Examining Racial (In)equity in School-Closure Patterns in California

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This study investigates racial disparities in school closures both within California and nationally. Findings highlight an alarming pattern: Schools enrolling higher proportions of Black students are at significantly increased risk of closure relative to those enrolling fewer Black students, a pattern that is more pronounced in California than elsewhere in the United States. This study also finds that conventional explanations for school closures—such as declining enrollments, poverty rates, and achievement differences—cannot fully account for why schools enrolling larger shares of Black students have greater odds of closure. These findings underscore that school closures in California and elsewhere reflect racial inequalities that require adequate policymaking to ensure equitable and fair school-closure proceedings.

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Introduction

California K–12 public schools are in an unprecedented enrollment crisis. Because of a decrease in birth rates, an upsurge of nontraditional education options, and a rapid resorting of the state's residential population, including a marked decline in the state population since 2019, many elementary, middle, and high schools across California are enrolling fewer students than ever before. Between 2007 and 2022, California saw enrollment in K–12 schools decrease by more than 390,000 students: a decline of more than 6 percent (California Department of Education, 2023). Additionally, because rising living costs are forcing more households to relocate out of state, enrollment rates are expected to decrease by another 524,000 students over the next 10 years (California Department of Finance, 2022). Since districts are mainly funded based on average daily attendance, declining enrollments have translated into funding shortfalls that have given rise to a prominent cost-cutting and district-realignment strategy: school closures.

Between 2012 and 2021, nearly 700 schools across the state were closed, resulting in roughly 167,000 students being displaced (Hahnel & Marchitello, 2023). The issue of school closures is not unique to California, though. Approximately 2 percent of U.S. schools close annually, translating into thousands of closures affecting nearly 100,000 children each year (Gallagher & Gold, 2017). For instance, Michigan experienced almost 250 middle and elementary school closures between 2006 and 2009 (Brummett, 2014). Similarly, from 2006 to 2012, districts across Ohio closed nearly 200 schools (Carlson & Lavertu, 2015). Undoubtedly, the decision to close a school is rarely an easy choice or a simple process, with calls to close schools, even as a means for enhancing educational opportunities or balancing budgets, frequently encountering fierce resistance from students, teachers, and community members alike, who often perceive such closures as a breach of trust and an infringement on their right to quality education in their local community (Ewing, 2018; Green, 2017).

A commonly raised objection that reflects and foregrounds the longstanding issue of racial inequality in U.S. education is that school closures disproportionately affect schools of color, particularly Black schools. Despite compelling anecdotal evidence and several high-profile cases of school closure that have garnered significant media attention (Bierbaum, 2021), the empirical literature about the racial dimensions of school closures is surprisingly limited (Duncan-Shippy, 2019; Tieken & Auldridge-Reveles, 2019). For example, is school closure, in fact, more common for schools that predominantly serve students of color compared with schools that enroll larger shares of White students? If so, are these elevated closure rates explained by common justifications for closure, such as poor achievement or declining enrollment, or by proxies or analogs for racial composition, such as urbanicity or perhaps charter status? This report seeks to fill this gap in the literature by drawing data from the universe of public schools and exploring racial disproportionality in patterns of school closure in California and nationwide.

Background

Justifications for School Closure

Closing a school involves complex considerations that can be divided into two broad areas: budgetary and enrollment justifications on the one hand and performance-related justifications on the other. Budgetary and enrollment reasons are typically related to financial constraints that lead a district to close underutilized schools. According to this reasoning, closing an underenrolled school is often seen as a viable option for reallocating resources and maximizing quality across schools. On the other hand, reasons based on academic achievement focus on student performance and the need to ensure that all students have access to schools that exceed minimum standards of quality. Schools that consistently fall below this standard, however measured, face potential closure.

Prior research has examined how these justifications have played out in districts across the country. For instance, in a study of a midsized urban district, Engberg et al. (2012) found that "financial distress" was a primary factor in closing schools. This district had been experiencing declining enrollment for several years, and to reduce costs and balance its budget, the district needed to close a substantial number of schools. In a study of school closures in Philadelphia in the 2000s, Good (2017) noted the enrollment pressures brought on by the expansion of charter schools—that is, traditional public schools facing declining enrollment due to charter schools enrolling students previously served by the traditional schools. By 2011, the Philadelphia school district's budget deficits pushed district leaders to confront significant underenrollment at several traditional public schools in the city. A year later, in 2012, enrollment losses and significant state funding cuts led to one sixth of district-operated schools being closed.

Justifications leading to school closures go beyond fiscal and enrollment issues. Academic achievement can also figure into these deliberations. The roots of this justification date back, in part, to the passing of the federal K–12 education legislation No Child Left Behind (NCLB) in 2001. Prompted by this legislation, districts nationwide began engaging more aggressively in punitive reforms to respond to "failing" schools. Schools with persistently low academic achievement could be met with seismic changes: charter refashioning, state takeover, administrative and staff restructuring, contracting with a different school district, or even closure. In the aftermath of NCLB's implementation in 2001, the threat of closure gained traction as a strategy for improving education outcomes in struggling schools. National trends indicate that school closures have increased since the turn of the 21st century (National Center for Education Statistics, 2021). By the end of the 2004 school year, 2,168 schools closed nationwide, an increase of 81.5 percent from the pre-NCLB academic year of 2000–01 (Green, 2017). The era of retributive whole-school accountability and market-based education pressures swept the country and left many empty buildings in its wake.

What Closures Mean for Students and Communities

The fierce debates that often accompany school-closure deliberations reveal firmly held beliefs across various stakeholders about the purported benefits or harms that closures may bring about. Yet there is a surprisingly limited amount of empirical research on the impacts of school closures on students and communities (de la Torre & Gwynne, 2009; Sunderman & Payne, 2009). Moreover, the evidence that does exist is inconclusive.

Most studies examining school closures' impacts on student-level outcomes have focused on academic achievement and have arrived at mixed conclusions. Engberg et al. (2012), examining an anonymous urban school district, and Brummett (2014), studying Michigan public schools, found no evidence that school closures affected student achievement. Similarly, other investigations examining school closures in Chicago and Washington, D.C., found little evidence that school closures affected academic performance among displaced students (de la Torre & Gwynne, 2009; Özek et al., 2012). In contrast, research conducted in New Orleans and Ohio found evidence that school closures increased the academic achievement of displaced students following closure (Bross et al., 2016; Carlson & Lavertu, 2015). At least one study has found negative effects, though. Gordon et al. (2018), examining school closures in Chicago, documented adverse effects on displaced students' math and reading achievement. Of the few studies that examined noncognitive and behavioral outcomes, Engberg et al. (2012) found that displaced students experienced elevated absenteeism rates during the year following closure. In contrast, Gordon and colleagues (2018) found no evidence that school closures affected suspension or absentee rates among displaced students.

Interestingly, recent research has indicated that one mechanism that may contribute to achievement impacts is the difference in quality between the closed school and the school that displaced students subsequently attend. This research has shown that school closures can result in increased academic success for uprooted learners if they enroll in new schools that are academically superior to the schools they previously attended. For instance, research conducted on elementary school closures in Chicago, Michigan, and Ohio reveals that students who attended higher performing schools than the closed schools they previously attended tended to have significantly higher academic gains in the years after closure (Brummett, 2014; Carlson & Lavertu, 2015; de la Torre & Gwynne, 2009). However, research has shown that the travel associated with attending a new school, regardless of its quality, can affect other outcomes of interest. For instance, Steinberg and McDonald (2019) found that students who were displaced because of closure had a higher number of absences and suspensions as the distance between their new school and home increased.

Notably, the effects of school closures on student outcomes are not limited to displaced students. Several studies have examined what is commonly called "spillover effects" concerning students attending the schools that receive displaced students. For example, Engberg et al. (2012) observed no detrimental impact on academic performance for students attending receiving schools; Gordon et al. (2018) noted short-term adverse effects lasting up to one year on the achievement levels of receiving-school students; and Brummet's (2014) findings indicated that adverse spillover effects persisted over multiple years, affecting the academic outcomes of those in receiving schools following a school closure. Furthermore, Brummet found that an increase in displaced students at a particular receiving school corresponded with negative effects on student achievement. Similarly, Steinberg and McDonald (2019) found that students' academic performance in receiving schools decreased when displaced students were a higher proportion of the student body at the receiving schools.

The research that has been done about community-level impacts has largely been qualitative and has focused on the social costs of school closures as well as community resistance and organizing efforts that take place. For example, Ewing (2018) examined large-scale school closures in Chicago's Bronzeville district following the demolition of public housing in the early to mid 2010s. Ewing's findings frame the importance of school in the social context of a neighborhood, arguing that schools are more than a place where students learn and teachers teach; they also operate as historical landmarks and identity-shaping institutions for communities. She coins the term "institutional mourning," which she defines as "the social and emotional experience undergone by individuals and communities facing the loss of a shared institution they are affiliated with … especially when those individuals or communities occupy a socially marginalized status that amplifies their reliance on the institution or its significance in their lives" (p. 127).

Others have researched community organizers' techniques and strategies to respond to and fend off closures within this context. For example, Syeed (2019) examined school closures that took place in Washington, D.C., in 2013 and determined that community organizers used "counterframes" in their organizing efforts by challenging arguments of inevitability, data drivenness, and political neutrality of school-closure proceedings, a finding echoed by Green (2017) in a study of how leaders in a Midwestern U.S. city reopened a high school that its district had decided to close. The motivation for these organizing efforts is rooted in equity concerns and closures' potential long-term impact on the community. The growing body of quantitative research that has examined community-level effects of school closures provides some evidence to support these concerns. For instance, Pearman and Greene (2022) drew national data on school closures and neighborhood conditions and found that school closures exacerbated gentrification in low-income Black communities. This finding suggests that shutting down schools not only affects the education landscape, as others have noted, but also serves as a representation of a broader geographical and racial restructuring within U.S. cities that may lead to the dispossession and displacement of Black communities.

In sum, these findings suggest that school-closure impacts and reactions are highly varied and far from settled in the literature. While it is true that such closures are often justified on educational grounds, either fiscal or achievement related, the impact they have on communities goes far beyond these narrow considerations. In particular, marginalized communities and those heavily reliant on their local schools can suffer significant social and emotional consequences because of closure. Given this reality, it is crucial to examine inequalities along racial lines when examining patterns of school closure. By doing so, scholars, practitioners, administrators, and policymakers can better understand how closures affect different populations and why certain groups may be disproportionately affected in ways that others are not. All told, it is clear that any discussion around school closure must consider the full range of factors at play—from economic realities to sociocultural dynamics—if we hope to arrive at solutions capable of addressing the many complexities of school closures.

The purpose of the current study is to examine patterns of school closure in California and across the U.S. and determine the extent to which these closures disproportionately affect schools of color. The following research questions guided this study:

1. Are school closures more likely to occur among schools that enroll higher shares of students of color?
2. Are potential elevated closure rates for schools that predominately serve students of color explained by observable differences across schools, including achievement levels, enrollment patterns, and socioeconomic characteristics?

Method

Data

This study merged several national data sets to examine racial disproportionality in school closures in California and nationwide. The study relied on the National Center for Educational Statistics' Common Core of Data from 2000 to 2018 to gather information on school closures and other school and district characteristics. This study also utilized school-level achievement statistics from the Educational Opportunity Project (EOP). Note that EOP provides achievement information for the subset of schools containing at least one grade level tested annually on state assessments (Grades 3 through 8) and is limited to 2008–16. Therefore, this study reports two sets of results: The first pertains to the universe of public schools in California and nationwide from 2000 to 2018, and the second pertains to the subset of schools in the EOP database, limited primarily to elementary and middle schools, spanning from 2008 to 2016, which allows for additional analyses of the extent to which achievement differences account for any observed racial disparities in school closures.

Primary Outcome of Interest

The National Center for Educational Statistics' Common Core of Data was used to gather information on school features, including operational codes that indicate whether a school was closed permanently in the preceding year. For analytical purposes, this study concentrated solely on the closures of traditional public schools while excluding vocational schools, special education institutions, and those classified as "other."

Independent Variable of Interest

The primary analysis examines the relationship between school closures and linear measures of school racial composition (i.e., percentage Black or percentage Latinx). These linear measures allow for an understanding of how closure rates change as the share of Black or Latinx students changes. Supplementary results are included in Appendix A that measure racial composition based on an indicator of "predominately minority-serving" status—that is, schools in which Black or Latinx students comprise the largest racial group at a school. In contrast to the linear measure of school racial composition, this threshold measure concerns the relative likelihood of closure for predominately minority-serving schools versus those that are not. Of note, substantive conclusions about the relationship between school closures and school racial composition are similar based on these alternative thresholds and measures. (See Appendices A and B.)

Covariates

As previously mentioned, school closures are typically justified by budgetary or achievement-related factors. Moreover, studies have shown that certain geographic locations and types of educational institutions are more susceptible to school closures than others. Accordingly, this study aims to investigate racial disproportionality in the occurrence of school closures before and after accounting for these factors. Specifically, this study seeks to determine if alternative explanations based on these factors can account for any disproportionate rates of closure observed among schools serving students of color.

For instance, prior research has shown that schools of choice, specifically charter schools, are more likely to close than traditional schools (Carlson & Lavertu, 2015; Farmer et al., 2020). Moreover, prior research has suggested that closures may be more likely to occur in urban areas (Carlson & Lavertu, 2015; Ewing & Green, 2022) and among elementary and middle schools that may have a higher likelihood of consolidation than high schools (Duncombe & Yinger, 2010). Consequently, this study controls for school-status indicators: charter status, urbanicity, and grade level. Additionally, school poverty is correlated with a host of factors that may contribute to a school's likelihood for closure, including per-pupil expenditures, teacher quality, age of facilities, and organizational leadership. Consequently, this study controls for school poverty as a global measure of school composition. Moreover, given that the presence of Asian American

students may vary systematically from that of White students in determining the factors, attitudes, and processes that lead to school closures (Nuamah, 2020), this study also controls for the percentage of students in each school who identify as Asian American.

Another common justification for school closure pertains to enrollment and enrollment trends—specifically, underenrolled schools or those that have experienced recent declines in enrollment are more likely to close than others (DeAngelis & Flanders, 2019). Therefore, this study controls for a school's average daily attendance and whether a school has experienced a drop in enrollment during the previous 3 years. Moreover, a broader set of factors at the district level may contribute to the likelihood that a given district is compelled to close schools. These factors, broadly defined as *district strain*, include per-pupil expenditures, poverty rates, the amount of school choice—operationalized as the percentage of district schools that are charters—total enrollment, and, as a proxy for teacher workload, average student–teacher ratios. Finally, prior research has suggested that school performance is a key driver of closure decisions. In particular, schools with poor achievement are more likely than others to face closure (Ewing & Green, 2021). This study, therefore, controls for average schoolwide achievement levels in math and English language arts (ELA) in the EOP subsample of schools.

Analytic Strategy

The study uses hazard models to investigate the association between school closures and a school's racial composition. Hazard models are suitable for analyzing censored data when the aim is to model the time until an event happens, as not all schools were closed within the study period. The model uses a discrete-time hazard model that estimates the probability, h_{it}, that a school was closed in year t, given that it was open in the preceding year, according to the following specification:

$$\eta_{it} = ln\left(\frac{h_{it}}{1 - h_{it}}\right) = \alpha_t + \beta ShareMinoritized_{it} + X_{it}B + \lambda$$

The intercepts α_t are specific to each year from 2000 to 2018. The model also includes a vector of time-varying characteristics, X_{it}, representing the groups of factors outlined in the previous section pertaining to school status, school composition, enrollment trends, achievement levels, and district strain. The unit of observation is the school year, and the model uses all observations from the baseline year and either the year of closure or 2018 (2016, for the EOP subsample), whichever comes first. State fixed effects, λ, control for state-level variations in school-closure policies. The coefficient of interest is that for $ShareMinoritized_{it}$, as it measures the likelihood of closure associated with a 10-percentage-point increase in the share of Black (or Latinx) students at the school.

Table 1. Means of Key Variables for Nonclosed and Closed Schools, 2000–18

	U.S. Schools		California Schools	
	Nonclosed	**Closed**	**Nonclosed**	**Closed**
School characteristics				
Percentage Black	0.15	0.27	0.07	0.14
	(0.25)	(0.35)	(0.11)	(0.22)
Percentage White	0.59	0.54	0.32	0.32
	(0.34)	(0.38)	(0.27)	(0.30)
Percentage Latinx	0.18	0.15	0.47	0.41
	(0.25)	(0.23)	(0.30)	(0.29)
Student–teacher ratio	16.63	16.15	22.43	19.45
	(113.22)	(29.96)	(34.89)	(8.19)
Percentage FRPL	0.48	0.57	0.54	0.54
	(0.28)	(0.29)	(0.30)	(0.32)
Total enrollment	551.80	239.48	725.89	296.07
	(443.77)	(278.18)	(581.41)	(322.46)
Declining enrollment	0.57	0.58	0.61	0.55
	(0.49)	(0.49)	(0.49)	(0.50)
Urban	0.26	0.33	0.40	0.40
	(0.44)	(0.47)	(0.49)	(0.49)
Charter	0.05	0.13	0.09	0.33
	(0.21)	(0.34)	(0.28)	(0.47)
Magnet	0.03	0.02	0.05	0.02
	(0.17)	(0.15)	(0.21)	(0.14)
Elementary	0.60	0.56	0.68	0.52
	(0.49)	(0.50)	(0.47)	(0.50)
Middle school	0.18	0.19	0.16	0.16
	(0.39)	(0.39)	(0.37)	(0.36)
High school	0.18	0.13	0.14	0.18
	(0.39)	(0.33)	(0.35)	(0.38)

Table continued on next page.

	U.S. Schools		California Schools	
	Nonclosed	**Closed**	**Nonclosed**	**Closed**
District characteristics				
Total enrollment	35,709.89	32,557.22	81,536.29	68,783.11
	(104,615.22)	(102,837.07)	(191,876.03)	(171,777.98)
Per-pupil expenditures	11,364.75	12,659.99	10,819.79	12,355.97
	(5,345.11)	(7,855.69)	(6,007.21)	(11,239.49)
Expanded school choice	0.05	0.06	0.09	0.10
	(0.21)	(0.24)	(0.29)	(0.30)
Avg. student–teacher ratio	16.00	15.72	22.00	20.96
	(22.06)	(15.83)	(6.39)	(3.76)
Percentage Black	0.15	0.23	0.07	0.09
	(0.35)	(0.29)	(0.07)	(0.10)
Percentage White	0.59	0.56	0.32	0.34
	(0.63)	(0.42)	(0.24)	(0.26)
Percentage Hispanic	0.18	0.16	0.47	0.42
	(0.26)	(0.21)	(0.25)	(0.24)
Percentage FRPL	0.46	0.53	0.53	0.53
	(1.16)	(0.23)	(0.24)	(0.22)
Observations =	1,278,342	11,937	123,299	848

Note. FRPL = free or reduced-price lunch. The first two columns refer to all U.S. schools. The second two columns refer to California schools. The first and third columns refer to nonclosed schools. The second and fourth columns refer to closed schools. Standard deviations are in parentheses.

Results

Descriptive Analysis

Table 1 presents a descriptive analysis of school closures nationwide and in California between 2000 and 2018. The first two columns refer to U.S. schools. The second two columns refer to schools in California. The odd columns refer to schools that remained open. The even columns refer to schools that closed. First, when considering U.S. schools in general, schools that closed compared with those that remained open were generally more socioeconomically disadvantaged and enrolled higher shares of Black students and fewer White students. Compared with schools that remained open, schools that closed had free-and-reduced-price lunch rates that were 9 percentage points higher, a share of Black students that was 12 percentage points higher, and a share of White students that was 5 percentage points lower. The average enrollment of closed schools was less than half of that of schools that remained open, and a slightly higher fraction of closed compared to open schools experienced recent declining enrollment.

Schools that closed were also more likely to be located in urban areas, were more likely to be charter schools, and were in districts that had higher poverty rates and higher concentrations of Black students. In California, patterns of school closures were similar to those observed nationwide, except that schools that closed were no more likely to be located in urban areas than schools that remained open. However, the most unique feature of California's school-closure landscape is that a much higher fraction of school closures that occurred in the state pertained to charter schools. In California, 33 percent of all school closures that took place between 2000 and 2018 were of charter schools. Nationwide, just 13 percent of school closures were of charter schools.

Race and School Closures

Figure 1 turns attention to the relationship between student race and school closures, depicting the association between closure rates and the percentage of Black and Latinx students, respectively, in schools, averaged across the observation period (2000–18). The blue lines refer to Black students; the red lines refer to Latinx students. The dotted lines represent Black and Latinx school populations in California schools, respectively, while the solid lines refer to the same nationwide. It can be observed that as the proportion of Black students increases, closure rates also rise, especially in California. As indicated by the dotted blue line, in schools where less than 20 percent of students are Black (located on the left side), a small number close—less than 1 percent. However, once half or more of the student body is composed of Black students, closure rates in California surpass 2.5 percent and exhibit a sharp incline thereafter. For instance, schools with more than 80 percent Black enrollment have about a 10 percent rate of closure—meaning one out of every ten predominantly Black schools close in California. Nationwide, as indicated by the solid blue line, a similar trend can be observed: Closure rates rise as the percentage of Black students in schools increases. However, this relationship is comparatively weaker than what is observed in California. Specifically, around 3.5 percent of predominantly Black schools (defined as those with a Black student population of more than 80 percent) are forced to close nationwide. This rate more than doubles within California's borders.

Figure 1. School-Closure Rates by School Racial Composition, 2000–18
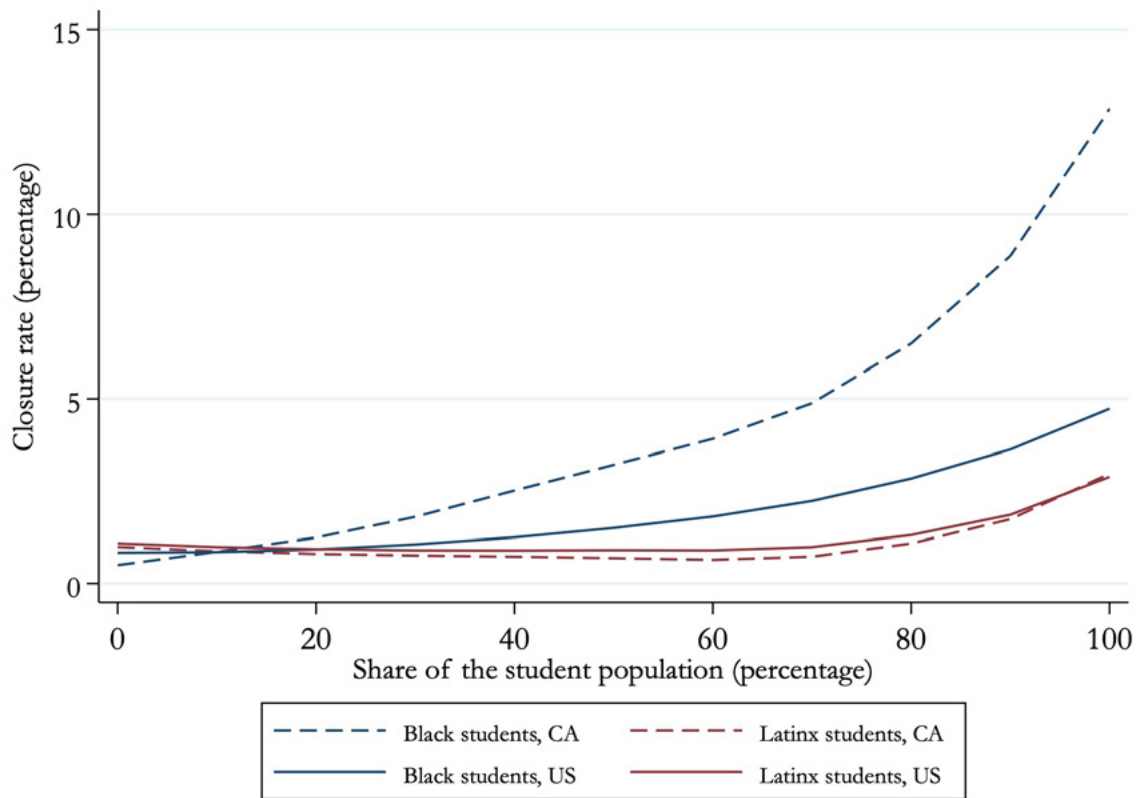
With regard to Latinx students, the red lines in Figure 1 indicate that closure rates only appear to be sensitive to Latinx composition once Latinx students make up around 80 percent of students at a given school, after which closure rates increase somewhat. Where around 1 percent of schools close that enroll a Latinx population anywhere between 0 percent and 80 percent, roughly 2.5 percent of schools close in which Latinx students predominate (where Latinx students make up 80 percent or more of the student population). In contrast to what was observed for Black students, rates of closure in California are no more sensitive to the share of students who are Latinx than what is observed nationally.

Figures 2 and 3 turn attention to the question of how rates of closure have shifted over time for schools that predominately serve students of color. For illustrative purposes, Figures 2 and 3 concentrate on schools where Black students (Figure 2) or Latinx students (Figure 3) are the predominant racial group—that is, the largest racial group based on percentages. The four lines in each figure differentiate between California versus nationwide schools and whether schools enroll a student population that is predominately Black or Latinx or not. The dotted lines refer exclusively to predominately Black or Latinx schools in California or nationwide; solid lines represent schools where Black or Latinx students do not predominate.

Figure 2. Percentage of Black and Non-Black Schools Closed Nationwide Versus California, 2000–18
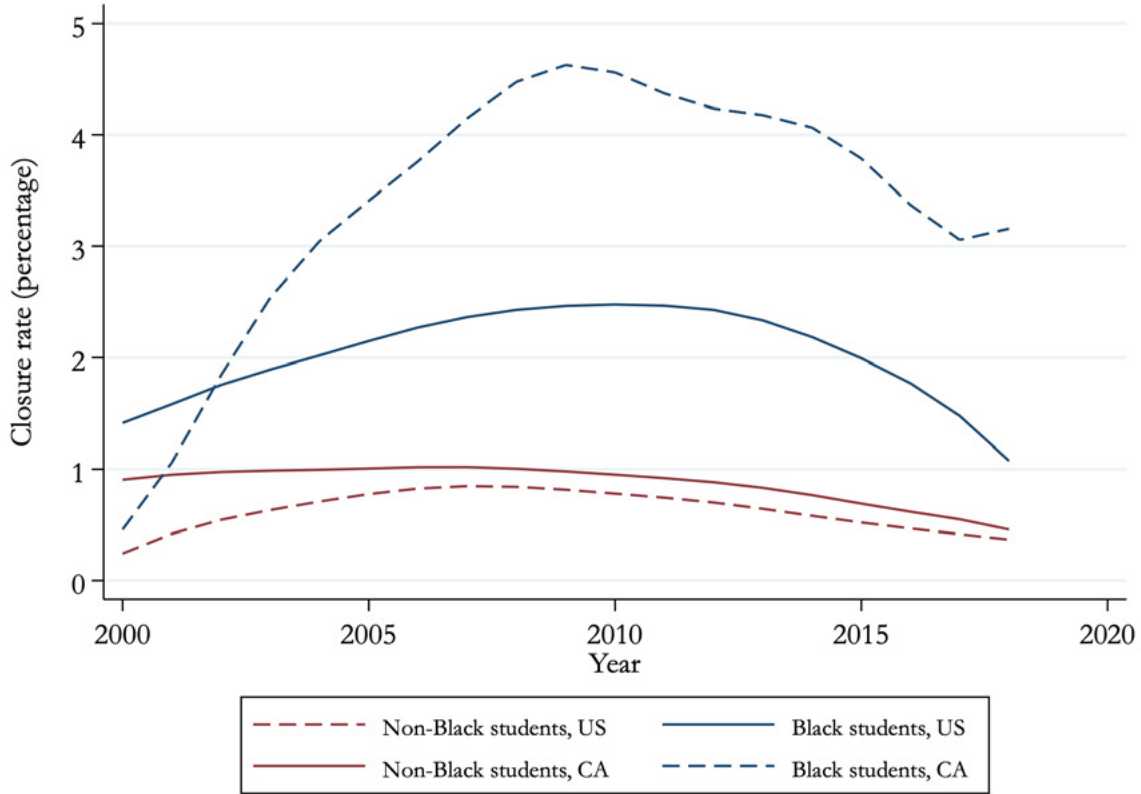
As shown in Figure 2, and as expected based on the previous figure, closure rates for predominately Black schools have been higher than those of nonpredominately Black schools since at least 2000 in California and nationwide. Moreover, closure rates of Black schools *in California* have consistently exceeded those of majority Black schools elsewhere. In terms of trends, closure rates of predominately Black schools in California were similar to, even slightly less than, predominately Black schools nationwide at the turn of the 21st century. However, closure rates of predominately Black schools in California rapidly increased in the early 2000s, peaking at around 4.5 percent in 2010, while closure rates of Black schools nationwide rose to less than half of that: 2.5 percent. Since 2010, closure rates of all schools, including predominately Black schools, have fallen slightly, with closure rates for majority Black schools in California falling to roughly 3 percent in 2018 compared to 1 percent for majority Black schools nationwide.

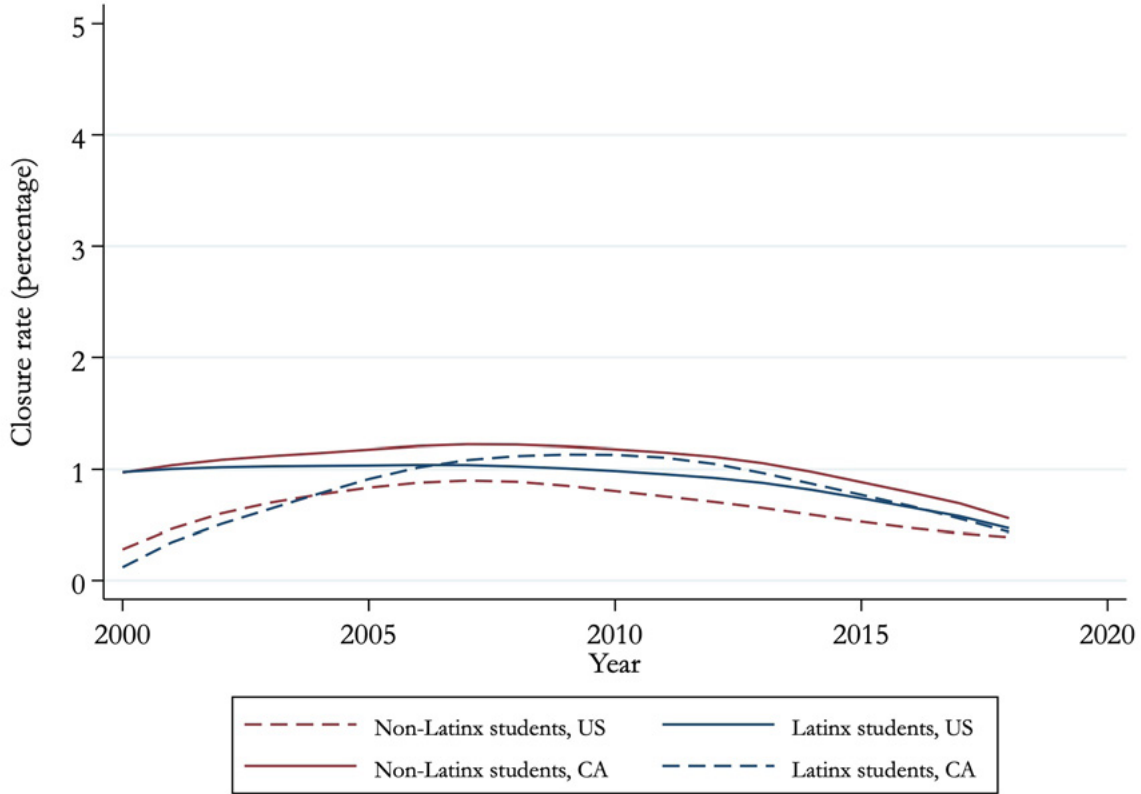**Figure 3.** Percentage of Latinx and Non-Latinx Schools Closed Nationwide Versus California, 2000–18

Figure 3 plots closure rates among schools based on their status as predominately Latinx. Figure 3 indicates minimal variation in school-closure rates between institutions that primarily serve Latinx students and those that do not and between those located in California compared with those nationwide. Notably, Figure 3 highlights the remarkable stability observed in school-closure rates over the past 20 years for schools, regardless of whether they primarily enroll Latinx students.

Multivariate Models

The next set of analyses focuses on whether conventionally understood reasons for school closures can explain racial disparities in closure rates. The following analysis scrutinizes how five categories—school status, composition, enrollment trends, broader district strain, and academic achievement levels—could account for racial disparities in closure rates.

Given the results from the previous section—specifically the lack of correlation between closure rates and the share of Latinx students—this section focuses on elevated closure rates

associated with Black students. Figures 4 and 5 plot the relative likelihood of closure associated with a 10-percentage-point increase in the share of students who are Black for the full sample and the EOP subsample, respectively. The y-axis is presented in terms of odds ratios. A value of 1 indicates that the likelihood of closure does not change as the share of students who are Black changes. Values greater than 1 indicate that higher concentrations of Black students are associated with a higher likelihood of closure. In contrast, values less than 1 indicate that higher concentrations of Black students are associated with a lower likelihood of closure. The green bars refer to schools in California. The gray bars are a reference point and refer to schools nationwide. The first set of bars presents unadjusted estimates, while subsequent sets add controls for the sets of factors displayed in the column name.

Figure 4. Relative Odds of Closure Associated With a 10-Percentage-Point Increase in the Share of Black Students, Full Sample
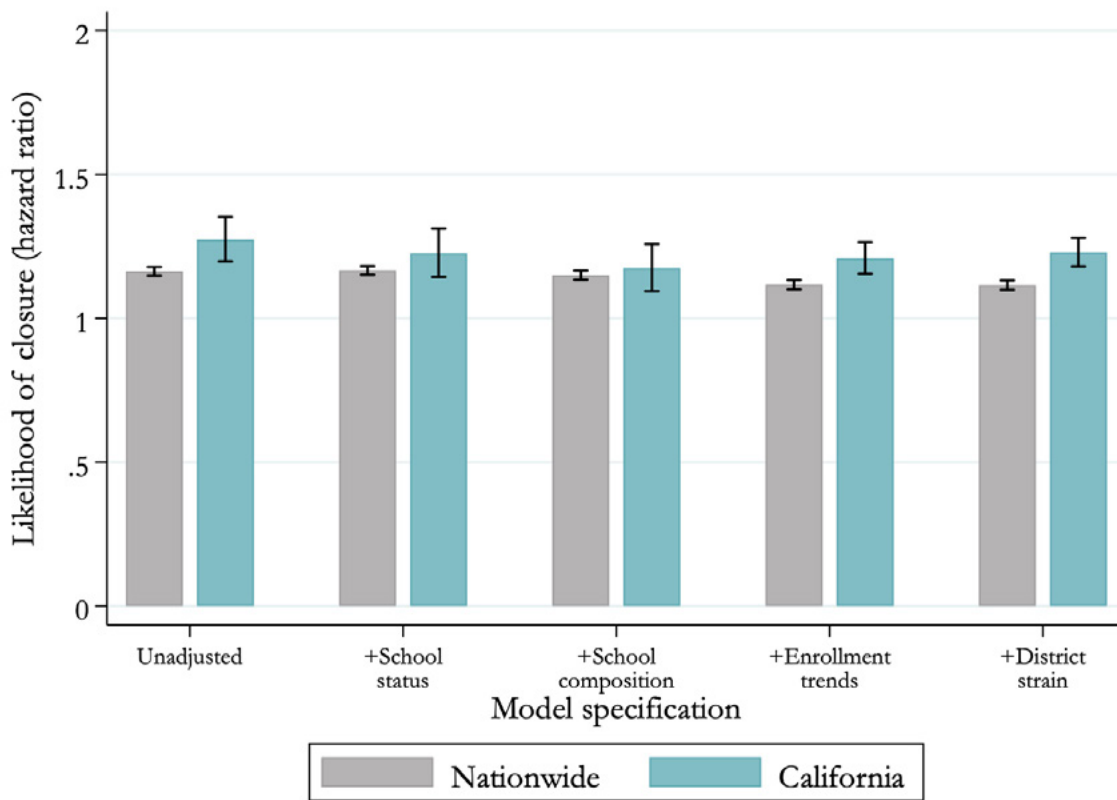
Figure 4 plots the relative likelihood of closure associated with a 10-percentage-point increase in the share of students who are Black. The y-axis is presented in terms of odds ratios. A value of 1 indicates that the likelihood of closure does not change as the share of students who are Black changes. Values greater than 1 indicate that higher concentrations of Black students are associated with a higher likelihood of closure. In contrast, values less than 1 indicate that higher

concentrations of Black students are associated with a lower likelihood of closure. The green bars refer to schools in California. The gray bars are a reference point and refer to schools nationwide. The first set of bars presents unadjusted estimates, while subsequent sets add controls for the factors shown in the column name.

The first set of columns in Figure 4 indicates that the likelihood of closure increases as the share of Black students increases. The magnitude of this disparity is notable, especially in California, with the odds of closure increasing by 27 percent for every 10-percentage-point increase in the Black student population ($p < .001$). Nationally, a 10-percentage-point increase in the share of Black students was associated with a 16 percent increase in the odds of closure ($p < .001$). The next set of bars adds school status controls, including charter and magnet status, grade span, and urbanicity. After accounting for these factors, a 10-percentage-point increase in the share of Black students in California was associated with a 23 percent increase in the likelihood of closure ($p < .001$). It is also worth noting that while differences in school status helped explain part of the elevated closure rates in California, these differences did not explain any disproportionate trends at the national level. In other words, differences in school status play a role in partially explaining why Black student enrollment increases closure rates in California but not, on average, elsewhere in the country.

The third set of bars in Figure 4 accounts for differences in school composition. After accounting for compositional and school status differences in California, a 10-percentage-point increase in the share of Black students was associated with a 17 percent increase in the odds of closure ($p < .001$). Nationwide, after accounting for differences in school status and composition, a 10-percentage-point increase in the share of Black students was associated with a 15 percent increase in the odds of closures ($p < .001$). Interestingly, after additionally accounting for school-level differences in enrollment and enrollment trends, as indicated by the fourth set of bars in Figure 4, the magnitude of the association between the likelihood of closure and the share of Black students in California increased slightly. However, enrollment and enrollment trends accounted for some of the association between closure rates and shares of Black students nationally. After accounting for differences in school status, composition, and enrollment trends, a 10-percentage-point increase in the share of Black students was associated with a 12 percent increase in the odds of closure ($p < .001$).

The final set of bars in Figure 4 accounts for differences in district-level strain, which includes per-pupil expenditures, total enrollment, student–teacher ratios, and the density of charter and magnet schools, all measured at the district level.[1] In California, a 10-percentage-point increase in the share of Black students is associated with a 23 percent increase in the odds

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[1] Appendix C reports results from models that include district fixed effects. Importantly, these estimates are shown only for California. Because of computational limitations, Cox proportional-hazards models were only able to converge when analyzing the subset of California schools. As shown in Appendix C, estimates based on models that include district fixed effects are virtually identical to those derived from models that include district strain variables.

of closure after accounting for the complete set of explanatory factors. Nationally, the odds of closure associated with a 10-percentage-point increase in the share of Black students increases by 12 percent after accounting for the full suite of explanatory variables.

Figure 5. Relative Odds of Closure Associated With a 10-Percentage-Point Increase in the Share of Black Students, EOP Subsample
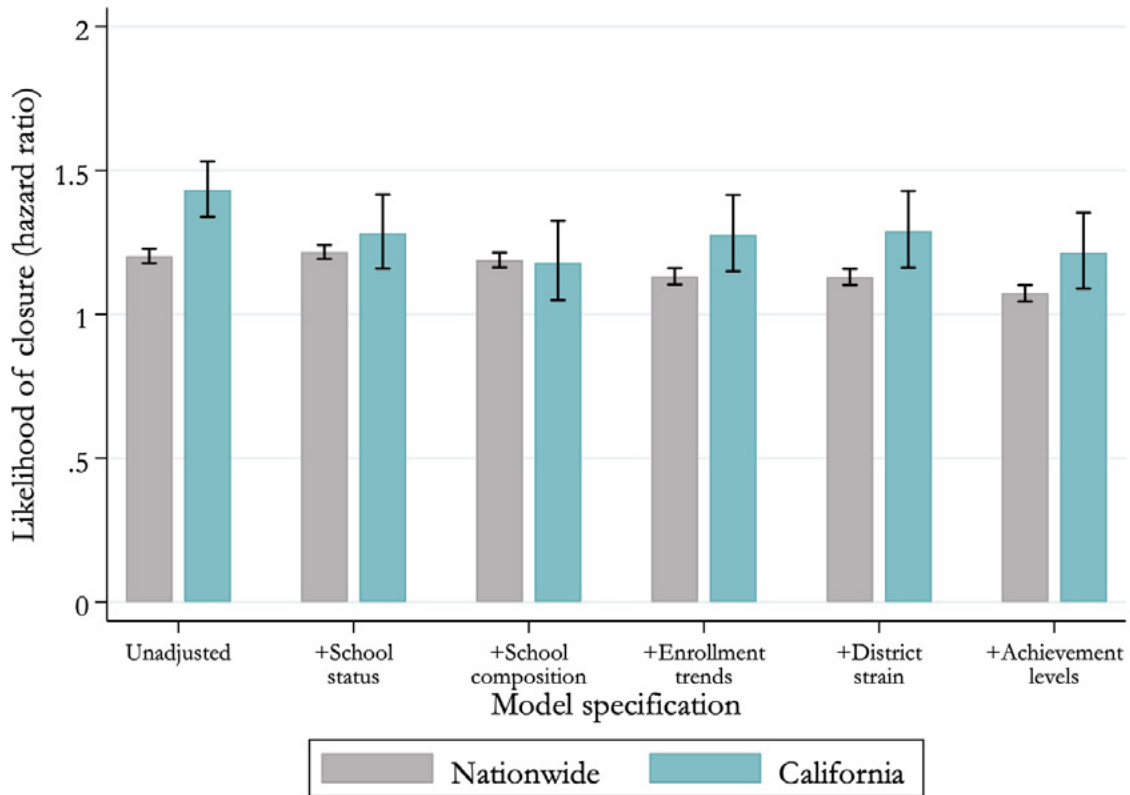

Figure 5 reports results from a parallel set of analyses using the EOP subsample, which encompasses every school in the U.S. that includes at least one grade level tested annually on state assessments (typically Grades 3–8). This means that virtually all elementary and middle schools in California and nationwide are included in the analysis. This sample is useful because a key question is the extent to which racial disparities in closure rates are accounted for by differences in school-level achievement, for which data are only available using this subsample of schools.

The first five sets of bars in Figure 5 report similar findings to those found in the full sample: In unadjusted models as well as in models accounting for differences in school status, composition, enrollment trends, and district strain, having a higher share of Black students enrolled is associated with higher odds of closure, in California and nationwide. The final set of bars in Figure 5 adds an additional control for achievement differences between schools. In California,

the relative odds that a school closes after accounting for achievement differences—in addition to differences in school status, composition, enrollment trends, and district strain—is 24 percent higher for every 10-percentage-point increase in the share of Black students. Nationally, after accounting for these differences, the odds that a school closes are 8 percent higher if the school enrolls 10 percentage points more Black students.

Discussion

The present study aimed to delve into two critical questions that have significant implications for racial equity within California's educational landscape. The first question examined whether schools enrolling higher proportions of students of color are at a higher risk of experiencing closures than their institutional counterparts. The second inquiry aimed to determine if conventional reasons for school closures could explain any disparities. The findings indicated a disturbing pattern: School closures are highly sensitive to Black student enrollment in California and nationally, even after controlling for a host of potential explanatory factors. As a school's share of Black students increases, so too does its likelihood of closure. Moreover, the strength of the association between Black student enrollment and school-closure rates in California far exceeded those observed nationwide. This striking disparity has gradually unfolded since the early 2000s, indicating long-standing systemic inequities in closure rates. It is worth noting that despite these sobering statistics, California has experienced a marginal decline in closure rates post-2010.

The finding that racial disparities in closure rates did not apply to Latinx students was intriguing and suggests that a more complex understanding of the mechanisms behind school closures is needed. This pattern highlights the need for critical analyses that delve deeper into anti-Blackness as a theoretical and analytical lens, particularly given the declining numbers of Black schools, residents, and communities in California's coastal and urban areas. This finding suggests that one cannot simply generalize about racial inequalities in closure rates but must consider specific racial groups, specifically Black students, within those larger categories. By adopting this nuanced approach, the research, practitioner, and policy communities can better understand how race intersects with other factors, such as socioeconomic status or geography, to affect the distribution of educational opportunities across geographies and the impact of school closures on them.

The study also sought to investigate potential reasons why Black student enrollment was so strongly predictive of a school's likelihood of closure, finding that even the factors most relevant to the school-closure process—factors commonly given to justify school closures—cannot fully explain why Black schools are so much more likely to close than others. In particular, this study analyzed the extent to which racial inequities in closure rates could be explained by school- and district-level factors commonly thought to contribute to school closures. Overall,

differences in school status, composition, enrollment trends, achievement levels, and district strain could not account fully for why schools that enroll higher shares of Black students close more frequently than their institutional peers. In California, for instance, when you consider schools that are otherwise equivalent in terms of charter status, achievement levels, urbanicity, poverty rates, and enrollment trends and that are situated in districts that are under the same level of strain in terms of per-pupil expenditures, total enrollment, and level of school choice, the odds of closure increase by nearly 25 percent for every 10-percentage-point increase in the share of Black students, an estimate that is highly robust to alternative specifications, including when only comparing schools within the same district (see Appendix C). In short, Black student enrollment is highly predictive of which schools close, especially in California.

Conclusion

The study's findings underscore the reality that school closures, in California and elsewhere, reflect longstanding racial inequities that have long plagued the U.S. educational system. The evidence provided is substantial and concerning, demonstrating that schools with higher concentrations of Black students are subject to considerably higher closure rates than schools with fewer Black students. Moreover, these disparities persist even after accounting for observable differences commonly attributed to school closure. Given these elevated closure rates, there is a pressing need to (a) conduct further research to understand the many factors contributing to this pattern, including in-depth analyses of how racial discrimination may play out in the discretionary decisions that guide school-closure proceedings; (b) examine the implications of school closures for students and their communities; and (c) suggest policies for ensuring that school-closure proceedings and the opportunities afforded to displaced students are equitable and fair. California's Assembly Bill 1912, which requires school districts receiving state aid to conduct an equity impact analysis before any decision about school closure can be made, is a step in the right direction, as is the state attorney general's new guidance underscoring that school-closure deliberations are also bound by state and federal antidiscrimination laws. Prioritizing fair education practices, especially concerning school closures, is critical to ensuring that all students have the necessary opportunities to succeed. Indeed, as the findings presented here make clear, the issue of school closures extends far beyond mere logistical or budgetary considerations; it is, at its core, a matter of racial equity.

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Appendix A

Table A1. Cox Hazard Models of the Likelihood of School Closure, Educational Opportunity Project Subsample, 2000–18

	U.S. Schools		California Schools	
	Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**
Panel A. Linear measure				
Percentage Black	1.17***	1.08***	1.45***	1.24***
	(0.01)	(0.01)	(0.04)	(0.05)
Panel B. Categorical measure				
Percentage Black	2.96***	1.48***	9.67***	2.41***
	(0.20)	(0.12)	(2.13)	(0.63)
Observations =	494,751	494,751	52,821	52,821

Note. This table reports results for Cox proportional-hazard models of the likelihood of school closure based on all schools. Coefficients are reported in terms of hazard ratios that are interpreted as the risk of closure corresponding to characteristics in the row name. "Predominately Black" is a binary indicator of whether Black students are the largest racial group at a school. Standard errors are clustered at the district level and are shown in parentheses.

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ for two-tailed tests of significance.

Appendix B

Table B1. Cox Hazard Models of the Likelihood of School Closure, All U.S. Schools, 2000–18

	U.S. Schools		California Schools	
	Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**
Panel A. Linear measure				
Percentage Black	1.13***	1.12***	1.27***	1.23***
	(0.01)	(0.01)	(0.04)	(0.03)
Panel B. Categorical measure				
Percentage Black	2.38***	1.75***	4.58***	2.78***
	(0.12)	(0.08)	(0.72)	(0.33)
Observations =	1,353,250	1,353,250	137,241	137,241

Note. This table reports results for Cox proportional-hazard models of the likelihood of school closure based on all schools. Coefficients are reported in terms of hazard ratios that are interpreted as the risk of closure corresponding to characteristics in the row name. "Predominately Black" is a binary indicator of whether Black students are the largest racial group at a school. Standard errors are clustered at the district level and are shown in parentheses.

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ for two-tailed tests of significance.

Appendix C

Table C1. Cox Hazard Models of the Likelihood of School Closure, 2000–18

	+ District-strain characteristics	+ District fixed effects
Percentage Black	1.24***	1.30***
	(0.05)	(0.07)
Observations =	52,821	52,821

Note. This table reports results for Cox proportional-hazard models of the likelihood of school closure. Coefficients are reported in terms of hazard ratios that are interpreted as the risk of closure corresponding to characteristic in the row name. Standard errors are clustered at the district level and are shown in parentheses.

*p < 0.05, **p < 0.01, ***p < 0.001 for two-tailed tests of significance.

Appendix D

Table D1. Means of Key Variables for Nonclosed and Closed Schools, 2009–16

	U.S. Schools		California Schools	
	Nonclosed	**Closed**	**Nonclosed**	**Closed**
School characteristics				
Avg. achievement	-0.01	-0.27	-0.24	-0.51
	(0.42)	(0.48)	(0.46)	(0.42)
Percentage Black	0.14	0.27	0.06	0.15
	(0.23)	(0.35)	(0.10)	(0.22)
Percentage White	0.57	0.53	0.28	0.28
	(0.33)	(0.38)	(0.26)	(0.27)
Percentage Latinx	0.21	0.14	0.51	0.46
	(0.26)	(0.22)	(0.30)	(0.29)
Percentage Asian American	0.04	0.02	0.10	0.06
	(0.08)	(0.05)	(0.14)	(0.09)
Percentage FRPL	0.52	0.63	0.58	0.64
	(0.27)	(0.26)	(0.30)	(0.27)
Total enrollment	494.54	268.71	589.74	321.51
	(280.24)	(183.48)	(310.01)	(266.19)
Declining enrollment	0.58	0.70	0.60	0.67
	(0.49)	(0.46)	(0.49)	(0.47)
Urban	0.24	0.30	0.41	0.41
	(0.43)	(0.46)	(0.49)	(0.49)
Charter	0.03	0.06	0.10	0.30
	(0.16)	(0.23)	(0.30)	(0.46)
Magnet	0.03	0.04	0.04	0.02
	(0.17)	(0.18)	(0.19)	(0.14)
Elementary	0.70	0.64	0.77	0.63
	(0.46)	(0.48)	(0.42)	(0.48)
Middle school	0.23	0.29	0.19	0.24
	(0.42)	(0.45)	(0.39)	(0.43)
High school	0.04	0.03	0.01	0.03
	(0.20)	(0.17)	(0.11)	(0.18)

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	U.S. Schools		California Schools	
	Nonclosed	**Closed**	**Nonclosed**	**Closed**
District characteristics				
Total enrollment	34.73	30.17	82.08	77.61
	(86.56)	(78.76)	(188.31)	(183.17)
Per-pupil expenditures	12.77	14.48	11.61	12.26
	(5.84)	(8.09)	(6.62)	(10.96)
Expanded school choice	0.04	0.06	0.09	0.07
	(0.21)	(0.23)	(0.29)	(0.26)
Avg. student–teacher ratio	16.07	15.42	23.19	22.60
	(5.08)	(4.06)	(9.52)	(4.50)
Percentage Black	0.14	0.23	0.06	0.08
	(0.47)	(0.28)	(0.07)	(0.08)
Percentage White	0.57	0.56	0.28	0.31
	(0.89)	(0.56)	(0.22)	(0.24)
Percentage Latinx	0.20	0.16	0.50	0.46
	(0.31)	(0.21)	(0.25)	(0.22)
Percentage FRPL	0.50	0.57	0.56	0.57
	(0.90)	(0.22)	(0.23)	(0.20)
Observations =	458,745	2,689	41,507	100

Note. FRPL = free or reduced-price lunch. Schools included in the national and California samples are those represented in the Education Opportunity Project national database. The first two columns refer to U.S. schools. The second two columns refer to California schools. The first and third columns refer to nonclosed schools. The second and fourth columns refer to closed schools. Standard deviations are in parenthesis.