness at ensuring that students with low academic skills in 10th grade pass the CAHSEE and graduate. Our analyses do not support this proposition. Large racial/ethnic differences in the effects of the CAHSEE are evident even when we compare students within the same schools, suggesting that it is not differences in school quality that primarily account for the
racial/ethnic differences in the effects of the CAHSEE. Moreover, school effects would not explain the differential effects by gender.

Our analyses suggest that the disproportionate effects of the CAHSEE requirement on graduation rates appear to be due to large racial and gender differences in CAHSEE passing rates among students with the same prior and current levels of achievement. Minority students perform less well on the CAHSEE exam in 10th grade than do white students with the same level of academic achievement as measured by 8th, 9th, and 10th grade performance on the California Standards Tests. Female students perform less well on the math CAHSEE test than do boys with the same level of academic achievement.

The reasons for this underperformance by minority students and female students are not clear, however. The developers of the test find no evidence of bias in the test itself. Differential item functioning tests were used to identify items that minority or female students answered correctly less often than white or male students with the same level of skill as measured by all other items on the test, and such items were eliminated (Wise et al., 2000). It may be that minority students and female students experience more stress or anxiety in high-stakes testing situations than do white and male students, but our data do not allow us to directly test this hypothesis.

## Limitations

There are some important limitations to our study. First, although our sample includes four of California's largest school districts, it is not representative of the state. It is quite possible that the
exit exam has different effects in more suburban or rural settings. Our results are, however, consistent with statewide trends: throughout California, graduation rates declined by 4 percent from the class of 2005 to the class of 2006, while we estimate that 3.6-4.5 percent of students in a cohort fail to graduate as a result of the CAHSEE exam.

Second, our study captures the effect of the exit exam in the first two years after CAHSEE was implemented. It is possible that CAHSEE effects have changed as students and districts have grown more familiar with the policy and the exam. It is also possible that other factors have changed in California during the time period we observe that may also have affected the graduation rates of lowachieving students independently of the CAHSEE requirement. Such factors, however, would have to specifically affect minority students who fail the CAHSEE exam but not those who pass it. Given the specificity of the patterns we observe, the CAHSEE requirement is the most likely cause of the changes in graduation rates between the classes of 2005 and 2006.

## Summary \& Implications

The stated rationale for the CAHSEE exam is the desire to make sure that California students are held to "high standards," in order to ensure that students have "competency in reading, writing, and mathematics," (California Senate Bill 2X, 1999). Few would disagree with this goal. But the real test of a policy should not be its stated intention, but the evidence of its effectiveness at achieving that intention. When held to that standard, the CAHSEE policy appears to have failed, at least for the first cohorts who were subject to it.

Our results show that among students with low academic achievement, the CAHSEE requirement has had no positive effects (and likely a negative effect) on students' academic skills. Moreover, the requirement has had a large negative impact on graduation rates. The negative effect of the CAHSEE requirement on graduation falls disproportionally on minority students and on female students. Our estimates suggest that 3.6-4.5 percent of all high school students fail to receive a diploma as a result of the exit exam requirement. Given enrollments of roughly 500,000 10th grade students per cohort in California, this implies that there are between 18,000 and 22,500 students per year who fail to receive diplomas who would have received them had the exit exam not been required. The great majority of the students who fail to receive a diploma as a result of the exit exam are students of color. In addition, the negative effect of the exit exam on graduation rates was almost twice as large for girls as for boys. These differential effects are particularly troubling.

Our findings raise important questions about the usefulness of exit exams as a method to improve student outcomes. If the goal of high school exit exams is to improve the academic performance of low-achieving students, there is no evidence the California high school exit exam has succeeded in this, at least for the first two cohorts subject to the exam. If however, the goal of the high school exit exam is to ensure that a high school diploma means something - that it signals to potential employers that graduates have a certain level of basic skills - then reducing the number of students receiving diplomas, at least in the short term,
may be a necessary by-product of such a policy. In order to accept this rationale, however, it is essential that the exit exam provide an unbiased signal of students' skills, regardless of their race or gender. If it takes a higher level of skill for minority and female students to pass a test than it does for white and male students (as our analyses suggest), then the test cannot be said to convey a fair signal of students' levels of basic skills.

This study provides no evidence that the CAHSEE exam policy as currently implemented has any benefits for students. It does not serve students well, and it appears to have sharply inequitable effects. Moreover, California, like the 20-plus other states with exit exam policies, spends millions of dollars and a considerable amount of instructional time on exit exam test preparation, administration, and remediation. Our analysis suggests that, to date, this has been neither money nor time well spent.

## Policy Recommendations

- Revaluate the utility of the high school exit exam as part of California's accountability system

The results from our analysis suggest that the CAHSEE has not met its intended goal of raising student achievement to meet the state's grade-level standards. Moreover, the disproportionate negative effects on female and minority students suggest that CAHSEE's assessment of basic skills is not a fair one. If exit exam policies like California's are to be retained, it is imperative that they be accompanied by serious efforts to improve student achievement and to ameliorate their disproportionately negative effects on minority students and girls.

## ■ Target Resources Early

The state should target resources toward improving low-achieving students' academic skills prior to the 10th grade. Previous work in these districts and elsewhere has demonstrated that students' performance in middle school (and even earlier) is a strong predictor of CAHSEE passing rates (see Kurlaender, Reardon and Jackson, 2008; Zau and Betts, 2008). It would therefore be sensible to allow districts to utilize CAHSEE remediation funds for earlier intervention. In particular, a compensatory allocation of resources (such as these remediation funds) toward minority and female students at risk of failing CAHSEE is necessary to address existing gaps in initial passing rates. The state can allocate funds to support promising interventions aimed at improving CAHSEE performance for minority and female students.

- Set aside a small portion of the CAHSEE funds for evaluating interventions targeted at improving success of low-achieving students on the CAHSEE

We know racial/ethnic and gender gaps in CAHSEE outcomes exist, even controlling for prior and contemporaneous academic skill, but we don't know what works to reduce such gaps. It is critical to set aside a small part of the CAHSEE funds for evaluating interventions targeted at improving success for lowachieving students on the CAHSEE. Thus, both innovation in interventions and evaluation of such interventions is needed to realize the state's ultimate goal of raising all students' academic skills.

## About CAHSEE

In March 1999, the California State Legislature passed Senate Bill 2 X , requiring all school districts to administer a high school exit exam and provide supplemental instruction to those students who do not demonstrate sufficient progress toward passing the exam. The CAHSEE is a two-part examination of mathematics and English Language Arts (ELA) skills. The math section assesses students' mastery of the California math content standards for sixth and seventh grade and their Algebra I skills using a multiple-choice format. The ELA section is aligned with state content standards through grade 10 and utilizes a multiple-choice format and an essay. Both the math and ELA sections are scored on a scale from 275 to 450 , and students must score at least 350 points on each part to pass the exam and earn a high school diploma. The test is first administered to students in the spring of tenth grade, and students have at least five subsequent opportunities to retake the sections they do not pass (twice each in eleventh grade and twelfth grade, and at least once following the end of the twelfth grade school year). Because students are told their exact score, not simply whether they passed or failed, students who fail have some sense of how close they came to scoring the 350 points they need to meet the CAHSEE requirement.

Although some students who were scheduled to graduate prior to 2006 took the CAHSEE in 2001, 2002, and 2003 (as 10th graders), they were not required to pass the test to graduate. The first class for whom the CAHSEE requirement was binding was the graduating class of 2006, who first took the test in 10th grade, in spring 2004, at which time they knew it to be a graduation requirement. For additional background information about the CAHSEE see: The California High School Exit Exam Gets Real, EdSource (available at: http: //www.edsource. org/pub_CAHSEE2-06.html).

## Endnotes

1 Several studies using individual-level data from nationally representative samples (mostly from cohorts of students graduating high school in the early 1990s) found that state high school exit exams increase high school dropout rates among low-achieving students (Bishop \& Mane, 2001; Jacob, 2001) and among black males (Dee \& Jacob, 2006), though one similar study found no such effects (Warren \& Edwards, 2005). In contrast, a set of studies utilizing state data to examine the relationship between exit exam policies and state-level graduation rates provides mixed evidence, with some studies reporting negative associations between exit exam policies and graduation rates (Amrein \& Berliner, 2002; Marchant \& Paulson, 2005) and other reporting no association (Carnoy \& Loeb, 2002; Greene \& Winters, 2004; Warren \& Jenkins, 2005).
2 Although we cannot directly determine whether students have dropped out of high schoolbecause students who leave a given district prior to graduation may be dropouts or may have left and enrolled elsewhere - we can identify whether students are present in the district one and two years after first taking the CAHSEE. Because the CAHSEE requirement is unlikely to induce students to transfer among public school districts (they would be subject to the same requirement at any public school in the state), we interpret differences in persistence rates within districts as dropout effects.

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[^0]:    Source: Reardon et al (2009) Effects of the California High School Exit Exam on Student Persistence, Achievement, and Graduation

