Affirmative Action and Racial Integration*

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March 2026

Abstract

Does exposure to diverse college peers cause long-run racial integration? We first study California Proposition 209, which halved Black and Hispanic (URM) enrollment at many undergraduate and graduate University of California schools and improved cross-race academic match (without affecting net URM enrollment) at others. Time series and difference-in-difference designs show no effects of either shock on non-URM students' later-life local residential or public school composition, interracial marriage, or other measures of racial cohesion. Affirmative action only does not affect the patient racial composition of medical school graduates. We investigate mechanisms using complementary natural experiments produced by the UC Berkeley freshman housing lottery. URM roommate assignment has small effects on non-URM students' long-run racial integration only if the roommates are academically well-matched. Effects on URM students are larger. A currently-in-the-field survey will measure a suite of additional integration outcomes. We conclude that collegiate interracial contact is only a second-order determinant of U.S. racial integration, and only through its effects on minority students.

JEL Codes: I23, J15, R23

*Thanks to Ian Ayres, Leah Boustan, Susan Dynarski, Josh Kalla, Ilyana Kuziemko, Gary Orfield, Sahar Parsa, Claude Steele, Winnie van Dijk, and many seminar participants for helpful comments, to Dylan Black and David Bodovski for excellent research assistance, and to Ed Freeland, Naila Rahman, and Jesse Rothstein for valuable survey support. The conclusions of this research do not necessarily reflect the opinion or official position of the University of California. Any errors that remain are our own.

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1 Introduction

Many public and private U.S. educational institutions have implemented race-based school integration policies over the past 75 years. One common motivation for school integration is economic: there are substantial differences in quality between the schools that enroll majority- and minority-race students, and both K-12 and university integration policies have been shown to substantially decrease racial inequality (Billings et al., 2014; Bleemer, 2022). Another common motivation is sociological: as Sandra Day O'Connor wrote in the majority decision of *Grutter v. Bollinger*, collegiate racial diversity "promotes 'cross-racial understanding,' helps to break down racial stereotypes, and 'enables students to better understand persons of different races'," particularly among majority-race students. However, a series of prior studies have questioned whether school integration policies foster or discourage intergroup relations, where the latter may result when "a large [academic] gap between minority students and others at an institution challenges the legitimacy of their presence" at the school (Massey and Mooney, 2007; Arcidiacono et al., 2013). This study directly investigates the long-run social integration and cohesion effects of racial integration and cross-race academic match in U.S. higher education.

We construct a novel database linking 1988-2008 administrative University of California undergraduate and graduate student records and UC Berkeley undergraduate housing records with annual residential Census Blocks, spousal race, political activities, and locations of professional practice through 2023. We first employ these data using a series of simple single-difference, difference-in-difference, and triple-difference research designs around the 1998 implementation of Proposition 209, a statewide affirmative action ban that generated several natural experiments: undergraduate Black and Hispanic (underrepresented minority, or URM) enrollment declined by 40 percent and improved academically at UC Berkeley, *only* improved academically at other undergraduate UC campuses, and declined by about half at several UC medical, law, and business schools. We find no meaningful relationship between either undergraduate or professional schools' racial diversity or their cross-race academic match and later-life racial integration measures like the racial diversity of graduates' neighborhood or public elementary school, interracial marriage, political affiliation, or professional location of practice, measuring outcomes between students' mid-20s and mid-40s. Despite particular concern regarding the diversity of medical schools (e.g. Ly et al.,

2022), de-integrating public medical schools in California did not affect the racial composition of the communities where graduates of those schools practiced medicine.

We then leverage the UC Berkeley freshman housing lottery to conduct a closer examination of university housing, a key channel through which university integration may foster intergroup contact. Using a recentered instrumental variable design to isolate the random component of the housing lottery (Angrist et al., 2023), we again rule out sizable effects of having a minority roommate on majority students' later-life racial integration both before and after Prop 209. We uncover some evidence that academic differences by race explain these null effects: minority students' average test scores are far below those of their majority peers, but majority students assigned minority roommates with above-median test scores live in slightly more-integrated neighborhoods later in life. We also uncover substantial evidence of racial integration among *minority* students – those assigned minority roommates live in neighborhoods that are about 0.4 standard deviations less-integrated in their 40s – complementing other recent evidence that interracial contact has asymmetric and convergent effects almost wholly driven by effects on minority groups (e.g. Bleemer, 2025).[1] We conclude with a simulation exercise ruling out any meaningful role for collegiate diversity policies in fostering U.S. racial integration or cohesion.

Our study begins by documenting a series of novel facts about the University of California's 1998 implementation of Prop 209. Freshman URM enrollment at UC Berkeley declined by almost half, driven particularly by declines among Hispanic women, and the average share of URM students in non-URM students' classes fell by about a quarter. Freshman URM enrollment was unimpacted at the other UC campuses with observed administrative records – the UC campuses at Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz (plus San Francisco, which has no undergraduate students) – due to the enrollment cascade, with each campus enrolling students who would previously have enrolled at more-selective campuses (Conrad and Sharpe, 1996; Bleemer, 2022). Due to the compositional changes resulting from this cascade, URM students' academic preparation and performance improved across all UC campuses, but the observable characteristics of non-URM students remained largely unchanged in 1998, likely because their far larger enrollment numbers meant that the end of affirmative action had only second-order effects on non-URM

[1]The asymmetric and convergent effects of other-race roommate assignment mirror the asymmetric and convergent peer effects between lower- and higher-income students documented by Chetty et al. (2022).

students' enrollment options.The following year (1999), admission policy changes at UC Berkeley ended this year-over-year observable comparability of non-URM students by increasing enrollment from high-minority-enrollment high schools.

Our primary data source documenting the longitudinal racial integration and cohesion of UC students is the national 2023 L2 voter registration database, augmented by the annual California voter registration databases from 2006 to 2023. We link seven UC campuses' student records to voter registration data by name and birth date and restrict our baseline sample to men (since women are more likely to change their names following marriage, reducing the match rate), resulting in a match rate of about 75 percent.[2] All matched voters are geolocated to their home address, and about 60 percent are uniquely matched to 'spouses', defined as their sole registered coresident within 15 years of their age. Spouses' ethnicities are predicted by L2 database using full (and maiden) name.[3]

Prop 209 caused one of the largest year-over-year changes in school integration in US history and provides a leading case study of the ramifications of integration on the long-run integration outcomes of majority-race students. Our baseline analysis compares the outcomes of 1995-1997 and 1998 non-URM male freshman students at UC Berkeley with each other, with students at other UC campuses (who experienced a similar change in URM peers' academic match without a change in net enrollment), with other California voters, and with voters in neighboring states in a series of single- and difference-in-difference research designs. Attending a more racially-diverse university does not lead non-URM students to live in more diverse neighborhoods or zoned elementary schools (within or across counties) – with 95-percent confidence intervals clustered by major and high school that rule out changes of more than 0.1 standard deviations – and if anything leads them toward *lower* levels of interracial marriage. These estimates are confirmed by triple-difference designs comparing students in more- and less-diverse college majors and who attended more- and less-diverse high schools. There is weak evidence of increased residential integration in students' mid-20s, but this phases out within a few years. There are no observed effects at the campuses where academic match improved, nor observed effects on other outcomes like political

[2]Appendix E shows that our main findings hold similarly for the 50 percent of women who match to the voter registration data.

[3]Appendix C shows that L2's ethnicity predictions are imperfect but capture strong signal, matching ACS interracial marriage trends and with Type 1 and 2 error rates of 20-35 percent. Error is lower for the Hispanic students who make up the large majority of URM UC students.

affiliation, voting behavior, or working in public service employment (as observed using public LinkedIn profiles).

Next, we turn to the effects of racial integration at graduate schools. The University of California's graduate medical, law, and business schools each phased out affirmative action between 1994 and 1997. URM enrollments declined by between 30 and 50 percent at these schools, but non-URM graduates of law and business schools became *if anything* more likely to marry URM spouses, with no other observable changes in integration outcomes. We link doctors to national registration and Medicare records to observe locations of practice for about 90 percent of graduating doctors and patient racial composition for over half. The decline in URM medical students does not lead graduates to practice in less-diverse neighborhoods, partly due to an increase in the URM share of the neighborhoods where remaining URM doctors practice, but may lead non-URM doctors to select subfields with slightly higher URM patient shares (emergency medicine rather than primary care).

While our analysis of Prop 209 provides an at-scale case study for the potential effects of university integration policies on majority students' later-life racial integration, the small number of treated schools leaves open the possibility of another 1998 shock biasing our baseline estimates. We further hone in on the effects of collegiate interracial interaction on later-life integration by studying the effects of being randomly assigned an other-race freshman-year college roommate. Leveraging comprehensive 1994-2007 housing lottery records from UC Berkeley, we estimate empirical propensity scores for being assigned a URM roommate using simulations of the contemporaneous freshman housing lottery (Abdulkadiroglu et al., 2017) and employ them in a recentered instrumental variable strategy to isolate the causal effect of having a URM roommate. Our findings rule out meaningful effects of having a URM roommate on non-URM students' long-run racial integration either before or after the cessation of affirmative action, but we estimate small statistically-significant effects for well-matched non-URM students – suggesting that one reason Prop 209 had no measurable integration effect is that URM enrollment largely increased among lower-testing URM students – and for URM students.

We currently have a survey in the field to the 1988-2008 UC Berkeley undergraduate freshman cohorts. Questions elicit students' on-campus social environments and friend composition, postgraduate interracial interactions (including whether they have hired a Black or Hispanic em-

ployee), and relevant beliefs (including support for affirmative action). Pilot surveys suggest a 10–15 percent response rate. The introductory letters are currently being printed; results for all research designs will be available by May.

This paper primarily contributes to a large prior literature on intergroup contact. Williams (1948) formalized the idea that the effects of intergroup contact are unclear: depending on the context, exposure to members of an "out-group" may reduce prejudice by fostering empathy and understanding between groups (see also Allport, 1954), but it may also increase the salience of a perceived threat or reinforce existing hierarchies. While intergroup contact observationally reduces cross-group prejudice (Pettigrew and Tropp, 2006), a recent survey of experimental and quasi-experimental studies finds that effects tend to be weak, heterogeneous, and context-specific (e.g. Mousa, 2022; Weiss, 2021; Lowe, 2021), with little evidence on long-run effects (Paluck et al., 2019).[4] Our study employs quasi-experimental research designs to examine the long-run racial integration implications of a large protracted change in intergroup contact among thousands of young Americans, examining both the effects of overall contact and of improved 'match' in young peoples' communities of four years.

Educational institutions are young Americans' primary hub of social contact, and students' allocation across schools is strongly shaped by the decisions of school administrators and other policy-makers. As a result, a large scholarly literature has devoted particular attention to the ramifications of intergroup exposure at K-12 schools and colleges. While much of the literature is observational (e.g. Bowen and Bok, 1998; Hurtado et al., 1998; Gurin et al., 2002; Chang et al., 2004; Hinrichs, 2011), several influential studies have found that interracial exposure in first-year college roommate assignment increases interracial socialization and decreases measures of racial prejudice while in college (Marmaros and Sacerdote, 2006; Boisjoly et al., 2006; Camargo et al., 2010; Corno et al., 2022).[5] Our study augments these prior studies in three ways: (1) by analyzing

[4]Quasi-experimental analyses of governmental housing integration policies have shown that shrinking the size of a minority residential population can increase intergroup contact (Algan et al., 2016) and integration (Bazzi et al., 2019).

[5]Evidence of a positive within-school relationship between high school cohort diversity and later-life racial integration (Merlino et al., 2019, 2022) has not been validated by quasi-experimental shocks to white students' neighborhoods or school composition (Gordon and Reber, 2018; Goldman et al., 2024), though Shen (2018) finds evidence of increased cross-race partnership for Black women following school desegregation. Londoño-Vélez (2022) finds that increasing a university's lower-income enrollment affects its higher-income students' friendship networks and increases those students' preference for redistribution one year later, though Baker et al. (2011) find no relationship between freshman dormitory diversity and Facebook friend composition. Rao (2019) and Scacco and Warren (2018) find evidence of

policy-relevant school-wide exposure shocks that affect not only roommates but also curricular and extracurricular peer exposure; (2) by measuring long-run, real-world behavioral outcomes; and (3) by evaluating the effects of both overall interracial exposure and differential exposure by academic match, which may have opposing effects (e.g. Arcidiacono et al., 2011, 2013; Carrell et al., 2019).

2 Background

The University of California comprises the ten public research universities in the state, nine of which maintain undergraduate programs. From the 1950s to the 1990s, UC's undergraduate and graduate degree programs gradually transitioned from being openly accessible to qualified applicants toward relying on increasingly selective admissions criteria. Race-based preferential admissions began in UC undergraduate admissions in the early 1960s and in graduate admissions shortly thereafter. The US Supreme Court protected race-based admission preferences in 1978, stating that "the 'nation's future depends upon leaders trained through wide exposure' to the ideas and mores of students as diverse as this Nation of many peoples."

Race-based admission preferences persisted in California until they were prohibited in the mid-1990s, first by the UC Regents in their 1995 Special Policy 1 and then by Proposition 209, a 1996 statewide ballot proposition. While both faced legal and administrative hurdles, racial preferences ended in UC graduate admissions by 1997 and in undergraduate admissions in 1998.[6] The latter ban led to a 'cascade' of Black, Hispanic, and Native American (underrepresented minority, or URM) students from more- to less-selective public colleges and universities in the state: the most-selective UC Berkeley and UCLA saw large URM enrollment declines while the middle- and less-selective UC campuses saw little net change in URM enrollment, as they gained some URM students from the more-selective schools while losing others due to the end of their own race-based admission preferences (Conrad and Sharpe, 1996; Bleemer, 2022). Further admission policy changes led to a slight rebound in UC Berkeley's 1999 URM enrollment – perhaps spurred by a 1999 lawsuit alleging anti-Black discrimination (Schoenfeld, 2004) – but its freshman URM

prejudice reduction following cross-class and cross-religion contact in developing countries.

[6]Many graduate programs stopped providing race-based preferences earlier than the 1997 deadline, perhaps due to increased scrutiny and legal risk-aversion in the period. See Table A-10.

enrollment remained about 40 percent below its pre-1998 levels.[7]

UC Berkeley's affirmative action program was among the largest in the history of US higher education in both numbers and proportions (see Appendix D). The campus also facilitated cross-group integration by implementing a housing lottery for first-year students, with about 54 percent of freshmen being assigned to their dormitory room and roommates by a complex stochastic assignment algorithm.

3 Data

We study the racial integration ramifications of racial diversity and cross-race academic match by analyzing two primary datasets, described here and in greater detail in Appendix A. The first consists of detailed student records from seven University of California campuses – including UC Berkeley as well as the campuses at Davis, Irvine, Riverside, San Francisco, Santa Barbara, and Santa Cruz – obtained from each campus's Office of the Registrar (Bleemer, 2018). The data cover all undergraduate and graduate students who enrolled at each university between 1988 and 2008 and include students' gender and race, home Zip code, high school, declared majors, academic index (a composite index of SAT scores and high school GPA) and which classes they enrolled in each semester. We define underrepresented minority (URM) students as those who report being Black, Chicano, Latino, or Native American and define non-URM students as all other students.

Table 1 provides descriptive statistics of undergraduate UC Berkeley and other UC students by ethnicity in the years before and after the 1998 ban on affirmative action. About 90 percent of UC students were California residents in this period, and UC Berkeley students tended to be higher-income (as proxied by the average income of the residential Zip code) and attend high schools with smaller URM populations than students at other UC campuses. Non-URM students tended to be higher-income and higher-performing academically than their URM peers.[8]

Our second primary dataset consists of a 2022 cross-section of all fifty US states' voter reg-

[7]Policy changes generating partial URM share reversion are common 2-3 years following affirmative bans (see Appendix D).

[8]GPA fixed effects, our preferred measure of collegiate academic performance, are the unshrunken fixed effects from an Abowd et al. (1999)-style decomposition of course GPAs into student and course-term fixed effects estimated *across* UC campuses and years, relying on the relatively high number of students who are observed to transfer between UC campuses. See Appendix A.

istration databases, collected by and obtained from the firm L2. These data include each voter's residential address, longitude/latitude, imputed gender and ethnicity, and political party. Figure A-2 shows that we uniquely match about 75 percent of male UC students but fewer than 50 percent of female UC students to voter records using name and birth date, with the difference likely arising due to marital name-changes in the latter group. As a result, we restrict our baseline analysis to male students, though Appendix E shows similar results for matched women. We also collect annual California voter registration databases for 2006-2017, 2020, and 2023, though these data do not include imputed gender and ethnicity.

We impute spouses in the voter registration data if a voter resides at the same address as exactly one other voter within 15 years of their age, resulting in a spousal match rate of about 65 percent among matched male UC students in the mid-1990s (Figure A-2(c)). About 90 percent of those matches are to women. Gender and ethnicity are imputed by past and current first, middle, and last names (Rosenman et al., 2023). Appendix C shows moderate rates of Type 1 and 2 error in ethnicity prediction (when compared to matched UC self-reported ethnicities) but relatively accurate aggregate interracial marriage rates in the relevant California cohorts when compared with aggregates from the 2021 American Community Survey. Voter match, spousal match, and the quality of ethnicity prediction all trend smoothly in the late 1990s in California and are unlikely to explain any observed changes in longitudinal outcomes in 1998.[9]

Finally, we augment these linked records with a number of auxiliary datasets to further characterize UC students and voters. We match each California voter to their geographically-closest public elementary and high school and observe average annual URM enrollment shares for those schools from the California Department of Education.[10] We geolocate each voter into their 2010 and 2020 Census blocks and tracts and use 2010 and 2020 US Census data to define (1) residential integration by the URM share of residents in their block or tract and (2) residential gentrification by the change in the non-URM residential share between that address's 2010 tract and its 2020 tract. We also match each student to their public LinkedIn profiles by name, alma mater, and co-

[9]Table A-1 shows that measured residential URM shares and interracial marriage correlate as expected with UC alumni characteristics; for example, non-URM UC alumni who attend a high school with a 10 percent higher URM enrollment share live in Census blocks with 1.3 percentage points higher URM residential shares and are 0.7 percentage points more likely to have a URM spouse.

[10]Note that we do not observe school cachement zones – instead assigning each family to their nearest local elementary and high school – nor do we observe which voters have children.

hort – obtaining a 25 percent match rate (Figure A-2(d)) – and observe their annual occupations and industries in the past 10 years.

4 Case Study: Proposition 209

4.1 Research Design

Rising selectivity and changing admissions policies contributed to a steady decline in Berkeley's freshman URM enrollment in the 10 years leading up to 1998, but Figure 1 shows that the school's freshman URM enrollment discontinuously declined – from almost 20 percent to about 10 percent – when affirmative action was banned in 1998.[11] URM enrollment at other UC campuses was steadily rising throughout the 1990s and 2000s, tracking Hispanic population growth across the state (Bleemer, 2020), and did not sharply change in 1998.

While affirmative action approximately doubled the number of URM students on Berkeley's campus until Prop 209, the policy did not obligate students to interact across racial lines once they were on campus. While data on students' interactions through extracurricular activities are currently unavailable, Figure 2 visualizes non-URM students' curricular and dormitory exposure to URM students by cohort. Among the 73 percent of freshmen who lived in dormitories, the URM share of non-URM students' roommates and floormates matched the school's population falling from 20 to 12 percent in 1998. The typical non-URM student's typical class fell from about 17 to 13 percent URM after Prop 209, reflecting academic segregation across classes.[12] Curricular integration also declined more smoothly in the years immediately before and after Prop 209, since URM students who enrolled in 1998 may have taken some classes with students from earlier cohorts with higher URM enrollment shares.

The composition of URM students at Berkeley and the other UC campuses immediately changed following Prop 209. For example, both the URM students remaining at UC Berkeley and the 'cascaded' students now enrolling at the other UC campuses were higher academically performing than the URM students of earlier cohorts (See Figure A-4). However, Figure A-3 shows that the com-

[11] The smaller discontinuous URM enrollment decline in 1992 followed admission policy changes stemming from that campus's Karabel report (Leonard, 1993).

[12] Academic segregation could reflect both self-segregation and major-segregating university policies like major restrictions (Bleemer and Mehta, 2021).

position of non-URM UC students was little changed in 1998 relative to earlier years. While the end of affirmative action provided greater selective university access to on-the-margin non-URM students, non-URM students were proportionally much less impacted than their URM peers; for example, the 8 percentage point decline in the URM enrollment share at UC Berkeley represents a 40 percent decline in URM students but only a 10 percent increase in non-URM students. UC Berkeley admission policy changes in 1999 appear to have meaningfully affected the subsequent composition of URM students, with coincident rises in URM enrollment and the high school URM enrollment share of non-URM students (likely indicating high-school-based admission targeting); as a result, post-1999 cohorts are less likely to have the same average potential outcomes as cohorts in earlier years.

We leverage the abrupt change in overall URM enrollments at UC Berkeley – and the absence of such changes at the other UC campuses (though they saw slight improvements in cross-race academic match) – to estimate the effects of racial integration and match on university campuses on the racial integration and cohesion of non-URM students over the subsequent 25 years. Our main analysis consists of single-difference, difference-in-difference, and triple-difference research designs comparing the outcomes of 1998 non-URM Berkeley students to those of earlier Berkeley cohorts and relative to changes among other groups of young people. Consider the effect of attending a more-diverse university relative to attending a less-diverse university on outcome Y. Each student i has the potential outcome $Y_i(1)$ if they attend a more-diverse university and $Y_i(0)$ if they attend a less-diverse university. Each research design has an associated identifying assumption over the circumstances under which students in the 'treatment' group – those enrolled at UC Berkeley in 1998 – are assumed to have the same potential outcomes as people in the 'untreated' group:

- **Single-Difference**: Differencing out a time trend, 1998 Berkeley students are assumed to have the same potential outcomes as earlier cohorts of Berkeley students.

- **UC Diff-in-Diff**: The change in potential outcomes at UC Berkeley is assumed to equal the change in potential outcomes at the other UC campuses, all students at which are 'untreated'.[13] Alternatively, we assume that this holds when restricting Berkeley students to

[13]This design would difference out both consistent changes in UC enrollment across campuses as well as changes in outcomes arising from improvements in academic match with URM students, which occur across all UC campuses.

those with sufficiently-high Academic Indices that they would have been guaranteed admission whether or not affirmative action was implemented.[14]

- **Voter Diff-in-Diff**: The change in potential outcomes at UC Berkeley is assumed to equal the change in potential outcomes among non-UC voters in (a) California or (b) four nearby states (Washington, Oregon, Nevada, and Arizona).

- **Major Triple-Difference**: The change in potential outcomes among Berkeley students in majors with a high proportion of URM students, relative to the change among Berkeley students in majors with a low proportion of URM students (which saw only small changes when affirmative action ended), is assumed to equal the relative change among students at other UC campuses.

- **HS Triple-Difference**: The change in potential outcomes among Berkeley students who attended low-URM high schools (who might be expected to be particularly sensitive to a more-diverse college environment), relative to the change among Berkeley students who attended high-URM high schools, is assumed to equal the relative change among students at other UC campuses.

We implement each of these baseline research designs for a series of racial integration outcomes Y in two ways. The first is by presenting mean Y by cohort among non-URM freshman Berkeley students, other UC students, other California voters, and other non-California voters (where voters are assigned to the cohort of birth year plus 18). These figures permit direct observation of differential outcomes at UC Berkeley and the other UC campuses after 1998. Second, we estimate linear regressions for a series of outcomes Y, estimating models of the following form over non-URM males in the 1995-1998 cohorts:

$$Y_{it} = \alpha^1 + \beta^1 AA_{it} + \gamma^1 t + \epsilon^1_{it} \tag{1}$$

$$Y_{it} = \alpha^2_t + \beta^2 (AA_{it} \times Bkly_{c_i}) + \gamma^2 Bkly_{c_i} + \epsilon^2_{it} \tag{2}$$

$$Y_{it} = \alpha^3_{c_i t} + \beta^3 (AA_{it} \times Bkly_{c_i} \times T_i) + \gamma^3 T_i + \delta^3 (AA_{it} + T_i) + \zeta^3 (Bkly_{c_i} \times T_i) + \epsilon^3_{it} \tag{3}$$

[14] See Bleemer (2022) for definition of academic index and evidence that non-URM students with $AI > 7,500$ would have been consistently near-guaranteed UC Berkeley admission.

where i attends campus c_i as a freshman in t and realizes Y_{it}, AA_it indicates the presence of affirmative action (1995-1997), $Bkly_{c_i}$ indicates enrollment at UC Berkeley, and T_i indicates either enrollment in a major in the top tercile of URM enrollments at that campus in 1995-1997 or enrollment at a high school in the bottom tercile of URM enrollments in California. The sample is restricted to Berkeley students in (1); to all Berkeley students (or restricted to students with an Academic Index over 7,500) plus students at other UC campuses, California voters, or non-California voters in (2); or to all UC students in the top and bottom tercile of the variable defining T_i in (3).

Inference is challenged in the setting – as in any difference-in-difference setting with a small number of treated units – by the possibility of other simultaneous shocks occurring in 1998. We provide standard errors two-way clustered by students' high school and institution-major, permitting correlated shocks by students' local geography and school community. These may be downward-biased relative to design-based standard errors clustered by institution (which is infeasible in this setting, since there are only six institutions), and should be understood as reflecting statistical error that assumes the absence of exogenous institution-level shocks.

4.2 Racial Integration in Undergraduate Programs

4.2.1 Residential Integration

While about half of California residents are URM, the typical mid-40s non-URM Californian lives in a Census block – a narrowly-defined neighborhood with median 60 residents – where 26 percent of residents are URM, with a standard deviation of 21. Local elementary schools are far less segregated than residential blocks, and the nearest public elementary school to a non-URM California resident enrolls about 50 percent URM students. Residential and school district segregation is higher for older Californians and similar for men and women. UC-educated non-URM Californians live in far more segregated areas than the typical resident of the state; the typical mid-40s Berkeley alumnus lives in a neighborhood that's 18 percent URM and has an elementary school with 35 percent URM students. Figure 3(a) shows that 2023 residential and elementary school segregation smoothly rises across Berkeley and other UC cohorts, reflecting the same age pattern as across all Californians. If anything, there is some visual evidence of a *rise* in the racial diversity of the elementary schools near UC Berkeley alumni after 1998. Figure A-5 shows similar flat trends

in Berkeley and other UC alumni's residential Block Groups (a larger level of aggregation than Blocks), nearest public high school, and flow measures of gentrification in their residential Blocks.

Panel A of Table 2 shows that estimation of Equations 1 and 2 comparing the residential integration of post-1998 UC Berkeley alumni with earlier alumni, alumni of other UC campuses, and other similar-age residents of California and neighboring states reveals precise null differences between these groups: attending a more racially-diverse university did not affect the racial composition of their mid-life residential neighborhood. While residential location may partly reflect professional or family obligations rather than neighborhood preference, Table A-2 re-estimates these models with county fixed effects – absorbing cross-county variation that may reflect these other obligations (despite its endogenous choice) – and reveals even more precise null effects. The estimated effects are similarly null when the comparison window is widened to the six years following 1998 (Table A-3) and when we estimate changes at the other UC campuses where URM students' academic match improved (Table A-5).

Figure 4 presents estimates of β^2 from Equation 2 comparing Berkeley to other UC campuses where the outcome is the URM residential or school share of individuals' location of residence as recorded in annual 2006-2023 California voter registration records, which limits the sample to California-resident registered voters. It shows persistent and precise evidence of null effects of collegiate racial integration starting by age 30. While there is slight statistically-noisy evidence of elevated URM residential Block shares in Berkeley students' late 20s, suggesting the possibility that positive effects of collegiate integration fade out over the decade following college enrollment, those estimates are more likely the result of anomalous 1998 residential behavior by non-Berkeley UC students than they are the result of fading-out integration-oriented residential preferences (see Figure A-6).

Finally, Table 3 focuses on two groups of non-URM Berkeley students likely to face outsized effects of racial integration policies at that school: students whose fields of study were in the top URM enrollment tercile in 1995-1997 and students whose high schools were in the bottom URM enrollment tercile across California high schools. Whether comparing each of these groups before and after 1998, comparing them relative to students in the opposite tercile of each category, or comparing students in those terciles between Berkeley and the other UC campuses, we find precise null relationships between school integration and residential location. We conclude that collegiate

racial integration has no more than a negligible effect on the residential integration of white and Asian Americans.

4.2.2 Interracial Marriage

About 10 percent of white and Asian Californians in their mid-40s are married to Black, Hispanic, or Native American spouses, slightly higher than the interracial marriage rates in neighboring states.[15] Panel (a) of Figure 5 presents the URM spousal rates for the approximately six percent of male Berkeley and other UC freshmen whose spouses were peers from their own institutions.[16] While the annual statistics are noisy, there is weak evidence that among the non-URM Berkeley students who married peers, those who enrolled in the years after 1998 were somewhat less likely to have URM spouses than those who enrolled before 1998; indeed, the data do not include a single non-URM member of the 1998 Berkeley freshman cohort who married a URM spouse.

However, Panel (b) shows that expanding the spousal pool to all spouses suggests the opposite effect: if anything, white and Asian men who attend Berkeley after 1998 are *more* likely to marry URM spouses than those who attend prior to Prop 209.[17] There is no observable change in intermarriage rates among non-URM students at the other UC campuses. The increase in URM spouses is observed for both Black and Hispanic spouses (particularly the former); there is no observed change in white men marrying Asian spouses (see Figure A-7). Panel B of Table 2 suggests that URM marriage rates may not be higher among the post-1998 Berkeley non-URM freshman cohorts than would be expected given younger non-URM Californians' higher URM marriage rates (with p-values around 0.1), but the presented estimates sharply reject any meaningful positive relationship between racial diversity and interracial marriage in the Berkeley setting. Table 3 shows specification-dependent but typically negative relationships between racial diversity and interracial marriage in the triple-difference designs. The estimated relationship between racial academic match and interracial marriage at the other UC campuses is precisely null relative to other

[15] While the statisics presented in this section use the broad definition of 'spouse' discussed above and employ L2's ethnicity estimates, these statistics closely match California and non-California averages from the American Community Survey using true spouses and ethnicities; see Appendix C.

[16] Note that this requires the UC spouse to have not changed their name following marriage, since this would prohibit record matching.

[17] The point estimates of Merlino et al. (2019), extrapolated from high school to college, would have implied a decline in interracial marriage rates of about 2 percentage points.

Californians or non-Californians (Table A-5).

4.2.3 Other Outcomes

We also investigate the relationship between racial diversity and/or racial academic match and:

- Political affiliation: Democrat, Republican, or Independent (Figure A-8);
- 2020 voter participation – a year when California voters had their first opportunity to overturn Prop 209 and legalize race-based admissions preferences – measured overall or relative to their predicted likelihood of voting based on prior years' voter participation (Figure A-9);
- Estimated interest in domestic or international travel, as measured by L2 using magazine subscriptions and other commercial data (Figure A-10); and
- Employment in a public-service-oriented industry, as measured among linked LinkedIn users (Figure A-11).[18]

There are no observed differences in any of these outcomes between Berkeley or other UC freshman in cohorts before and after 1998, nor any even suggestive evidence that racial diversity or racial academic match affected any of these integration or employment outcomes.

4.3 Racial Integration in Graduate Programs

Prop 209 also prohibited race-based affirmative action in graduate school admissions, which may have had a different effect on students' racial integration and long-run cohesion due to the relatively small cohorts, shared professional interests, and enrollment ages closer to typical marriage years. Unlike in undergraduate admissions, there is no observed cascade of students across UC's graduate programs; each program experiences a substantial decline in URM enrollment in the mid-1990s, though some programs ended their race-based preferences as many as three years prior to the 1997 requirement. We focus on the UC system's largest professional graduate programs – in medicine, law, and business – and identify each school's cessation of affirmative action as the year between 1994 and 1998 with the largest proportional decline in its annual URM enrollment.[19]

[18] Bowen and Bok (1998) hypothesize that racially-diverse universities lead their students toward public-service occupations.

[19] Included medical schools (and estimated year of affirmative action cessation) are Davis (1994), Irvine (1995), and San Francisco (1997); law schools are Berkeley (1997), Davis (1995), and Irvine (1994); business schools are

4.3.1 Graduate Professional Schools

Panel (a) Figure 6 shows that average URM enrollments in each graduate program type fell year-over-year by about 50 percent following the cessation of affirmative action. UC's medical and law schools' URM enrollment fell from about 20 to 10 percent, while its business schools' URM enrollment fell from 10 to 5 percent.[20]

Long-run integration outcomes are more noisily measured for graduate students due to their smaller numbers, but as above, we observe no evidence that attending a more racially-integrated graduate program leads non-URM students toward more diverse residential neighborhoods, higher rates of interracial marriage, or different political affiliations.[21] The only (noisily) observable change after the end of race-based preferences is some evidence – shown in Panel (b) of Figure 6 – of *increased* interracial marriage rates among non-URM law and business students, mirroring a similar pattern among the undergraduates.

4.3.2 Medical Schools and Doctors

We conduct a more detailed investigation of the racial integration outcomes of attending a diverse medical school, both because of outsized interest in the ramifications of diversity in medical training Saha et al. (2008); Ly et al. (2022) and because of strong data availability on the practice of US medical professionals. We link enrollees at UC San Francisco, UC Irvine, and UC Davis Schools of Medicine to their National Provider Identifier (NPI), a popular unique identifier for US healthcare professionals, by name (including maiden name, permitting high female match rates) and birth date using the Medicare Provider Practice and Specialty (MD-PPAS) dataset, which includes all doctors who treat Medicare patients and covers about 80 percent of students. Unmatched medical students are further linked to two doctor databases by name, medical school, and year of graduation: (1) the Medical Board of California (MBC) licensing database, which includes all doctors licensed to practice in the state; and (2) a complete database of online doctor profiles from Doximity, a popular medical networking platform. We link about 70 (85) percent of remaining doctors to

Berkeley (1997) and Davis (1996).

[20] California's law schools saw larger URM enrollment declines than the 20 percent national average decline following affirmative action bans (Brooks et al., 2024).

[21] See Figure A-15. A-14 shows similar rates of voter registration match by gender in the graduate student sample to the undergraduate sample, which again leads us to present our main results for only male students. Figure A-16 replicates these results for the full sample (including matched women) and shows similar patterns.

the MBC (Doximity) databases, resulting in a total match rate of about 95 percent, or between 150 and 200 doctors per cohort. See Appendix A for details.[22]

Doctors' main Zip code of practice and subfield are reported in the national NPI registry (NPPES) and by both the MBC and Doximity databases; we match doctors to 2020 URM share of their Zip code. The Medicare data also report the 2013-2023 annual share of Medicare patients who are Black or Hispanic among doctors who see at least 10 such patients; we assign each doctor to the patient-weighted across-year mean share of their patients who are URM.[23]

Figure 6(a) showed the effect of Prop 209 on the racial composition of UC's medical schools, with the URM population persistently falling from about 25 to 12 percent of students. Figure 7 shows how the end of race-based affirmative action affected the racial integration outcomes of the non-URM and URM students who attended those medical schools, as well as overall averages for these medical students. Note that changes in the URM averages partly reflect compositional changes among URM students, while changes in the overall averages reflect the decreased share of URM students in each cohort. Panel (a) shows that while URM doctors see a higher share of URM patients, the URM patient share of non-URM doctors appears to slightly *rise* in the years after the affirmative action ban, resulting in no net change in the Medicare patient composition of UC-trained doctors after Proposition 209. The same occurs with the residential URM share of the Zip codes where UC-trained doctors practice: there is no observable change in the neighborhood composition of UC-trained doctors following the end of race-based preferences. While the decreased share of URM doctors at UC might have slightly depressed the URM share of their neighborhood of practice, the relatively small *percentage point* change in the URM share of medical students and a (noisy) increase in the URM share of neighborhoods where *URM* UC medical school graduates practice medicine each contribute to the resulting null effect. We also find no meaningful changes in the income composition of UC-trained doctors' neighborhoods or whether the doctors speak Spanish, nor observable effects on the same outcomes for non-URM UC Berkeley undergraduates who become doctors (Figure A-12).

[22] Figure A-17 shows that match rates are 5-10 percentage points lower among women in each database, but similar overall.

[23] We restrict to years in which the doctor sees at least 100 Medicare patients in order to avoid variable censorship when the doctor sees fewer than 10 patients from an ethnicity. See Figure XXX for the resulting match rate of about 60 percent.

5 Analysis of Mechanisms: UC Berkeley Housing Lottery

Despite UC Berkeley's affirmative action program being among the largest ever implemented in the United States, we find no evidence that it improved long-run racial integration for the average non-URM student. However, Figure 2 shows that some Berkeley students may have been relatively unimpacted by Prop 209, suggesting that fostering on-campus intergroup contact could have long-run ramifications that wash out when averaged across the Berkeley campus. In this section, we carefully identify the non-URM integration effects of URM roommates.

5.1 Research Design

UC Berkeley randomizes most first-year students' dormitory assignments via a housing lottery (see Appendix G for details). Students are assigned to a specific lottery type – defined by the year, their gender, the room size (double or triple), one of seven 'unit' blocks of dormitory buildings, and (in some cases) a 'theme' assignment like the Casa Magdalena Mora – and opted-in students are then assigned to specific rooms and roommates by a housing lottery determined by a random seed and students' reported room and roommate preferences. We leverage the complete Berkeley Housing database – including the database of reported student room and roommate preferences, the 2007 computer program used to run the lottery, and a housing database that contains both the initial and final room assignments of all students residing in dormitories – to estimate the effect of having a URM roommate on non-URM students' long-run integration outcomes by a recentered instrumental variable model:

$$\begin{aligned} Y_{it} &= \beta_{it}\hat{U}_{it} + \gamma_{L_i} + \epsilon_{it} \\ U_{it} &= \delta_{it}\big(U_i^A - \hat{p}_i^U\big) + \gamma'_{L_i} + \epsilon'_{it} \end{aligned} \tag{4}$$

where β_{it} captures the causal effect of freshman student i having a URM roommate in t (indicated by U_{it}) on outcome Y_{it}, conditional on lottery fixed effects γ_{L_i} and a flexible function of i's propensity to have a URM roommate $\hat{p}_i^U$. We measure $\hat{p}_i^U$ as the share of 2,000 simulations of that year's freshman housing lottery (differing only by their random seed) in which i is assigned a URM roommate.[24] Whether the student has a URM roommate is instrumented by the difference

[24]Figure A-18 shows the distribution of $\hat{p}_i^U$ by ethnicity, averaging 17 (28) percent for non-URM (URM) students.

between whether the lottery assigned them to a URM rooomate (U_i^A) and their propensity of being assigned a URM roommate ($\hat{p}_i^U$). Abdulkadiroglu et al. (2017) extend Rosenbaum and Rubin (1983) to show that β_{it} is causally interpretable, since URM roommate assignment is conditionally random given $\hat{p}^U$. We estimate equation 4 over each of non-URM and URM 1994-2007 Berkeley male freshmen, either estimating a single β for each group or allowing β to vary by the presence of affirmative action (before and after 1998).[25]

An important limitation of our approach is that while our lottery dataset is complete, we only observe the code used to run the lottery in 2007. While we are able to infer some changes in the relative weight given to various roommate match characteristics over time – for example, there is little homophily between smokers in 1996-1997, suggesting that the housing office hardly penalized smoker-non-smoker matches in those years – there may be unobserved gaps between our lottery and the true lottery, especially in the earlier 1990s cohorts. For example, Table A-7 shows that our reconstructed lottery strongly fails to absorb ethnic homophily in 2004 and 2005 – that is, even conditional on $\hat{p}^U$, URM students are much more likely to have URM roommates than non-URM students – for which reason we omit those two years from our baseline analysis. We provide details on our reconstruction of the Berkeley housing lottery in Appendix G.

5.2 Estimate for Non-URM Students

Table 4 provides diagnostic tests of our causal interpretation of Equation 4 using our reconstruction of the Berkeley housing lottery. The first column shows evidence of strong unconditional ethnic homophily in roommate matches: as a result of their reported preferences, URM students are about 5 percentage points (from a base of 18 percent) more likely to be assigned a URM roommate than non-URM students. Conditioning on $\hat{p}^U$ results in an estimated coefficient of 86.2 – somewhat lower than the expected 100 if our reconstructed lottery were exactly the procedure used to assign rooms in those years – but fully absorbs ethnic homophily, reducing the coefficient from 5.1 to 0.3. Column 3 shows that Equation 4 has a very strong first stage: being assigned a URM roommate by the freshman housing lottery increases a non-URM (URM) student's likelihood of actually living

[25] A-6 shows that about 18 percent students have $\hat{p}_i^U$ equal to 0 or 1, usually because they reported a preference for living with a specific roommates, and that restricting the sample to male L2 matches leads to slight positive selection on SAT scores and parental incomes.

with a URM roommate in their freshman year by above 90 percent (84 percent).

The remaining columns provide evidence of conditional balance on observed characteristics. Non-URM students with and without URM roommates have similar SAT scores and parental incomes, so instrumenting roommate assignment by the lottery has little effect. Among URM students, however, there is a strong negative relationship between being assigned a URM roommate and both SAT score and parental income, though this relationship is almost wholly absorbed by the lottery instrument.

Table 5 shows the relationship between having a URM roommate and non-URM students' later-life racial integration. While there is a weak unconditional relationship between having a URM roommate and the URM share of their 2023 Census block, the 95% confidence interval on the effect conditional on $\hat{p}^U$ and within 2023 Census block is $(-0.8, 1.6)$. Given that the standard deviation of this URM share across non-URM Berkeley students is 16.5, this bounds the effect of having a URM roommate on later-life residential decisions below 0.1 standard deviations.[26] Once again, the point estimates of having a URM roommate on marrying a URM spouse are small and negative. There is no estimable difference in treatment effects between the affirmative action regime and after the ban. Appendix H shows similarly-small effect magnitudes of having a higher share of URM students living on the same floor of their freshman dormitory.

Panel B returns the role of academic match in mediating the integration effects of having a URM roommate on non-URM students. Figure 8 shows that URM students have far lower SAT scores than non-URM students at UC Berkeley: the median 1994-1997 URM student has an SAT score at the 6th percentile of the non-URM students' distribution. We split the URM students at their within-year SAT median – roughly the portion of the URM SAT distribution that overlaps with the non-URM distribution – and separately estimate the effect of having an above- or below-median URM roommate on non-URM students.[27] Panel B provides evidence of divergent effects: while there are small positive effects of being assigned a high-testing URM roommate on non-URM students' later-life residential integration (as measured by both residential block and elementary school), there are no such effects for students assigned low-testing URM roommates. While this

[26] Focusing on the subset of students who attended high schools with bottom-tercile URM enrollment results in the upward-shifted confidence interval of $(-0.9, 3.9)$, suggesting the potential for intergroup contact to foster long-run racial integration among students with minimal prior contact.

[27] This requires constructing separate $\hat{p}^{U,Above}$ and $\hat{p}^{U,Below}$ measures and instruments.

suggests a minor role for well-matched interracial interaction in college in integrating the lives of non-URM students, even the largest effects represent less than a 0.2 standard deviation increase in residential integration (as measured within the non-URM sample).

Finally, Panel C of Table 5 turns to the effects of URM roommates on *URM* students. Here there is evidence of relatively strong effects on long-run racial integration: URM students who have a URM roommate live in a neighborhood that is 7.5 percentage points (between 0.1 and 0.5 standard deviations) less non-URM and live near elementary schools that are 6.2 percentage points less non-URM ($p = 0.1$). Estimates of interracial marriage are statistically noisy. These estimates imply that interracial contact in college has asymmetric long-run integration effects by race, pulling minority students into more-integrated neighborhoods without meaningfully affecting majority students. While there is no measurable effect on annual wages – with point estimates of almost exactly 0 – these results provide another mechanism by which policies like affirmative action affect only minority students.

6 Conclusion

This study investigates the long-run cross-race integration and cohesion effects of racial integration and cross-race academic match in U.S. higher education. Leveraging the considerable quasi-experimental variation in undergraduate and graduate University of California enrollments generated by Proposition 209 using a series of differencing research designs, we find little evidence that either racial integration or cross-race academic match meaningfully increases later-life residential integration, cross-race marriage rates, racial integration in professional settings, political affiliation, or a series of other related outcomes. If anything, white and Asian students at university campuses with sizable Black and Hispanic student populations appear *less* to marry Black or Hispanic spouses. Random assignment to URM roommates does not increase non-URM students' later-life integration in the presence or absence of affirmative action. While race-based affirmative action and other policies designed to expand selective university access to minority students improve economic equity and efficiency (Bleemer, 2022), their sociological effects on long-run racial integration through the changed behaviors of majority students appear second-order.

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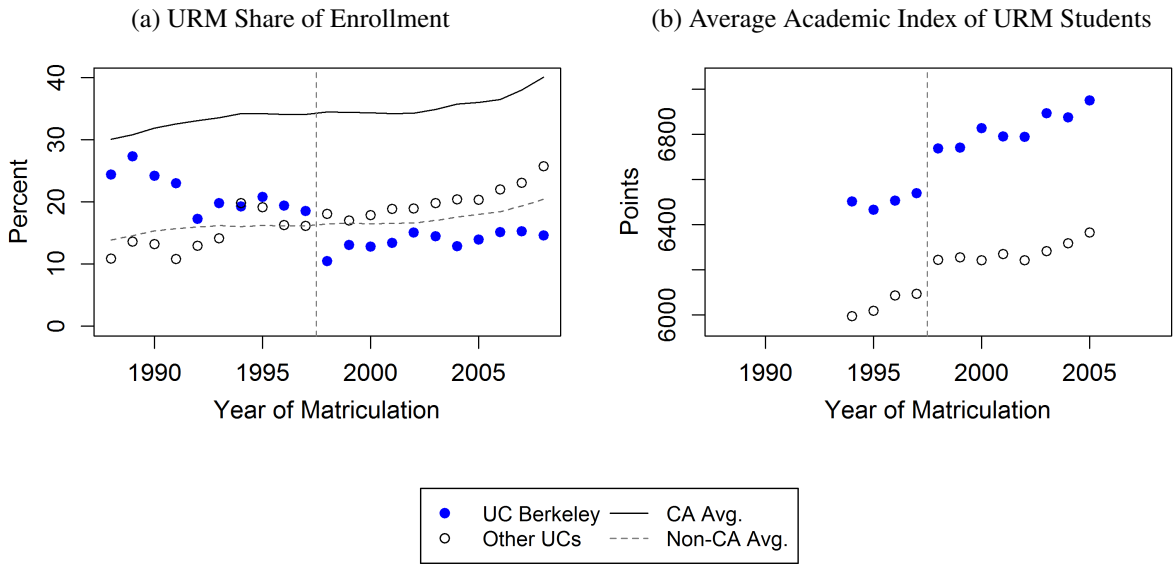
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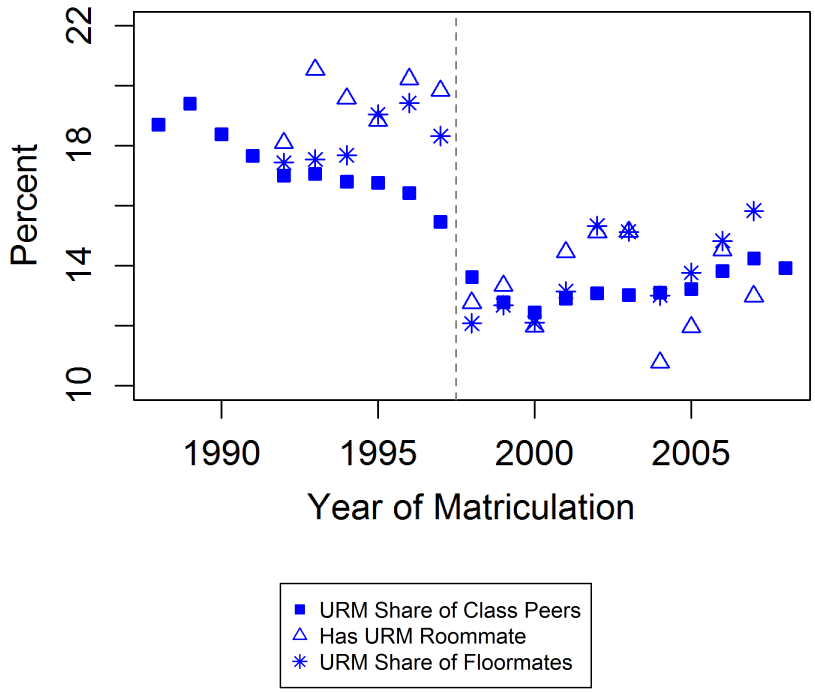
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Figure 1: The Effect of Undergraduate Affirmative Action on URM Enrollment



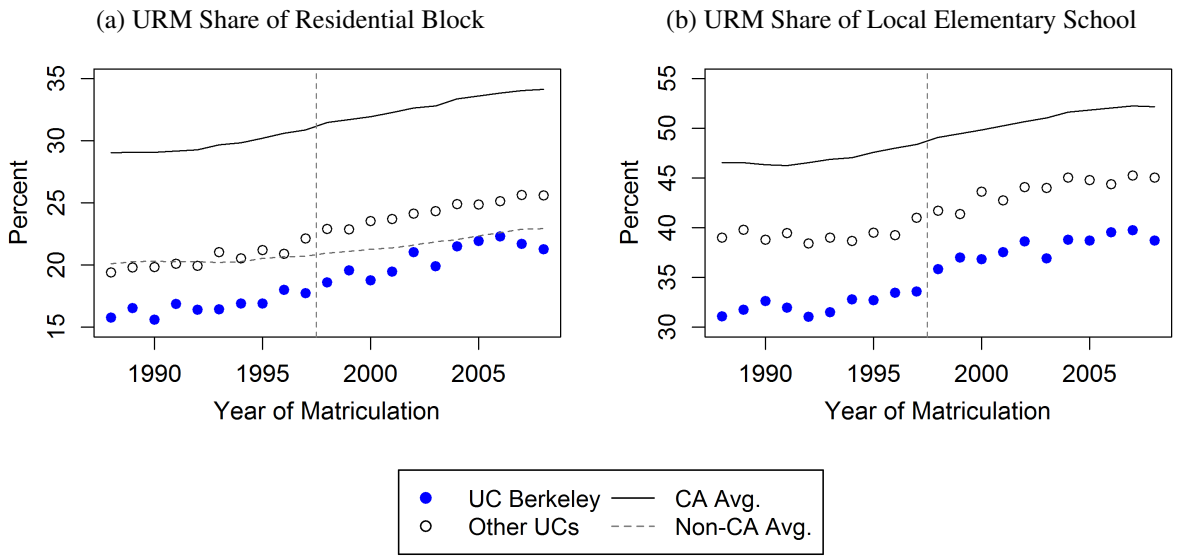
Note: The annual share of freshman UC students or state residents who are URM and the average UC Academic Index of URM freshmen by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. The UC Academic Index is scored out of 8,000 as is defined as the weighted high school GPA (censored at 4.0) times 1,000 plus students' SAT score (out of 1600) plus students maximum scores on three SAT II subject exams (each out of 800): a writing exam, a math exam, and one additional exam. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

Figure 2: The Effect of Undergraduate Affirmative Action on URM Exposure at UC Berkeley



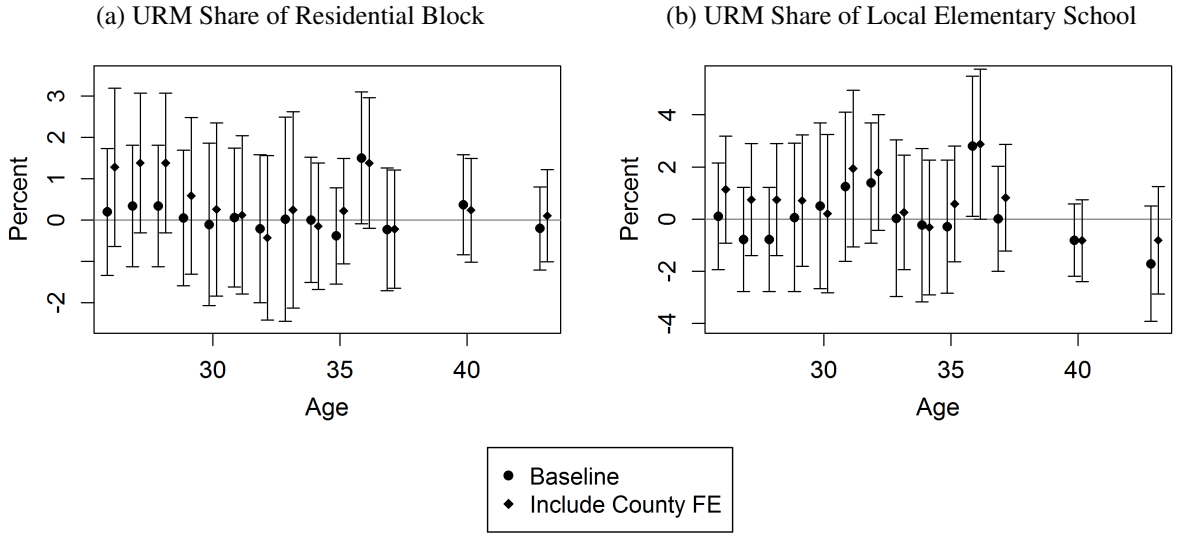
Note: The annual share of non-URM freshman UC students' class peers and floormates who are URM and the share of non-URM freshman UC students with a URM roommate by UC starting year. The vertical line denotes the cessation of affirmative action at UC. The URM share of class peers is measured as the average URM share of enrollees in completed courses. URM roommates and floormates are conditional on residing in campus housing; floormates are defined as other students living on the same floor of the dormitory or, for residents of multi-bedroom suites, the other residents of the suite. URM includes Black, Hispanic, and Native American students. Source: UC-CHP Student Database (Bleemer, 2018) and the Berkeley Housing Office.

Figure 3: The Effect of Undergraduate Affirmative Action on Residential Integration



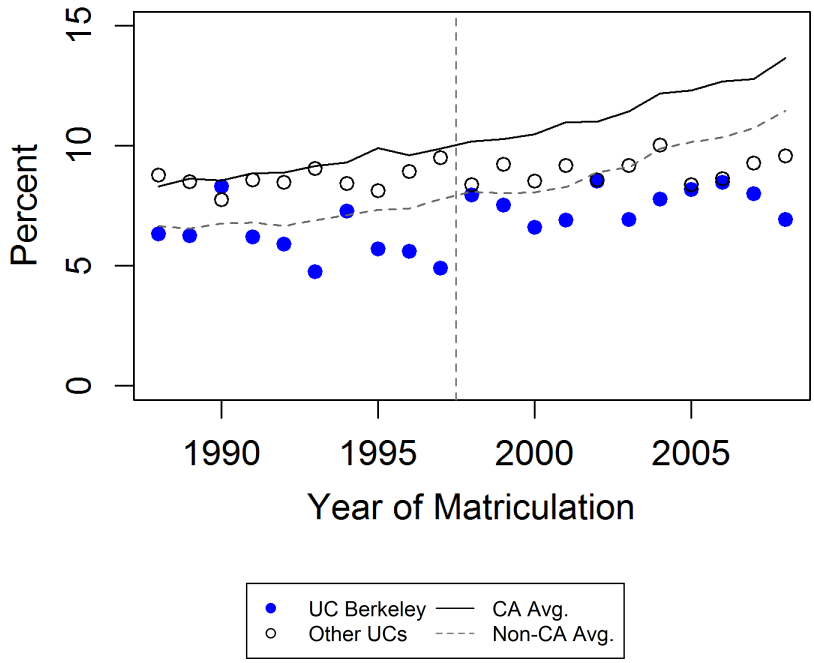
Note: The average URM share of 2023 residential blocks or local elementary schools of non-URM freshman male UC students or male state residents, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. An individual's elementary high school is the closest public elementary school to the student's Census block centroid, excluding charter, magnet, and virtual schools. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and the California Department of Education.

Figure 4: The Effect of Undergraduate Affirmative Action on Residential Integration by Age



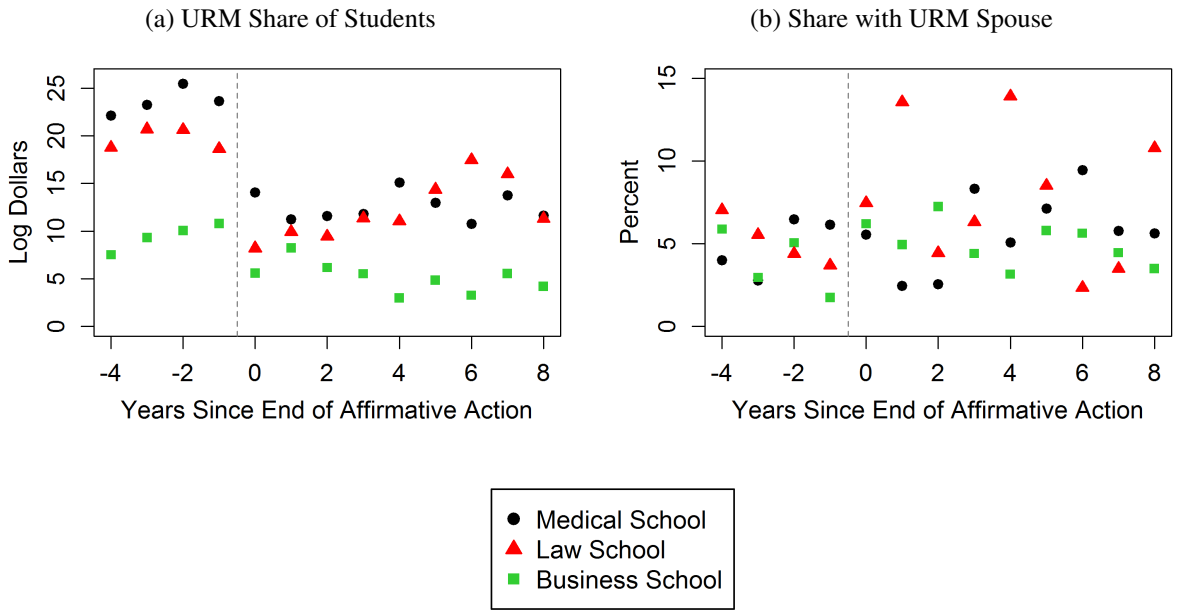
Note: Estimates of β and 95-percent confidence intervals from separate OLS regressions estimating Equation 2 comparing UC Berkeley to the other less-selective UC campuses or to all non-UC California voters, and where Y_{it} is defined as (a) the URM share of i's residential Census block or (b) the URM share of the closest public elementary school to i's residence, with residential blocks measured among matched California registered voters in 2006-2017, 2020, and 2023 (when 1998 freshman enrollees are approximately aged 26 to 43). URM residential shares are measured in 2010 (2006-2014) or 2020 (2015-2023); URM elementary school enrollment shares are measured in 2022. Standard errors are robust. Source: UC-CHP Student Database (Bleemer, 2018), the California Secretary of State, the US Census, and the California Department of Education.

Figure 5: The Effect of Undergraduate Affirmative Action on Interracial Marriage



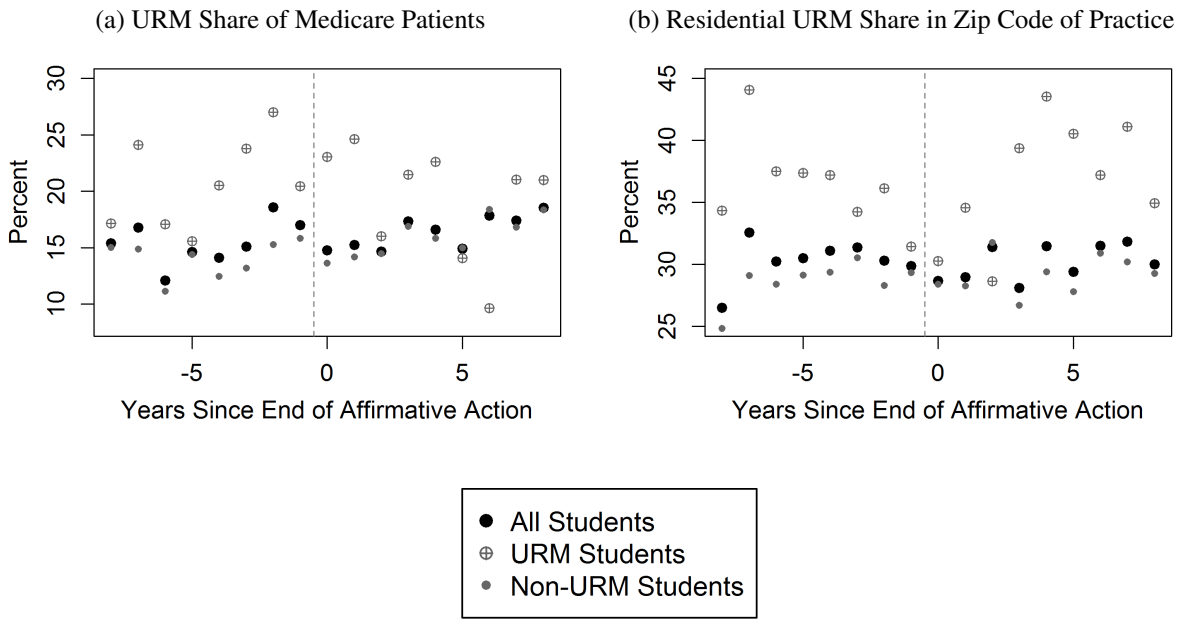
Note: The share of non-URM freshman male UC students or male state residents who were married to a URM spouse in 2023 by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

Figure 6: The Effect of Affirmative Action on Interracial Marriage at Graduate Schools



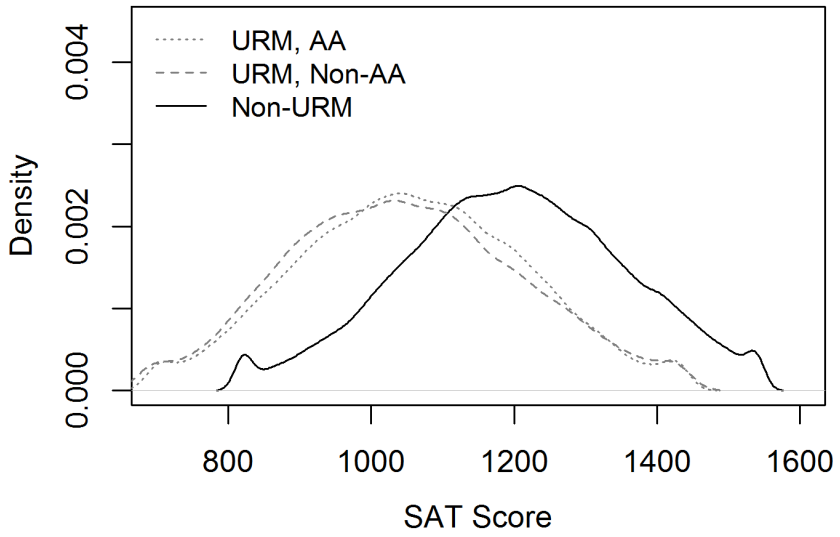
Note: The share of male UC graduate medical, law, and business students who were URM or the non-URM share who were married to a URM spouse in 2023 by cohorts before and after each respective school's cessation of race-based affirmative action. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address. URM includes Black, Hispanic, and Native American students; spousal race is predicted by L2. Included medical schools (and years of affirmative action cessation, measured by largest 1994-1998 annual URM enrollment decline) are Davis (1994), Irvine (1995), and San Francisco (1997); law schools are Berkeley (1997), Davis (1995), and Irvine (1994); business schools are Berkeley (1997) and Davis (1996). Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

Figure 7: The Effect of Affirmative Action at Medical Schools on Patient Diversity



Note: The average URM share of UC graduate medical students' 2013-2023 Medicare patients or residents of their 2023 Zip code of practice by cohorts before and after each respective school's cessation of race-based affirmative action and by whether the student is URM. Included medical schools (and years of affirmative action cessation, measured by largest 1994-1998 annual URM enrollment decline) are Davis (1994), Irvine (1995), and San Francisco (1997). Medicare patient characteristics are averaged across years in Zip codes of practice are observed (in order of priority) in CMS records, the NPPES enumeration file, the Medical Board of California, and Doximity. Primary care physicians practice family medicine, internal medicine, OB/GYN, pediatrics, or general practice. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database. UC Davis students are not observed prior to 1990 (years before $t = -4$). Source: UC-CHP Student Database (Bleemer, 2018), 2020 5-Year American Community Survey, Medical Board of California, and Doximity.

Figure 8: Distribution of SAT Scores by URM Status at UC Berkeley



Note: The distribution of SAT scores of 1994-2007 UC Berkeley freshmen by URM status and (for URM students) whether they enrolled before or after Proposition 209 (which affected the 1998-2007 cohorts). SAT scores are renormed to the post-1995 score; they reflect the sum of the math and verbal scores and are out of 1600. Source: UC-CHP Student Database (Bleemer, 2018).

Table 1: Descriptive Statistics

	Non-URM Students			URM Students		
	'95-'97	'98	'99-'01	'95-'97	'98	'99-'01
Panel A: UC Berkeley Students						
Zip Code Avg. Log Income	10.96	10.96	10.96	10.68	10.63	10.63
High School % URM	26.0	26.6	29.1	48.0	47.2	55.0
CA Resident (%)	88.2	86.4	88.0	95.8	95.7	94.2
GPA Fixed Effect	0.55	0.56	0.57	-0.13	-0.02	0.04
Number of Students	5,486	2,016	5,755	1,087	231	758
Panel B: Other UC Students						
Zip Code Avg. Log Income	10.89	10.89	10.89	10.61	10.60	10.57
High School % URM	30.1	30.2	31.1	52.0	53.3	56.7
CA Resident (%)	90.8	89.1	89.6	93.6	94.2	92.6
GPA Fixed Effect	0.08	0.04	-0.00	-0.34	-0.32	-0.41
Number of Students	20,114	7,215	24,699	3,658	1,165	4,257

Note: Mean descriptive statistics of URM and non-URM male freshmen at UC Berkeley and other UC campuses (Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz) in the three cohorts prior to Prop 209, the first cohort without affirmative action, and the three subsequent cohorts. GPA fixed effects are the unshrunken fixed effects from an Abowd et al. (1999)-style decomposition of course GPAs into student and course-term fixed effects estimated *across* UC campuses and years; see Appendix A.

Source: UC-CHP Student Database (Bleemer, 2018), the CA Department of Education, and IRS SOI.

Table 2: Summary of Affirmative Action's Effects on Later-Life Racial Integration

Specification:	Berkeley Only	Bkly vs. Other UC All	Bkly vs. Other UC High-AI	Bkly vs. Whole States CA	Bkly vs. Whole States Non-CA
Panel A: URM Share in Residential Block (%)					
UC Berkeley		-4.29	-6.52	-12.21	-1.84
		(0.51)	(0.77)	(0.50)	(0.48)
UC Berkeley ×	-0.22	0.42	1.25	-0.35	-0.68
Aff. Action	(0.76)	(0.59)	(0.91)	(0.58)	(0.55)
Cohort FE	T.T.	X	X	X	X
Mean of Y	17.9	20.7	21.3	31.2	20.7
St. Dev. of Y	15.9	17.3	17.5	22.8	18.7
Number of Obs.	5,708	20,372	16,160	391,864	365,389
Panel B: Share with URM Spouse (%)					
UC Berkeley		-0.44	0.49	-2.04	-0.10
		(1.09)	(1.86)	(0.95)	(0.91)
UC Berkeley ×	-3.35	-3.03	-6.17	-1.68	-1.59
Aff. Action	(1.49)	(1.23)	(2.03)	(1.06)	(1.02)
Cohort FE	T.T.	X	X	X	X
Mean of Y	6.1	8.0	8.4	8.9	6.8
St. Dev. of Y	23.9	27.2	27.8	28.5	25.2
Number of Obs.	3,283	11,874	9,465	226,195	185,368

Note: OLS regressions of the URM share of 2023 residential block or an indicator for being married to a URM spouse in 2023 on whether the person attended UC Berkeley and whether it was prior to 1998 (when the university ended race-based affirmative action), across various non-URM freshman male samples among 1995-1998 cohorts defined either by first year of enrollment or, for non-students, birth year plus 18. The first column shows single-difference estimates controlling for a cohort trend. The second and third columns show diff-in-diff estimates relative to other UC campuses, with cohort fixed effects and either overall or restricting Berkeley students to those with a Berkeley Academic Index of at least 7,500 (indicating that the students would be consistently near-guaranteed admission). The fourth and fifth columns show diff-in-diff estimates relative to residents of California or other states, omitting all other matched UC students from the resident sample. Regressions include a cohort trend (T.T.) or fixed effects (X). URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

Table 3: Within-Campus Affirmative Action Effects on Later-Life Racial Integration

Var:	High-URM Major			Low-URM High School		
Sample:	Berkeley	UC	UC	Berkeley	UC	UC
Panel A: URM Share in Residential Block (%)						
Aff. Action	-0.30			-0.78		
	(1.51)			(1.42)		
UC Berkeley × Aff. Action		-0.71			0.23	
		(1.16)			(1.08)	
Var × UC Berkeley × Aff. Action			-1.96			0.15
			(1.46)			(1.74)
Cohort FE	T.T.	X		T.T.	X	
Cohort-Campus FE			X			X
Mean of Y	19.8	21.6	20.7	16.1	17.9	20.7
St. Dev. of Y	16.5	17.6	17.3	15.1	15.4	17.3
Number of Obs.	1,556	5,321	13,155	1,381	5,149	10,072
Panel B: Share with URM Spouse (%)						
Aff. Action	-4.02			-1.31		
	(3.07)			(2.45)		
UC Berkeley times Aff. Action		-1.45			-0.18	
		(2.45)			(1.95)	
Var × UC Berkeley Aff. Action			0.59			1.98
			(3.09)			(3.49)
Cohort FE	T.T.	X		T.T.	X	
Cohort-Campus FE			X			X
Mean of Y	7.5	8.8	8.0	4.7	6.3	8.0
St. Dev. of Y	26.4	28.3	27.2	21.2	24.2	27.2
Number of Obs.	876	3,066	7,709	806	3,063	5,867

Note: Single-, double-, and triple-difference OLS regressions of the effects of enrolling at UC Berkeley under affirmative action on the URM share of 2023 residential block or an indicator for being married to a URM spouse in 2023, measured among two subgroups of non-URM students: students whose declared major was in the top third of majors by URM enrollment and students whose high school was in the bottom third of URM enrollment. Regressions reflect, in order for each Var: (1) single-difference estimates comparing subgroup Berkeley students before and after 1998 (when the university ended race-based affirmative action); (2) diff-in-diff estimates comparing that difference to the same difference at other UC campuses; and (3) triple-difference estimates comparing that difference to the same difference measured among opposite-subgroup students (e.g. students in the *bottom* third of majors by URM enrollment). The samples are drawn from non-URM freshman male students who enrolled at UC between 1995 and 1998. Models include, progressively, a cohort time trend, cohort fixed effects, and cohort-campus fixed effects. Majors' URM shares are calculated by campus in 1995-1997 and terciles are measured within campus; high schools' URM shares are measured among students' imputed sophomore classes (two years prior to application) and terciles are defined within campus-cohort. Regressions include a cohort trend (T.T.) or cohort or cohort-campus fixed effects (X). URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the CA Department of Education, and the US Census.

Table 4: Validity Tests of UC Berkeley Freshman Roommate Lottery

	Assigned URM RM (U_i^A) (%)		Live with URM RM (%)	Parent Inc. (log $)		SAT Score	
URM_i	5.1	0.3					
	(0.9)	(0.8)					
$U_i^A \times (1 - URM_i)$			89.8	0.005	-0.013	-1.0	2.0
			(0.7)	(0.017)	(0.018)	(2.4)	(2.6)
$U_i^A \times URM_i$			83.9	-0.132	-0.061	-33.0	-6.5
			(1.7)	(0.033)	(0.042)	(6.1)	(6.9)
$\hat{p}^U$		83.2					
		(1.7)					
γ_{L_i}	X	X	X	X	X	X	X
Inst. Var.					X		X
Mean of Y	19.9		15.9	11.0		1319	
St. Dev. of Y	40.3		36.6	0.86		137	
Number of Obs.	31,992		31,992	30,558		31,462	

Note: The relationship among 1994-2007 UC Berkeley freshmen of being URM and being assigned a URM roommate (U_i^A), with and without controlling for the simulated likelihood of their being assigned a URM roommate ($\hat{p}^U$); the first-stage relationship between being assigned a URM roommate and actually residing with a URM roommate (separately by URM status); and the estimated balance relationship (following Equation 4) between having a URM roommate and the student's log average parental income or 1600-scale SAT score (separately by URM status). When estimated by "instrumental variables", U_i^A is replaced by the difference between U_i^A and $\hat{p}^U$. 2004-2005 students are omitted due to lottery inconsistencies. URM includes Black, Hispanic, and Native American students.

Source: Berkeley Housing and UC-CHP Student Database (Bleemer, 2018).

Table 5: UC Berkeley Freshman Roommates and Racial Integration

	URM Share in Residential Block (%)			URM Share in Elem. Sch. (%)		URM Spouse (%)		Republican (%)	
***Panel A**: Non-URM Students*									
U_i^A	1.3	0.4	0.3	2.1	1.3	-0.3	-0.3	-1.1	-1.6
	(0.5)	(0.6)	(0.5)	(0.8)	(0.9)	(1.0)	(1.2)	(0.8)	(0.9)
Mean of Y		19.1			36.3		6.8		7.9
St. Dev. of Y		16.5			25.6		25.1		27.0
Number of Obs.		10,109			8,087		5,469		10,316
***Panel B**: Non-URM Students by URM Roommate Above/Below SAT Median*									
$U_i^{A,Above}$	1.9	1.1	1.1	3.5	2.6	-1.9	-1.9	-0.2	-0.5
	(0.6)	(0.7)	(0.6)	(1.0)	(1.1)	(1.1)	(1.3)	(0.9)	(1.0)
$U_i^{A,Below}$	-0.1	-1.1	-1.2	-1.6	-3.3	1.3	0.1	-3.3	-3.6
	(0.9)	(1.1)	(1.0)	(1.5)	(1.7)	(1.9)	(2.1)	(1.2)	(1.3)
***Panel C**: URM Students*									
U_i^A	9.5	7.5	6.7	8.5	6.2	9.2	3.8	1.2	1.6
	(1.9)	(2.7)	(2.6)	(2.4)	(3.8)	(5.2)	(6.7)	(1.8)	(2.7)
Mean of Y		35.9			53.2		50.0		5.7
St. Dev. of Y		27.4			29.4		50.0		23.1
Number of Obs.		1,488			1,220		778		1,517
γ_{L_i}	X	X	X	X	X	X	X	X	X
Inst. Var.		X	X		X		X		X
2023 County FEs			X						

Note: The estimated effect (following Equation 4) of 1994-2007 non-URM male UC Berkeley freshmen having a URM roommate (U_i^A) on the average URM share of their 2023 residential block, the nearest public elementary school to their 2023 residence, whether they are married to a URM spouse in 2023, or whether they are registered as a Republican. When estimated by "instrumental variables", U_i^A is replaced by the difference between U_i^A and $\hat{p}^U$. 2004-2005 students are omitted due to lottery inconsistencies. URM includes Black, Hispanic, and Native American students; spouses' races are predicted by L2.

Source: Berkeley Housing, UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and IRS SOI.

Online Appendix

Affirmative Action and Racial Integration

Zachary Bleemer and Gerald Jaynes

March 2026

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Appendix A: Data Appendix

This study combines a series of administrative datasets to study the long-run effects of racial integration and cross-race academic match in higher education on the racial integration and cohesion outcomes of young white and Asian Americans. This section discusses each dataset in turn.

A.1 University of California administrative data

Our base dataset includes student administrative records for seven University of California campuses – those at Berkeley, Davis, Irvine, Riverside, San Francisco, Santa Barbara, and Santa Cruz – for all undergraduate and graduate enrollees whose initial year of enrollment was between 1988 and 2008. These records were obtained separately from each campus's Office of the Registrar – with additional records provided by the University of California Office of the President – and combined into a comprehensive UC database by Bleemer (2018). The data consist of two files. The first file contains a row for each student-degree (where degree is either 'undergraduate' or a specific graduate Masters, PhD, or professional degree track) and includes each student's name and birth date (identifying information used for matching but deleted prior to analysis), cohort year, gender, self-reported race, home Zip code, high school, and declared majors.[28] The second file contains a row for each 1988-2015 student-course enrollment for all students in the first file and includes the year, term, department, course number, and grade earned.

Students self-report binary gender and a single ethnicity in each year; ethnicities are aggregated into Black, Hispanic, Native American, Asian, white, other, and no response and then further aggregated into URM and non-URM, where URM includes Black, Hispanic, and Native American.[29] Home Zip code is the first Zip code that the student registers with the university's Office of the Registrar and is generally the address reported on the student's application. Students' high schools are only consistently available starting in 1994, are only available for public and private California high schools, and are provided as six-digit CEEB codes.

We distinguish between freshman and transfer students based on age: students who turn 20 prior to October of their enrollment year are classified as freshman and all other students are classified as transfers.[30] Our analysis is restricted to freshman students since their admission was relatively more impacted by Prop 209. For only UC Berkeley students, we observe an indicator of whether each 1995-2000 student has a sufficiently high academic index – a linear combination of SAT I and II scores and high school GPA – as to be effectively guaranteed admission to that campus, permitting analysis restricted to that sample of students.

[28] Cohort year is not available from Santa Barbara; we use first year of course enrollment instead.

[29] Appendix D.1 of Bleemer (2022) shows that nearly all of the 5-10 percent of students who do not report race are non-URM.

[30] Figure A-29 of Bleemer and Mehta (2021) shows that this rule minimizes misclassification error but results in the misclassification of 1.9 (5.6) percent of freshman (transfer) students.

We identify 'high-URM' majors as being the undergraduate majors at each UC campus in the top and bottom cross-major tercile of 1995-1997 URM enrollment shares (weighting majors by number of students) among first declared majors (that is, omitting second and third majors), including freshman and transfer students and restricting to majors with at least 30 enrollees in the period.

A.2 Voter Registration Data

A.2.1 US Voter Registration Data

We construct a comprehensive database of all US voters using the 50-state L2 voter registration database, which is available for purchase from that firm. Our version of the L2 database is from August 2022. The L2 database includes each voter's name and birth date, residential address, longitude/latitude, 2020 Census block, imputed gender and ethnicity, registered political party, participation indicators for each regular and primary election since 2010, whether those votes were in-person or by mail, and indicators for whether the household has "an interest in domestic travel" or "an interest in international travel".

We impute spouses in the US voter registration data if a voter resides at the same address as exactly one other voter with a birth year within 15 years of their birth year, resulting in a spousal match rate of about 65 percent among matched male UC students in the mid-1990s (Figure A-2(c)). About 90 percent of those matches are to women. L2 imputes gender and ethnicity using past and current first, middle, and last names (Rosenman et al., 2023); spouses with unknown ethnicity are omitted. See Appendix C for information about imputation effectiveness. L2's imputation of interest in domestic and international travel is proprietary but is primarily based on observed household magazine subscriptions.

Voter participation in the November 2020 presidential election is observed. We also predict 2020 voter participation by voter participation in the 2016-2019 main and primary elections and whether or not participation in each of those elections was by mail or in-person. The OLS regression has an R^2 of 0.28. We define "Voted in 2020 Relative to Predicted Voting" as the residual from this regression.

We define the 'ten-year change in Block's non-URM share' as the difference between the 2020 non-URM share of the 2020 Census Block in which the person resides and the 2010 non-URM share of the 2010 Census Block in which they reside. We define 'Gentrifying Blocks' as those Blocks where the 2020 non-URM share is higher than the 2010 non-URM share. We define 'Independents' as anyone who is not registered as either a Democrat or a Republican.

We match student and voter records by name and birth date. Names are standardized in lowercase with all non-letter characters deleted. About 60 percent of unique matches (male and female) match on first, middle, and last name and birth date. Another 36 percent match when the criteria

are limited to middle initial or non-contradictory middle initial (if one of the two records does not include a middle name). Allowing matches where the student last name matches half of a hyphenated last name in the voter registration data results in the remaining matches. If an individual matches multiple records in different states, then a California match is prioritized; if there is no California match or multiple matches in the same state, the individual is excluded.

In total, about 75 percent of late-90s male UC students uniquely match to the voter registration records, with another 5 percent being non-citizens unlikely to be eligible to vote. Remaining unmatched students either match too many voters to link to the registration database (as described in the previous paragraph) or are not registered to vote in the US.

All voters are matched to their 2010 Census block using their latitude/longitude and Census TIGER shapefiles.

A.2.2 CA Voter Registration Data

We also link each UC student to the annual California voter registration datasets from 2006-2017, 2020, and 2023. These datasets were obtained directly from the California Secretary of State, in some cases with L2 as the intermediary. Each annual voter registration database includes registered California voters' name and birth date, residential address, and registered political party. We geolocate each residential address to latitude/longitude using a 2023 North America geocode database (with about 2 percent of students' addresses unmatched) and then geolocate each latitude/longitude into its 2010 and 2020 Census block using Census TIGER shapefiles. We match students to each annual voter registration database separately using the same algorithm described in the previous subsection.

A.3 LinkedIn data

We purchased a 2019 LinkedIn profile dataset for any individual whose name, university, and cohort ($+/-$ one year) uniquely match a UC student and who reports having earned an undergraduate or graduate degree from a UC campus from a third-party data provider. Only about one-third of late-90s male students match to an available LinkedIn profile. We restrict to employment spells that include at least one year between 2015 and 2019 and observe whether the student was employed at a firm categorized (out of 353 available industry categories) as being in the following 'public service' industries: International Affairs, Primary/Secondary Education, Law Enforcement, Civic & Social Organization, Government Administration, Nonprofit Organization Management, Government Relations, and Legislative Office.

A.4 Medical data

A.4.1 National Student Clearinghouse

We identify UC students who become doctors by first linking each University of California to their National Student Clearinghouse (NSC) record, which uses a proprietary algorithm to link students by name and birth date and provides enrollment institutions, terms of enrollment, and degrees for all US medical schools.[31] Any student who is reported by the NSC to have earned a medical degree (including both M.D. and D.O.) or who spent at least five semesters enrolled in medical school – which helps identify graduates of the small number of medical schools that do not report degrees to NSC – is identified as a doctor, and their year of degree attainment is defined as either their degree year or their first year of enrollment plus four. We augment NSC for the small number of students who are omitted from NSC but earn medical degrees from the three medical schools with observed records in our database (Davis, Irvine, and San Francisco).

A.4.2 Medical Board of California

The 2021 Medical Board of California (MBC) licensure database contains the full name, medical school attended, year of medical school graduation, Zip code of practice, and up to five subfields of practice for every doctor licensed to practice medicine in California, which includes many doctors not presently practicing in California. The MBC also conducts regular surveys of licensed doctors with very high response rates, including a question of whether the doctor can speak professional Spanish or any other non-English language.

We link each UC-trained doctor to the MBC licensure database by full name (including maiden name), year of graduation, and medical school. We allow matches on only middle initial and up to two years variation in year of medical school graduation (due to misreporting to either NSC or the MBC), and also allow for flexibility with missing middle names, hyphenated last names, maiden names, and nicknames.

A.4.3 Doximity

Doximity is a popular medical social network for US doctors. Most US doctors have a public profile – generally personally curated, but sometimes curated by patients or others – that contains doctors' full name, undergraduate and graduate school degrees and years, residency and other medical training programs completed (with years of completion), a single medical subfield of practice, office address, and considerable additional information.[32]

We link each UC-trained doctor to their Doximity profile by full name (including maiden name where available), year of graduation, and medical school. Some doctors have multiple Doximity

[31] A small share of students mask their records and are unobservable in NSC; see Dynarski et al. (2015).
[32] A typical profile is available at this website.

profiles, likely by mistake; if they share all of these categories, we maintain the more-complete profile. We allow matches on only middle initial and up to two years variation in year of medical school graduation (due to misreporting to either NSC or the MBC), and also allow for flexibility with missing middle names, hyphenated last names, maiden names, and nicknames.

A.5 Other administrative datasets

We match each student's home Zip code to the average adjusted gross income of 1998 federal tax filers in that Zip code using data from the Internal Revenue Service's Statistics of Income dataset.

The California Department of Education (CDE) publishes the racial breakdown of enrollees at each California public elementary and high school annually since 1996. We define the racial composition of each UC enrollee's high school by the share of students two years later (allowing us to define outcomes back to 1994) who were Black, Hispanic, or Native American, which covers the high schools of 76 percent of freshman UC students. We identify 'low-URM' high schools as being the high schools at each UC campus in each cohort in the top and bottom UC student-weighted tercile of high schools.

The CDE also publishes the latitude/longitude of each 2022 public elementary and high school in California. We identify the closest public elementary and high school to each 2020 California Census block (by haversine Great Circle distance), excluding charter, magnet, and virtual schools. We then measure the URM share of each block's nearest elementary and high school as the share of 2022 students at that nearest school who are Black, Hispanic, or Native American.

We match each Census tract and block to the average URM share of residents of that tract or block using Black, Hispanic, and Native American residential shares in the 2010 Census (for the 2006-2014 California voter registration records and 2022 US voter registration records) or the 2020 Census (for the 2015-2023 California and 2022 US voter registration records).

We match each doctor's Zip code of practice – defaulting to MBC if Zip codes are available from both MBC and Doximity, and using whichever is available otherwise – to its average URM share of residents in the 2020 5-year American Community Survey, available from the US Census.

Appendix B: GPA Fixed Effects and Academic Performance

We estimate the relative academic performance of UC students by using a two-way fixed effect estimator mirroring the Abowd et al. (1999) decomposition of wages into individual and firm effects. We assign each student-course pair the GPA associated with their letter grade in the course – omitting student-course pairs in which no letter grade was earned – and then estimate the following linear regression:

$$GPA_{ic} = \alpha_i + \gamma_c + \epsilon_{ic} \tag{BB-1}$$

Table BB-1: Student Overlap Between UC Campuses

	Berkeley	Davis	Irvine	Riverside	Santa Barbara	Santa Cruz
Berkeley	140,958					
Davis	467	93,185				
Irvine	583	205	103,266			
Riverside	327	256	740	73,108		
Santa Barbara	613	484	500	601	112,017	
Santa Cruz	493	193	182	198	461	65,235

Note: This figure shows remarkable connectedness between UC campuses in terms of the number of undergraduate students who complete classes at each pair of campuses, legitimizing cross-year and cross-campus AKM-style estimation of student GPA fixed effects. The number of students in the full 1988-2008 database who complete at least one course at each of the two campuses on the x- and y-axes. Students are linked by exact first and last name and birth date.

Source: UC-CHP Student Database (Bleemer, 2018).

where the $gamma_c$ fixed effects capture mean grading differences in course c – where course is defined by campus-course-term, so these absorb course-specific features like different standards in different disciplines or from different professors – and the α_i individual fixed effects reflect the average academic performance of student i in their classes. Because most students take dozens of classes while enrolled at UC, these fixed effects are identified over highly-connected sets of students in nearby cohorts. We assign each student to their estimated fixed effect (without shrinkage) as their estimated level of relative collegiate academic performance, demeaning the estimates over the full student dataset so that 0 is interpretable.

Crucially, however, we estimate this model not only across our entire 20-cohort dataset – such that while the entire network is densely connected, there are many students who never take any courses together (since they enroll as many as 20 years apart), but also across undergraduate and graduate students and across the seven UC campuses. Comparisons between the estimated α_i values of these groups requires that the students who switch between these groups – for example, the students who take classes at two different UC campuses – representatively reflect their academic capabilities at both campuses. While a large literature investigates the role of thin connectedness in AKM wage decompositions and generally finds evidence of estimate consistency despite relatively limited connectedness in that setting, a helpful feature of course data is that a relatively large number of students switch between programs and campuses in our sample period. Table BB-1 shows that when students are linked across campuses by exact name and birth date, many hundreds of 1988-2008 students ever enroll at each pair of UC campuses with undergraduate programs. Some of these students transfer between campuses as undergraduates, while others complete their undergraduate training at one campus and enroll as graduate students at the other campus. As a result, we treat the estimated fixed effects as successfully approximating students' academic performance across UC campuses.

Table 1 presents summary statistics of the resulting estimated effects that match reasonable

Table CC-1: Comparison of Racial Identifiers in L2 with Self-Reported UC Ethnicity

	Imputed Race in L2 Voter Record					
	Black	Hispanic	White	Asian	Unknown	All URM
Student Race						
Black	60.1	1.4	5.5	1.3	4.4	8.8
Hispanic	3.0	76.5	5.7	1.1	6.0	67.2
White	23.0	4.2	70.0	8.3	61.6	6.6
Asian	5.6	12.8	6.8	80.4	15.5	11.9
Unknown	8.3	5.1	11.9	8.8	12.4	5.5
All URM	63.1	77.9	11.2	2.5	10.4	76.0
# Obs.	6,971	47,913	148,592	107,591	29,364	54,884

Note: The share of students in each L2-imputed racial group who are in each self-reported racial group in University of California administrative records, among 1988-2008 UC students uniquely matched to L2 by name and birth date. Native American is included in Black. Columns sum to 1 excluding URM, which combines the Black and Hispanic columns.

Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

priors: for example, UC Berkeley students tend to have higher fixed effects than students at other UC campuses, non-URM students tend to have much higher fixed effects than URM students, and students' effects are rising over time at UC Berkeley (due to rising selectivity) but falling over time in the rest of the UC system (as the less-selective campuses expand to enroll a broader set of students).

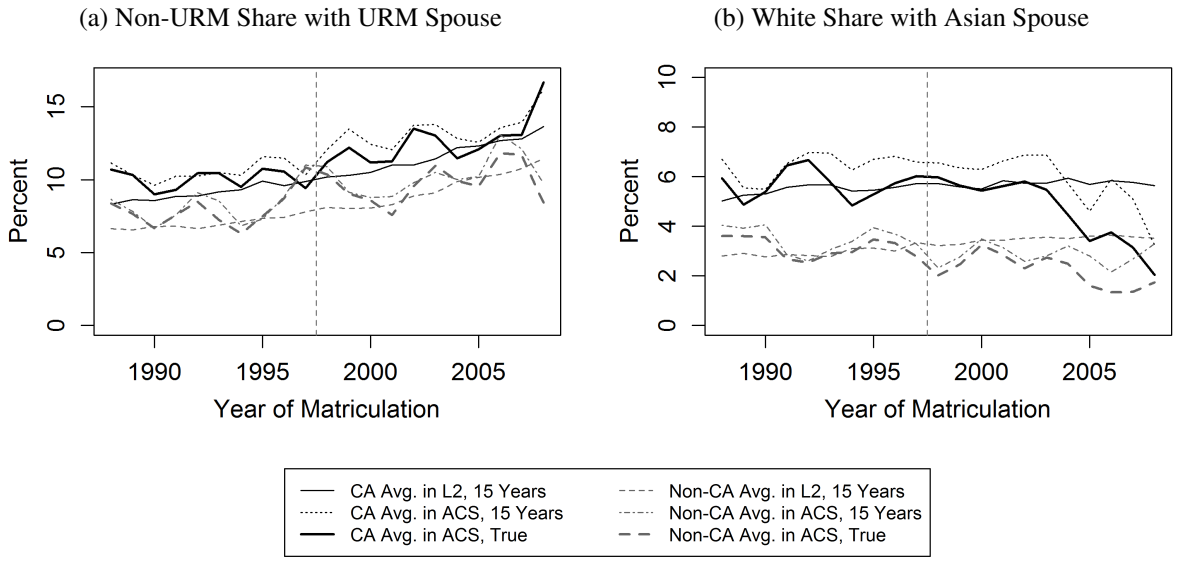
Appendix C: External Validation of L2 Spousal Ethnicities

As discussed in Appendix A.2.1, the spousal ethnicities of L2 participants are measured by imputing both spousal matches (by coresidence and age) and spousal ethnicities (by past and current full name). We impute that someone is person i's spouse if they are the only registered voter who resides at the same address as i within 15 years of i's age, choosing 15 because it exactly maximizes the area under the Receiver Operating Characteristic (ROC) curve designed to minimize types 1 and 2 error in the 2021 American Community Survey (where coresidence and spousal match are both observed).[33] The resulting Type 1 and 2 error rates in the ACS are 21.6 and 5.8 percent. We do not consider gender in assigning matches, and 11 percent of male UC matches' spouses – who first enrolled at UC in 1988-2008, and thus who are about age 32-52 in 2022 – are male. Mismatched spouses are mostly likely roommates or siblings.

Race imputation is conducted by L2. Figure CC-1 shows that overall race Types 1 and 2 error rates are 24 and 32 percent, where the latter excludes unknown voter race records (which are omitted from measurement of interracial marriage). Imputed race is poorest for Black voters and

[33]Bleemer et al. (2021, 2017) similarly choose 15 as the appropriate age to identify matched spouses.

Figure CC-1: Comparison between L2 and ACS Interracial Marriage Rates

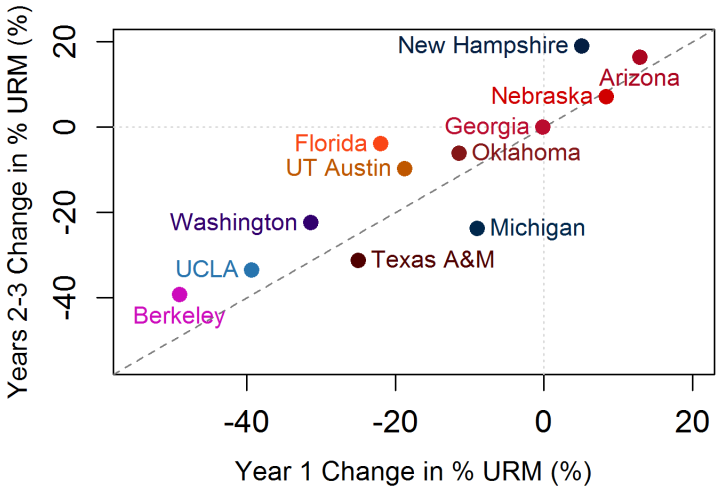


Note: The share of California or non-California non-URM (or white) males with URM (or Asian) spouses by imputed year of matriculation (which is birth cohort + 18) among registered voters and among respondents to the 2021 American Community Survey, where 'spouses' are defined as either directly-observed spouses ('True') or as the only coresident within 15 years of the person's age ('15 Years'). URM includes Black, Hispanic, and Native American individuals; in the L2 data, race is imputed by L2. 'Non-California' includes Arizona, Nevada, Oregon, and Washington. The vertical line denotes the cessation of affirmative action at UC. Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

substantially better for Hispanic voters; 76 percent of voters determined to be URM are categorized as such in their matched UC records.

Figure CC-1 shows how aggregate interracial marriage rates differ between the ACS and L2 in California and in the bordering states ('non-CA': Arizona, Nevada, Oregon, and Washington). In the 2021 ACS, about 10 percent of non-URM Californians in the 1970 birth cohort (with 1988 expected college matriculation years) had URM spouses, with that share rising to about 15 percent by the 1990 birth cohort. When spouses are defined using the L2 definition (the only coresident within 15 years of age), the levels appear to be slightly lower by 1-2 percentage points. When measured in the L2 data, however, the levels appear to almost exactly match the true ACS URM spousal match rate. The same pattern holds in non-CA states, albeit at lower levels of URM spousal match rates. Panel (b) shows that L2 slightly over-estimates California white-Asian intermarriage rates in the 1980s birth cohorts, but the gap is smaller than 1 percentage point for most of the estimation period. The resulting close comparisons suggest that double-imputed marriage patterns identified in L2 appear closely linked to the true marriage patterns documented in the ACS.

Figure DD-1: The Immediate and Longer-Run Enrollment Effect of Affirmative Action Bans



Note: The percent change in the average URM enrollment share of first-time full-time freshman students at flagship public universities in the first year and 2-3 years following their respective state's affirmative action ban, relative to the same average URM share 1-2 years before the ban's implementation. URM includes Black, Hispanic, and Native American students. See the text for each state's year of ban implementation. Source: IPEDS.

Appendix D: Heterogeneity in the Enrollment Effects of Affirmative Action Bans

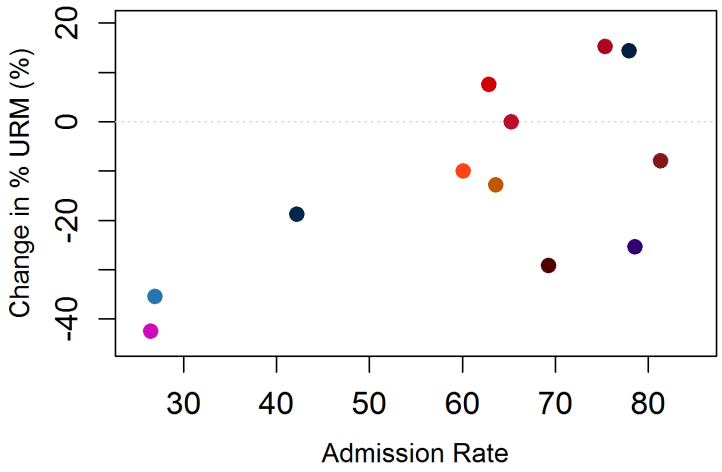
Some – but not all – flagship public universities in states that have imposed AA bans have seen declines in URM enrollment. The effect of AA bans on the racial composition of all but the state's most selective universities is generally negligible due to the cascade effect.[34] Figure DD-1 shows the immediate and medium-run effect of AA bans on the URM share of undergraduates at public flagships in the states that have implemented AA bans. For example, the share of freshman students at Berkeley who were Black, Hispanic, or Native American fell from 21.5 percent in 1996-1997 to 10.9 percent in 1998, a decline of about 50 percent.[35] The largest proportional URM enrollment declines in the first year following their state's AA bans occurred at Berkeley, UCLA, and the University of Washington, with respective declines of approximately 50, 40, and 30 percent.[36] Several institutions saw declines between 10 and 25 percent, while a number of other institutions saw no effect on URM enrollment, or even small positive effects likely generated by spurious

[34] URM students excluded from the most selective universities 'cascade' to enrollment at universities one selectivity tier down, causing URM enrollment gains that offset those universities' losses following their own cessation of race-based preferences (Conrad and Sharpe, 1996; Bleemer, 2022). Black and Hispanic enrollment tends to slightly rise at less- and non-selective institutions. AA bans also cause declines in URM enrollment at graduate schools (Ly et al., 2022; Brooks et al., 2024).

[35] Bleemer (2022) shows that AA bans lead many applicants to not report their ethnicity on their application, though nearly all such students are non-URM.

[36] Arcidiacono et al. (2022) use Harvard University admissions data to simulate a 55 percent decline in URM enrollment share absent AA. Harvard's actual enrollment composition this year is presently unavailable.

Figure DD-2: The Enrollment Effect of Affirmative Action Bans by Selectivity



Note: The percent change in the average URM enrollment share of first-time full-time freshman students at flagship public universities in years 1-3 following their respective state's affirmative action ban plotted against the university's admission rate, relative to the same average URM share 1-2 years before the ban's implementation. Admission rates are the overall share of freshman applicants who are admitted and are measured in the year that the ban was implemented. Admission rates are unavailable prior to 2001; earlier years' rates are replaced by the 2001 rate. URM includes Black, Hispanic, and Native American students. See the text for each state's year of ban implementation. Source: IPEDS.

variation or state-wide demographic change.

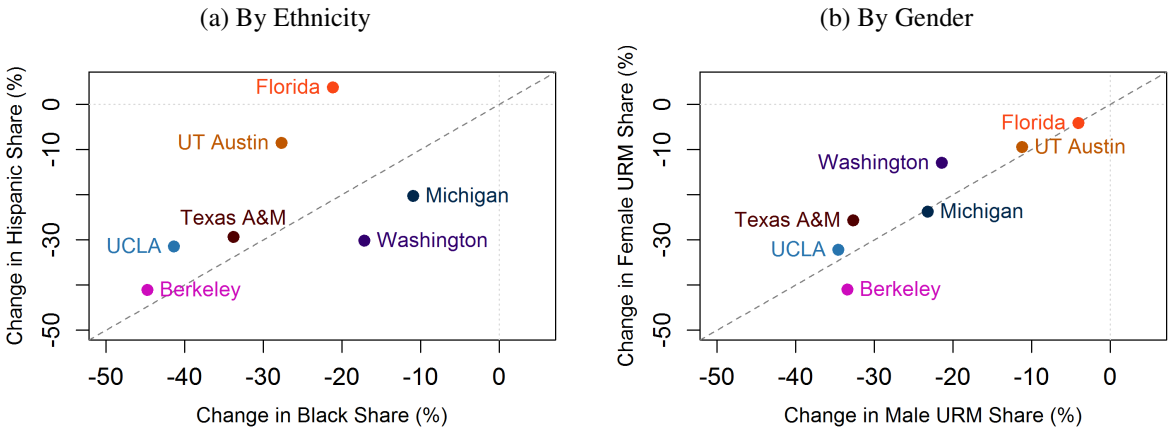
Most universities 'rebounded' from their initial URM enrollment declines in subsequent years. Many of the institutions that recovered the largest shares of their post-ban URM enrollment decline implemented explicit race-neutral alternatives to AA: top percent policies (Texas and Florida) and holistic review (Berkeley).[37] The University of Michigan did not exhaust its legal appeals of the state's AA ban until three years after its initial implementation, during which time the university's URM enrollment share steadily declined. Only Florida regained at least half of its first-year decline in URM enrollment share in the subsequent two years, and URM enrollment at the most-impacted universities hardly recovered further in the subsequent decades (see Long and Bateman, 2020).

Figure DD-3 shows the effect of AA bans on flagship public universities' URM enrollment share by gender and specific ethnicity, focusing on the seven universities where bans led to sizable URM enrollment declines. While AA often provides larger admissions advantages to Black than Hispanic applicants (Bleemer, 2022), only two universities – UT Austin and Florida – saw substantially larger declines in Black than Hispanic enrollment following their AA bans.[38] Michigan and Washington saw larger declines in Hispanic than Black enrollment. Affirmative action bans generally have similar effects on male and female enrollments, though Berkeley's female URM

[37] Berkeley's rebound may have partially resulted from legal pressure from a February 1999 class-action lawsuit filed by the NAACP (Schoenfeld, 2004) leading to changes in the relative weight placed on each component of students' applications (Antonovics and Backes, 2014).

[38] Bleemer (2022) shows that white and Asian enrollments proportionally increased following California's AA ban.

Figure DD-3: The Enrollment Effect of Affirmative Action Bans by Gender and Ethnicity



Note: The percent change in the average URM enrollment share of first-time full-time freshman students at flagship public universities in years 1-3 following their respective state's AA ban among men and women and among Black and Hispanic students, relative to the respective average URM share 1-2 years before the ban's implementation. URM includes Black, Hispanic, and Native American students; separate estimates for Native American students are omitted due to small samples. See the text for each state's year of ban implementation. Source: IPEDS.

share declined by almost 10 percentage points more than its male URM share.[39]

Figure DD-2 shows the relationship between each university's selectivity and the impact of an AA ban on the university's URM share. There is generally a negative relationship: more-selective universities see larger URM enrollment declines following AA bans, likely because those universities required larger race-based admissions preferences to overcome their stronger admission preference for applicants with high measured academic preparation (since URM students are increasingly underrepresented at higher levels of academic performance). The two outliers to this trend – Texas A&M and the University of Washington – have high overall admissions rates but much lower rates in specific STEM- and engineering-oriented fields, suggesting that AA bans led many students to enroll in those disciplines elsewhere.

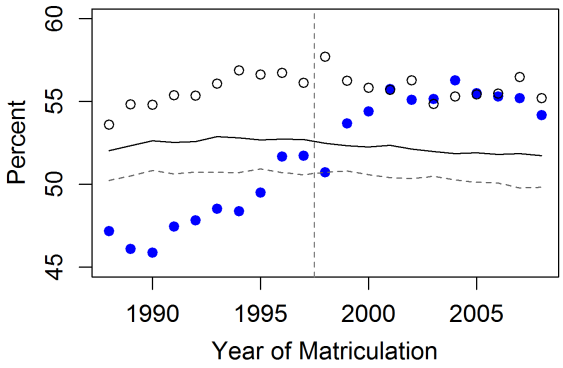
Appendix E: The Effects of Undergraduate Affirmative Action for Female Students

The figures and table in this section show that the main findings – which are restricted to men as a result of the voter registration match rate being substantially lower for women (see Figure A-2) – are mirrored among matched female students.

[39] Antman et al. (2024) document evidence of disproportionate effects of AA bans on female students.

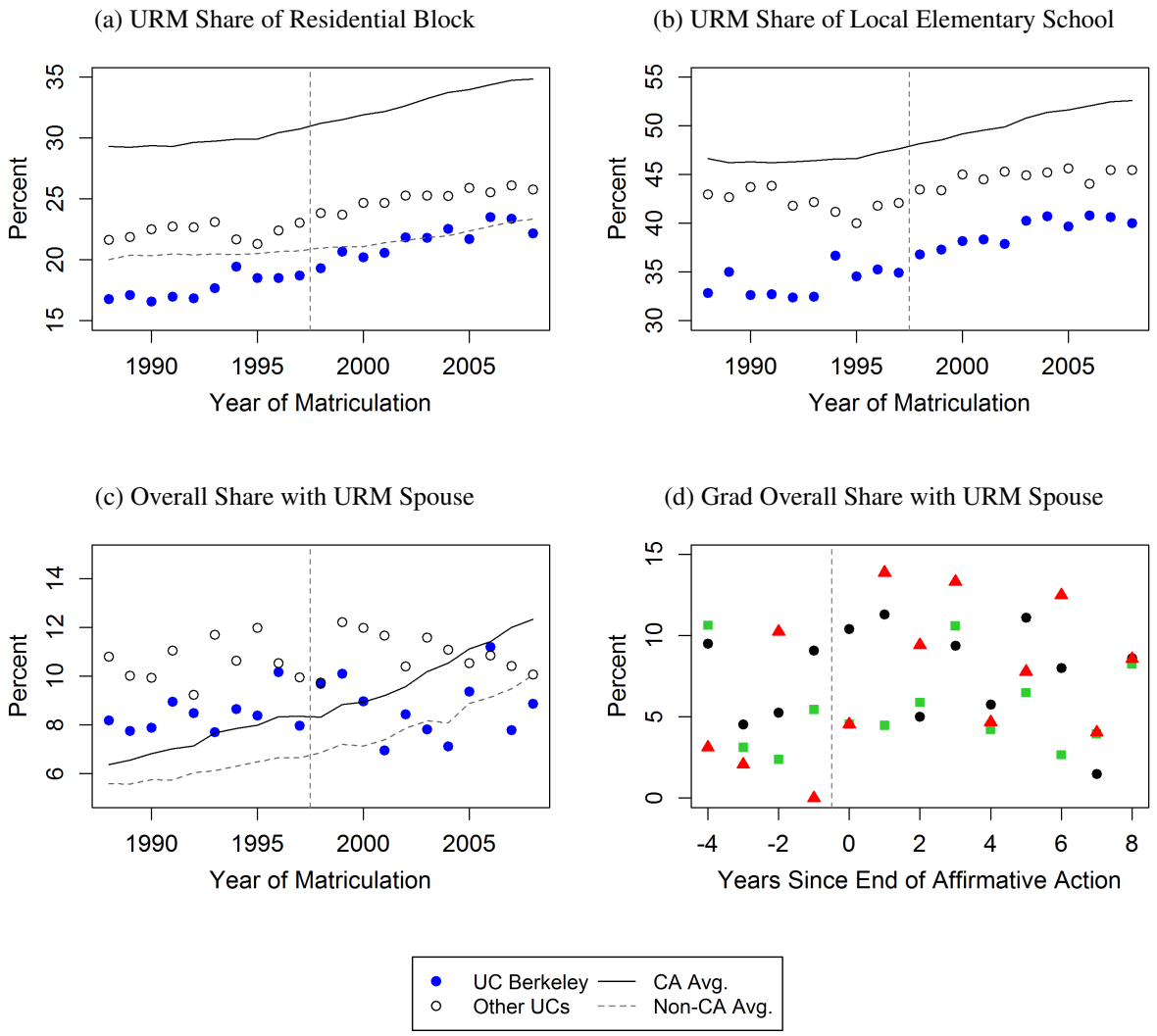
Figure EE-1: The Effect of Affirmative Action on Female Student Enrollment

(a) Overall Share of Female UC Students



Note: Kahlenberg and Potter (2014)

Figure EE-2: The Effect of Undergraduate Affirmative Action on Non-URM Female Students



Note: This figure shows that female students' long-run racial integration follows similar trends to male students' following Prop 209, though interpretation is challenged by their lower matches rates resulting from marriage-related name changes. The average URM share of 2023 residential blocks or local elementary schools of non-URM freshman **female** UC students or male state residents, and their share who were married to a URM spouse in 2023 (conditional on having a spouse), by UC starting year or (for residents) by birth year plus 18, as well as the share of non-URM **female** UC graduate medical, law, and business students who were married to a URM spouse in 2023 by cohorts before and after each respective school's cessation of race-based affirmative action. The vertical line denotes the cessation of affirmative action at UC. An individual's elementary high school is the closest public elementary school to the student's Census block centroid, excluding charter, magnet, and virtual schools. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Included medical schools (and years of affirmative action cessation, measured by largest 1994-1998 annual URM enrollment decline) are Davis (1994), Irvine (1995), and San Francisco (1997); law schools are Berkeley (1997), Davis (1995), and Irvine (1994); business schools are Berkeley (1997) and Davis (1996). Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and the California Department of Education.

Table EE-1: Summary of Affirmative Action's Effects on **Female Students'** Later-Life Racial Integration

Specification:	Berkeley Only	Bkly vs. Other UC All	Bkly vs. Other UC High-AI	Bkly vs. Whole States CA	Bkly vs. Whole States Non-CA
Panel A: URM Share in Residential Block (%)					
UC Berkeley		-4.53	-5.94	-10.61	-0.87
		(0.64)	(1.16)	(0.62)	(0.58)
UC Berkeley ×	-0.52	0.81	1.62	-0.06	-0.23
Aff. Action	(0.98)	(0.74)	(1.37)	(0.71)	(0.67)
Cohort FE	T.T.	X	X	X	X
Mean of Y	18.8	21.7	22.4	30.8	20.7
St. Dev. of Y	16.4	17.9	18.2	22.9	18.8
Number of Obs.	3,756	13,756	10,725	435,686	369,340
Panel B: Share with URM Spouse (%)					
UC Berkeley		-0.05	0.41	0.26	1.64
		(1.54)	(2.80)	(1.22)	(1.19)
UC Berkeley ×	-1.37	-1.83	-5.86	0.16	0.19
Aff. Action	(2.36)	(1.81)	(3.19)	(1.43)	(1.39)
Cohort FE	T.T.	X	X	X	X
Mean of Y	9.1	10.1	10.2	7.4	6.0
St. Dev. of Y	28.8	30.1	30.3	26.1	23.7
Number of Obs.	1,823	6,404	4,957	244,274	184,278

Note: OLS regressions of the URM share of 2023 residential block or an indicator for being married to a URM spouse in 2023 on whether the person attended UC Berkeley and whether it was prior to 1998 (when the university ended race-based affirmative action), across various non-URM freshman **female** samples among 1995-1998 cohorts defined either by first year of enrollment or, for non-students, birth year plus 18. The first column shows single-difference estimates controlling for a cohort trend. The second and third columns show diff-in-diff estimates relative to other UC campuses, with cohort fixed effects and either overall or restricting Berkeley students to those with a Berkeley Academic Index of at least 7,500 (indicating that the students would be consistently near-guaranteed admission). The fourth and fifth columns show diff-in-diff estimates relative to residents of California or other states, omitting all other matched UC students from the resident sample. Regressions include a cohort trend (T.T.) or fixed effects (X). URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

Appendix F: The Effects of Undergraduate Affirmative Action for URM Students

Appendix G: The UC Berkeley Housing Lottery

UC Berkeley assigned first-year students to dormitories via a two-stage housing lottery. Students applied for housing by submitting a detailed form containing four sets of preferences in the May prior to their initial fall enrollment:[40]

1. A rank-order list of their five most-preferred pairings of dormitory location (e.g. Unit 1, Foothill, the all-male Bowles, the all-female Stern, or a substance-free dormitory) and room type (e.g. double, triple, double in a suite).

2. Indicators for whether they would like to live in a theme house – including an African American house, a Chicano house, an Asian Pacific American house, a Gay, Lesbian, Bisexual and Transgender house, and a women-in-STEM house.

3. Binary or ternary preferences over roommates, including: (1) whether the hallway is single-sex; (2) whether the roommate smokes; (3) whether the roommate prefers having a quiet room; (4) how the roommate prefers to use the room (work, social, or both); and (5) whether the roommate wakes up early and/or goes to bed late.

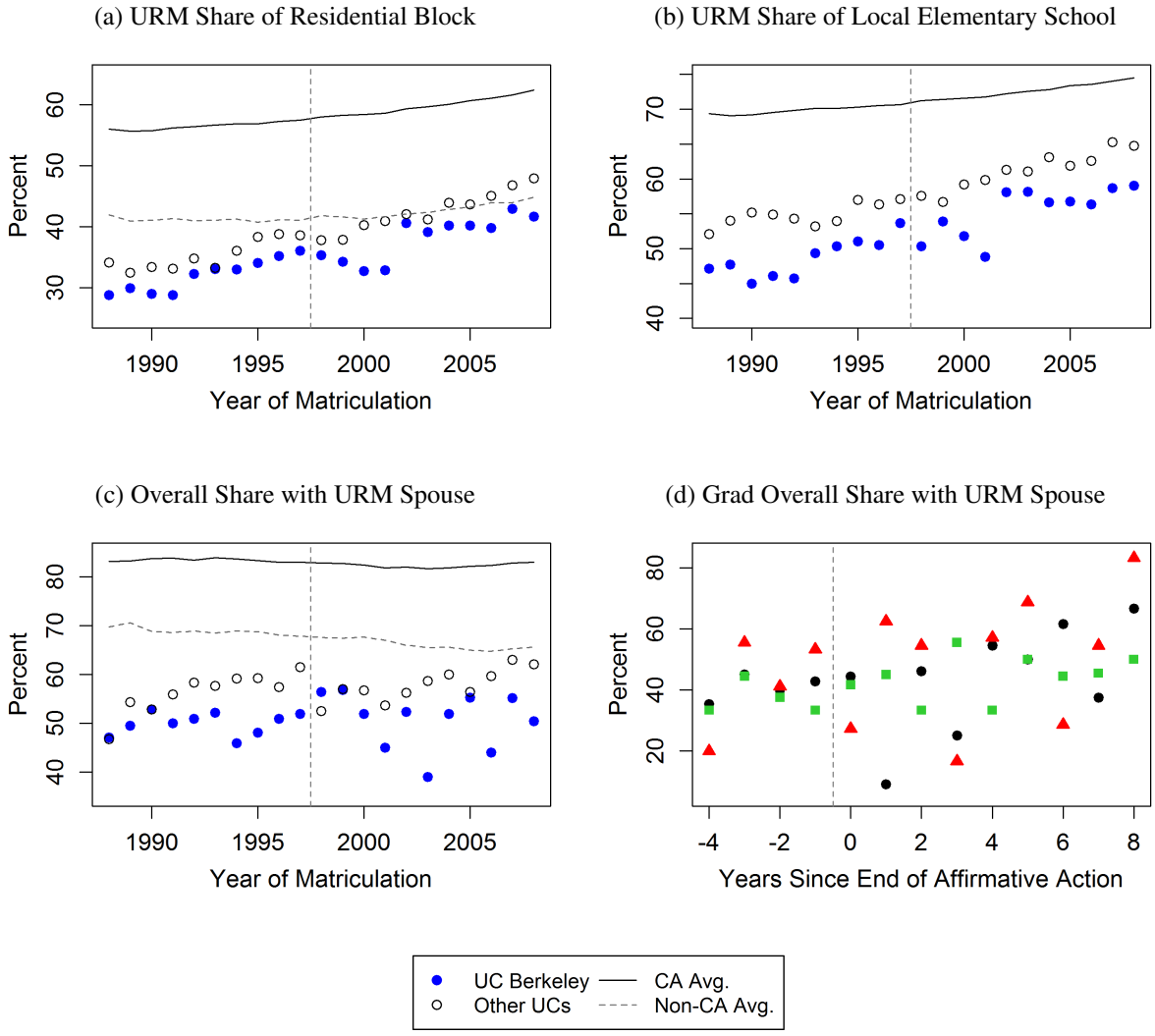
4. The name of one or two roommates with whom the student would prefer to coreside.

Prior to the lottery, continuing (that is, not first-year) students who chose to live in dormitories select their rooms. Students who requested theme housing submit additional application materials and are evaluated for admission, which is provided to a subset. In the lottery's first stage, each first-year student is assigned a random lottery number, and students who select each other as requested roommates are jointly assigned the better of their lottery numbers. Priority is given first to Berkeley Scholars, a university merit scholarship program, and last to students enrolled in Berkeley's extension school. Students are then allocated to building-type pairs by serial dictatorship based only on students' ranked-order room preferences (1 above).

In June, students receive their building-type allocation (e.g. 'a triple in Unit 1' or 'a double in the African-American theme house') and decide whether to accept the offer, where the alternative is to choose to live in private-market housing. Note that students have not yet been assigned to specific rooms. 54 percent of freshmen accept their offer and proceed to the second stage of the lottery.

[40]The 1999 application remains available from the Internet Archive.

Figure FF-1: The 'Effect' of Undergraduate Affirmative Action on URM Male Students



Note: This figure shows an absence of notable changes in **URM** cohorts' long-run racial integration following Prop 209, though these figures combine treatment effect with selection bias arising from changes in the URM student composition absent affirmative action. The average URM share of 2023 residential blocks or local elementary schools of **URM** freshman male UC students or male state residents, and their share who were married to a URM spouse in 2023 (conditional on having a spouse), by UC starting year or (for residents) by birth year plus 18, as well as the share of **URM** male UC graduate medical, law, and business students who were married to a URM spouse in 2023 by cohorts before and after each respective school's cessation of race-based affirmative action. The vertical line denotes the cessation of affirmative action at UC. An individual's elementary high school is the closest public elementary school to the student's Census block centroid, excluding charter, magnet, and virtual schools. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Included medical schools (and years of affirmative action cessation, measured by largest 1994-1998 annual URM enrollment decline) are Davis (1994), Irvine (1995), and San Francisco (1997); law schools are Berkeley (1997), Davis (1995), and Irvine (1994); business schools are Berkeley (1997) and Davis (1996). Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and the California Department of Education.

Table GG-1: Housing Lottery Preference Points for Mismatch with Other Roommates

Rule	'95	'96	'97	'98	'99-'01	'02-'07
Open Room	1	1	1	1	1	1
Quiet Floor	3	3	3	3	3	3
Transfer	-	-	3	3	-	-
Late to Sleep	-	4	4	4	4	4
Early to Rise	-	-	-	-	4	4
Room Use	-	5	5	5	5	5
Not Fresh.	0	0	5	5	5	1k
Quiet Room	6	6	6	6	6	6
Smoker	5k	1	0	5k	5k	5k
Single-Sex	25k	25k	25k	25k	25k	25k

Note: The points assigned to each room for each student in the Berkeley housing lottery by year in which the lottery was conducted. '**Open Room**' indicates that no students have previously been assigned to that room. '**Quiet Floor**' indicates that the student prefers a quiet room but the room is not on a designated quiet floor. '**Transfer**' indicates that only one of the student or at least one student already placed in the room reported a 'Transfer' preference (which is observed in the data, but it is unclear what such a preference entails). '**Late to Sleep**' (and '**Early to Rise**') indicates that the student's preference to stay up late (or wake up early) does not match that of at least one student already placed in the room. '**Room Use**' indicates that the student's ternary room use preference does not match that of at least one student already placed in the room. '**Not Fresh.**' indicates that the student's freshman status does not match that of at least one student already placed in the room. '**Quiet Room**' indicates that the student's quiet room preference does not match that of at least one student already placed in the room. '**Smoker**' indicates that only one of the student or at least one student already placed in the room reported that they smoke. '**Single-Sex**' indicates mismatch between whether a student prefers living on a single-sex floor and whether the room is on a single-sex floor, with no regard for whether the student prefers a coed floor or is indifferent (which is reported). Preference points are directly observed for 2007 and inferred for previous years, in some cases with support from the provided change log. Source: Berkeley Housing Database and authors' inferences.

In the lottery's second stage, which occurred in August prior to the fall semester, first-year students are rerandomized and assigned rooms within their specified building-type.[41] Priority is given first to students who request single-sex floors and then (within single-sex preference) to students who jointly requested each other as roommates.[42] For each student in turn, points are assigned to each available room in the building-type based on the points shown in Table GG-1.[43] The points depend on the present student's preferences, the preferences of students already assigned to the room (including continuing students assigned prior to the lottery), and assigned characteristics of the floor. For example, in 2002, rooms that have no students in them gain 1 point; rooms where the student's preference over staying up late does not match an already-assigned student's preference gain 4 points; rooms where only one of the student or the already-assigned students smoke gain 5,000 points, et cetera. Students are assigned to the first room with the minimum number of points across all available rooms (so long as there isn't already an opposite-sex student assigned to the room), using a predetermined ordering of rooms. Table A-6 provides summary statistics for

[41] Nearly all lottery participants are freshmen; 5 percent are community college transfers who are also assigned dormitory rooms and are excluded from our baseline analysis.

[42] A small number of students register for the lottery late and are assigned whatever rooms remain.

[43] The 2007 points are observed. Earlier years' points are inferred from the data.

students' reported housing preferences.

Following the second-stage lottery, students are informed of their room and roommate assignments. Students are permitted to request room changes at that point or at any point during the year, some of which result in reassignments.

We replicate the second stage of the housing lottery in order to restrict our attention to students who select into Berkeley-owned housing, and thus hold students' building-type assignments fixed. We make a number of restrictions to isolate students whose roommate risk is estimable:

- We drop students who do not participate in the second-stage lottery (including most upperclassmen); students with disabilities (who are hand-placed into designated rooms); and student athletes (who are placed into adjoining suites outside the lottery).
- We drop students who jointly request roommates whose rooms are assigned outside the lottery, since those students are always placed in fixed rooms.

We take the set of rooms to which students in the lottery are assigned – which are observable separately from the rooms in which students ultimately reside – to be the complete set of rooms that students in the second-stage lottery were actually assigned.[44] We define single-sex hallways or suites by specific gender as those in which over 90 percent of residents are of that gender in that year, along with Bowles (men) and Stern (women), and indicate quiet floors as those in which over 95 percent of residents prefer quiet rooms in that year.[45] Despite careful allocation by gender to minimize the likelihood of mismatch, in a small number of cases running the lottery results in an impossible allocation of rooms by gender (e.g. there is only one remaining student in the lottery, and the student is male while the remaining room has a female already assigned); in these cases we assume the existence of a spare room where the remaining student can reside. In all other respects, we exactly replicate the Berkeley housing lottery, at least as it was conducted in 2007.

In our baseline housing analysis, we estimate $\hat{p}^{URM}$ by running the housing lottery separately by year (1995-2017) 1,000 times – setting the seed to integer values 1-1,000 – and measuring the share of roommate assignments in which the student has at least one URM roommate.

Appendix H: The Effect of Dormitory Floor Composition

In addition to the effect of being assigned a URM roommate, students' long-run racial integration could also be affected by living with a larger share of URM students on their freshman dormitory floor or in their suite, both of which are often generative of collegiate friendships. show that the

[44] In fact, there may have been spare rooms that students could have been assigned under different lottery draws. We do not observe a dataset that would include those spare rooms.

[45] The lottery code includes a balancing function that maintains near gender-parity on all coed floors; we omit this function from our recoding of the lottery for efficiency.

(Rosenbaum and Rubin, 1983) propensity score finding extends to continuous treatments conditional on the conditional density of the treatment. We operationalize this finding by extending Equation 4

Table HH-1: UC Berkeley Freshman **Floor**mates and Racial Integration

	Assigned URM RM (UF_i^A) (%)			Log Mean Zip AGI	SAT Score	Actual URM RM (%)	URM Share in Res. Block (%)			URM Spouse (%)	
URM	4.4	2.8	-0.3								
	(0.5)	(0.4)	(0.2)								
UF_{it}				-0.179	-45.0	58.893	4.7	0.6	0.5	-3.4	-5.2
				(0.096)	(21.3)	(1.030)	(2.8)	(3.5)	(2.0)	(5.0)	(6.9)
$\widehat{p_{UF}}$		88.1									
		(2.0)									
Year FE	X	X	X	X	X	X	X	X	X	X	X
$\widehat{p_{UF}}$ Centile FE			X	X	X	X		X	X		X
2023 County FEs									X		
Model		OLS		2SLS		OLS		2SLS		2SLS	
Separate Estimates Before and After 1998											
× AA	2.4	-0.3	-0.5	-0.169	-25.0	55.526	3.6	0.8	-0.7	-1.4	-0.9
	(0.7)	(0.5)	(0.4)	(0.089)	(19.2)	(1.984)	(3.1)	(3.3)	(3.2)	(4.0)	(4.5)
× After AA	5.5	0.3	-0.1	-0.068	-27.3	60.884	2.9	0.1	1.2	-2.9	-4.4
	(0.7)	(0.3)	(0.3)	(0.069)	(16.0)	(1.041)	(2.3)	(2.5)	(2.4)	(4.9)	(5.7)
Mean of Y		14.4		10.95	1386	13.6		19.3		6.6	
St. Dev. of Y		12.1		0.51	119	8.9		16.5		24.9	
Number of Obs.	13,785	13,785	13,727	11,574	11,852	12,099	8,907	8,886	8,886	4,756	4,743

Note: The relationship among 1995-2007 UC Berkeley freshmen of being URM and the share of residents on your assigned dormitory floor or in your suite who are URM (UF_i^A); the relationship between the URM share of your assigned floor or suite and the actual URM share of your floor or suite for non-URM students; and the estimated effect on non-URM students (following Equation 4) of the URM share of your floor or suite on the log average household income of residents in the student's pre-college residential Zip code and the student's 1600-scale SAT score (both balance tests), the average URM share of their 2023 residential block, or whether they are married to a URM spouse in 2023. Models are unconditional or conditional on the students' mean estimated URM share of their floor or suite in the housing lottery ($\widehat{p_{UF}}$ – which depends on their and others' room and roommate preferences and other lottery characteristics; see Appendix G – either using a linear term or centile fixed effects. Separate estimates in the years with (1995-1997) and without (1998-2007) affirmative action are jointly-estimated OLS reduced-forms (that is, direct estimates of outcome on being assigned a URM roommate). All but the first three columns are restricted to non-URM students; models controlling for $\widehat{p_{UF}}$ omit students where $\widehat{p_U} \in \{0, 1\}$; and models using voter data (residential block and spouse) restrict to male students. 2004-2005 students are omitted due to lottery inconsistencies. URM includes Black, Hispanic, and Native American students; spouses' races are predicted by L2.

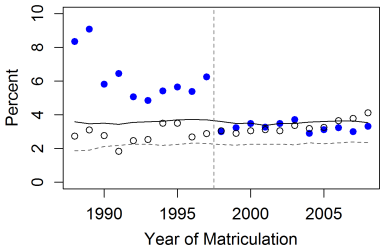
Source: Berkeley Housing, UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and IRS SOI.

Other Appendix Figures and Tables

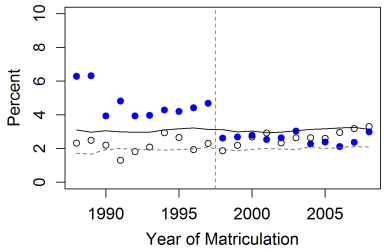
Figure A-1: The Effect of Affirmative Action on Enrollment by Ethnicity and Gender

Panel A: Black Students

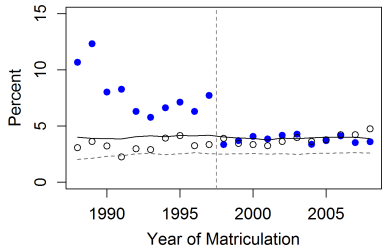
(a) All



(b) Male

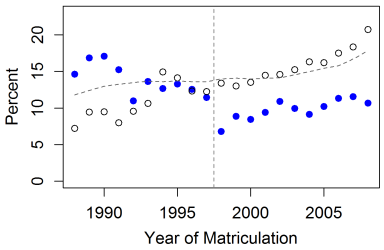


(c) Female

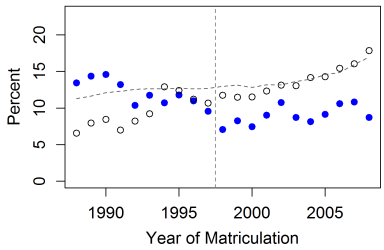


Panel B: Hispanic Students

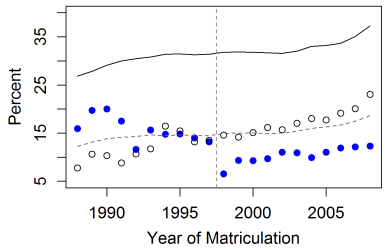
(d) All

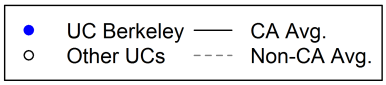


(e) Male



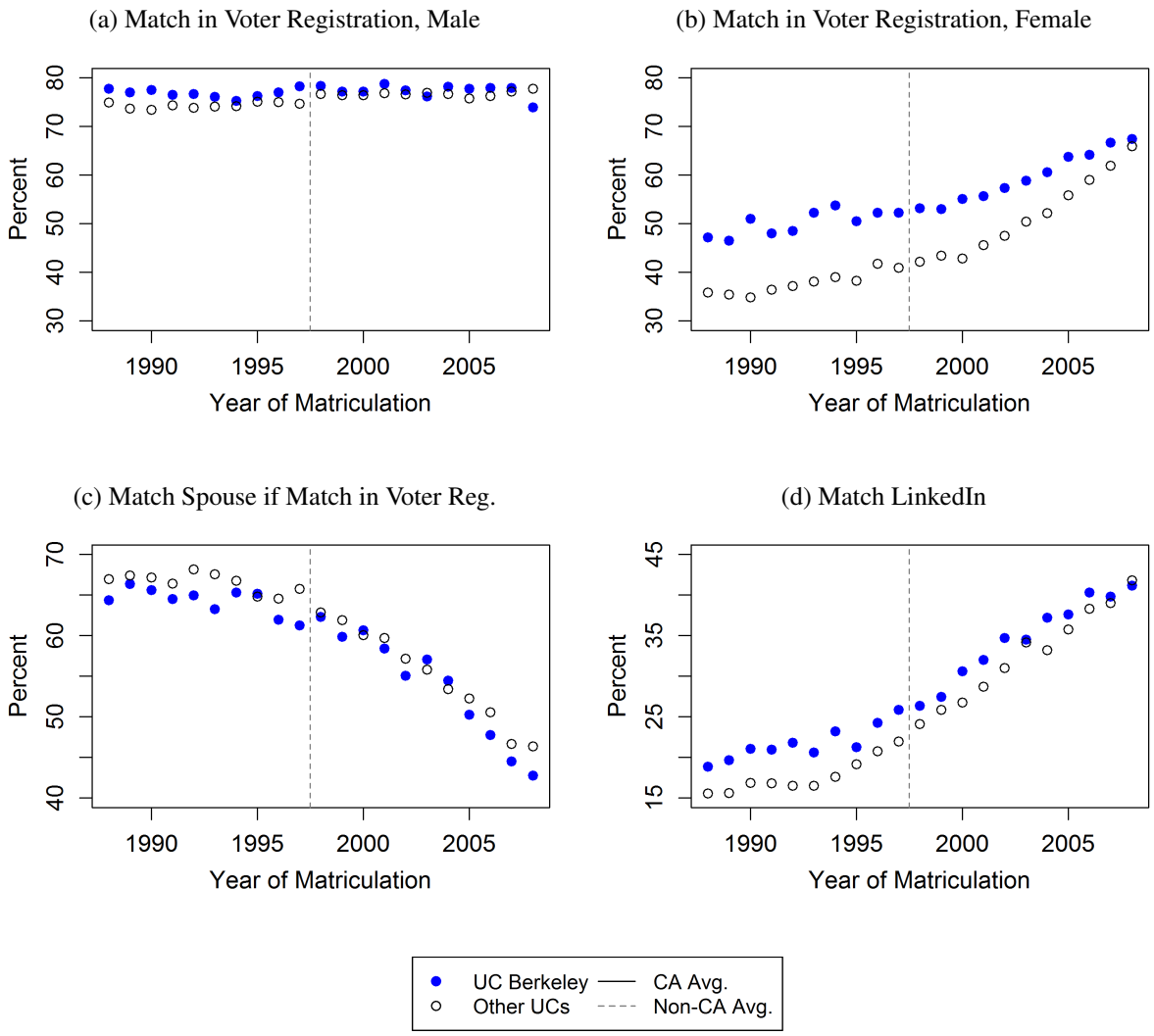
(f) Female





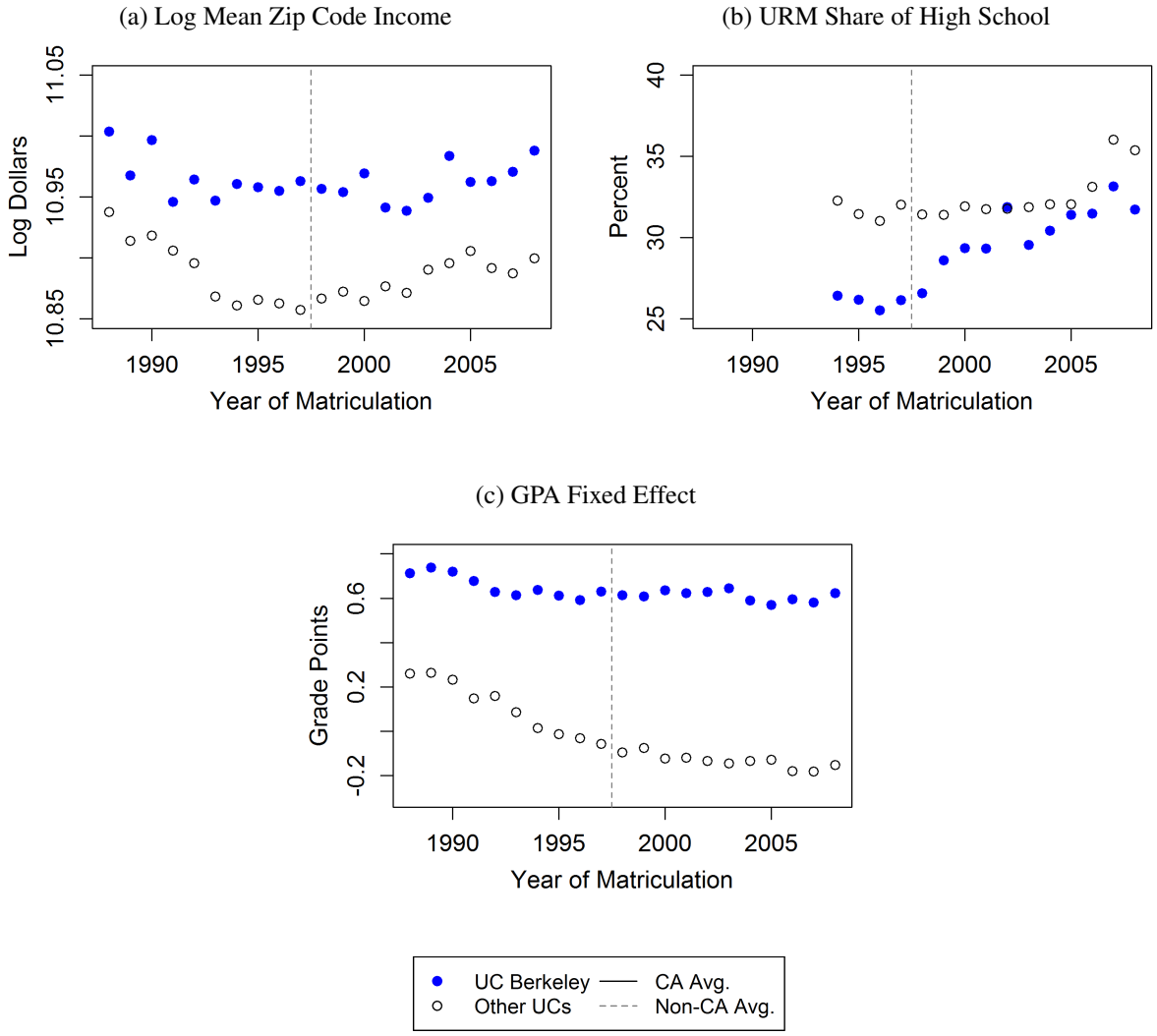
Note: The average Black and Hispanic share of freshman UC students or state residents overall and by gender, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

Figure A-2: Match Rates in Longitudinal Data



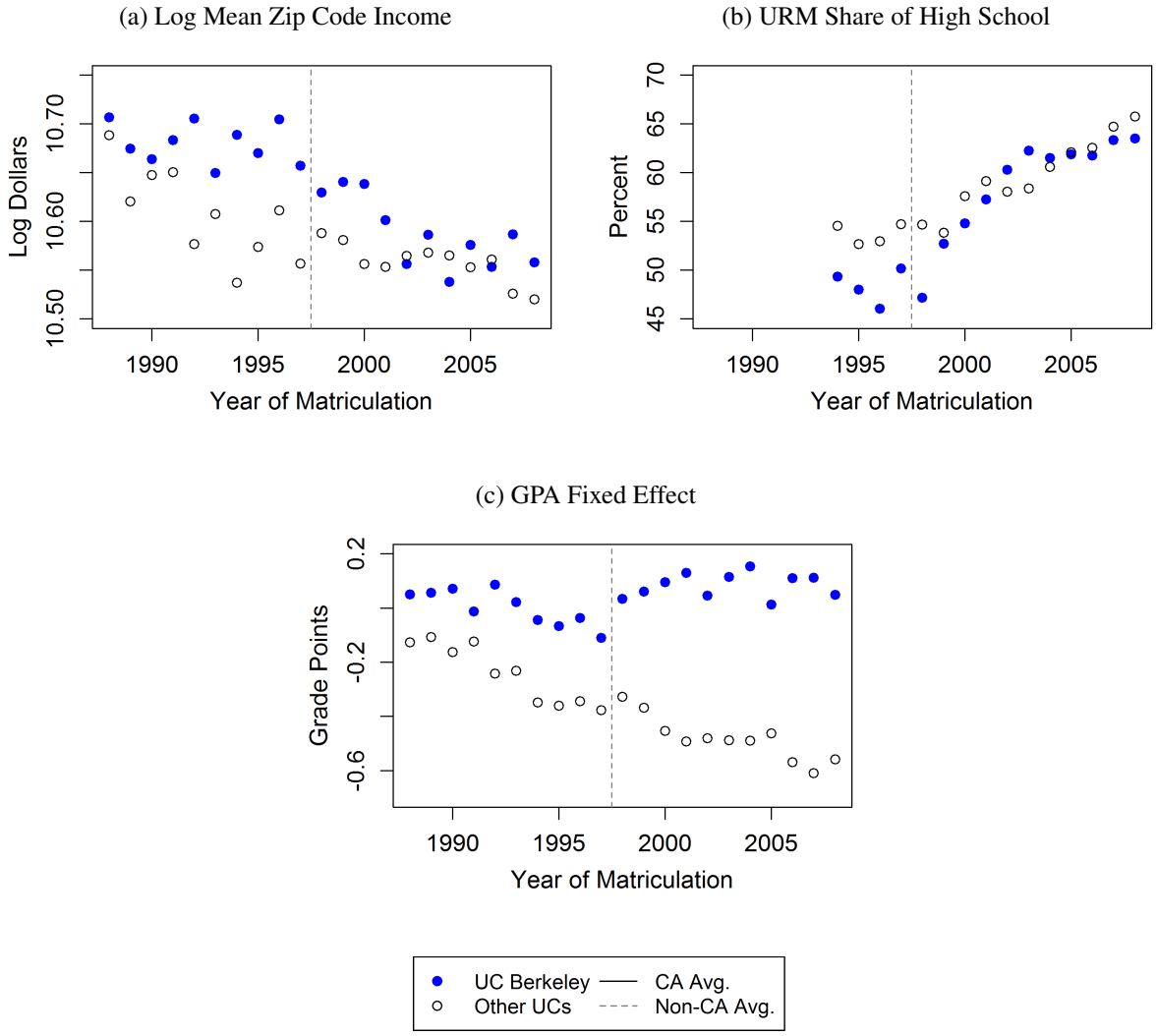
Note: The average match rate to the voter registration database, spousal match rate conditional on matching to (or being in) the voter registration database, and the average match rate to the LinkedIn database among non-URM freshman male (or female in (b)) UC students or (in (c)) male state residents, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. The spousal match rate is the share who coreside with exactly one other registered voter within 15 years of their age. See Appendix A for details on matching. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and LinkedIn.

Figure A-3: Non-URM Student Balance



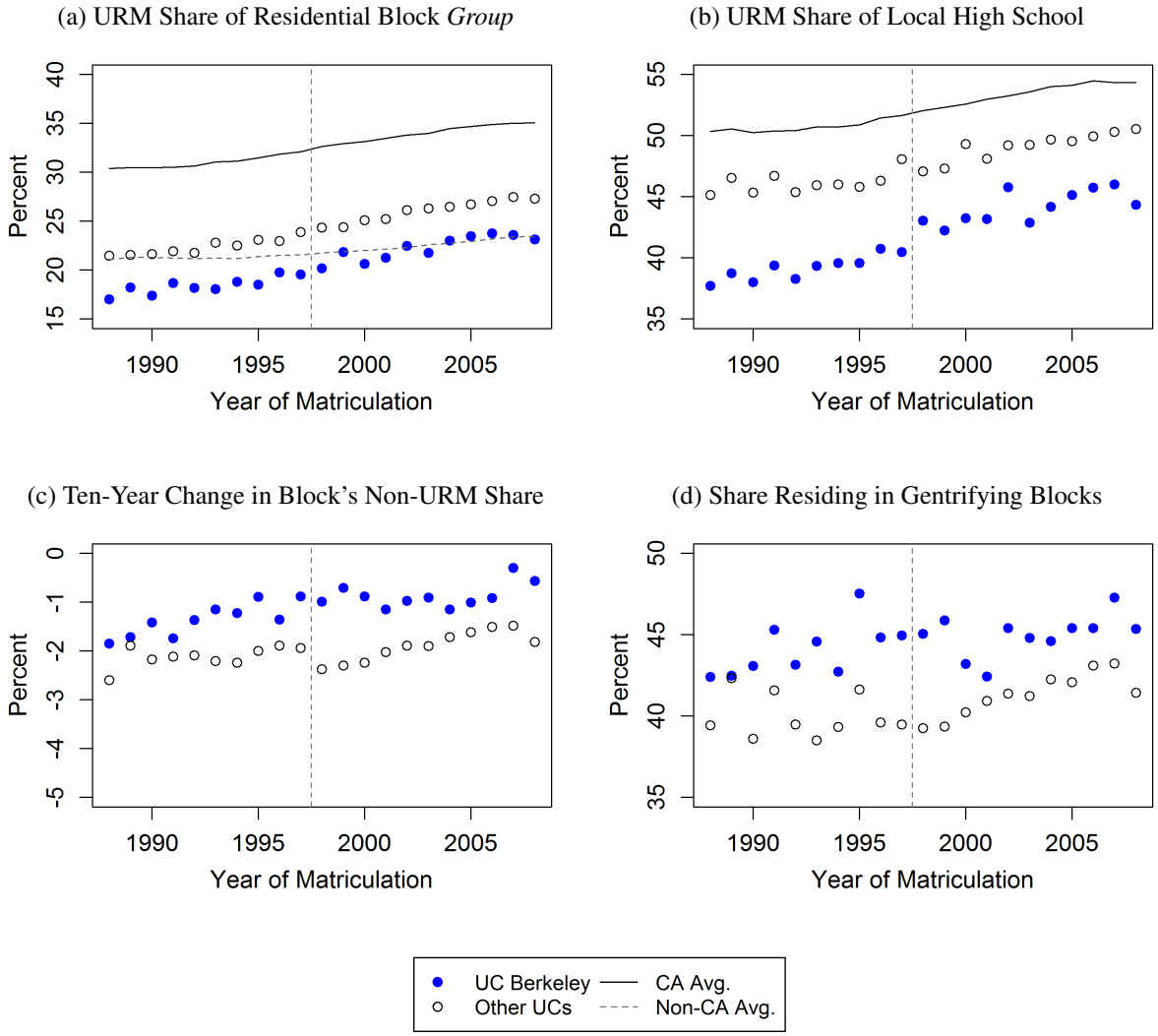
Note: The average residential Zip code family income, URM share of high school, and UC GPA fixed effect of non-URM freshman male UC students by UC starting year. The vertical line denotes the cessation of affirmative action at UC. The UC GPA fixed effect is the student fixed effect from a two-way fixed effect regression of grades on individual and class fixed effects; see Appendix B for details on estimation and consistency. URM includes Black, Hispanic, and Native American students. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, IRS SOI, and the California Department of Education

Figure A-4: URM Student Balance



Note: The average residential Zip code family income, URM share of high school, and UC GPA fixed effect of **URM** freshman male UC students by UC starting year. The vertical line denotes the cessation of affirmative action at UC. The UC GPA fixed effect is the student fixed effect from a two-way fixed effect regression of grades on individual and class fixed effects; see Appendix B for details on estimation and consistency. URM includes Black, Hispanic, and Native American students. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, IRS SOI, and the California Department of Education

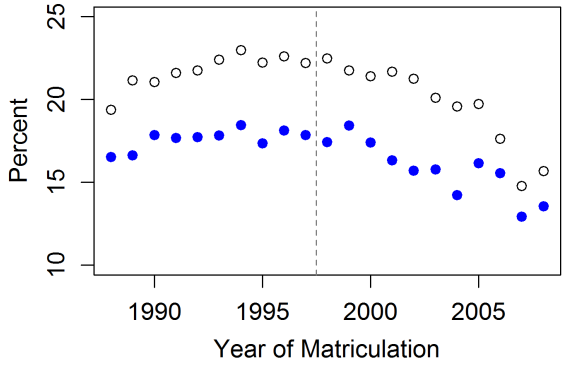
Figure A-5: The Effect of Affirmative Action on Other Residential Integration Outcomes



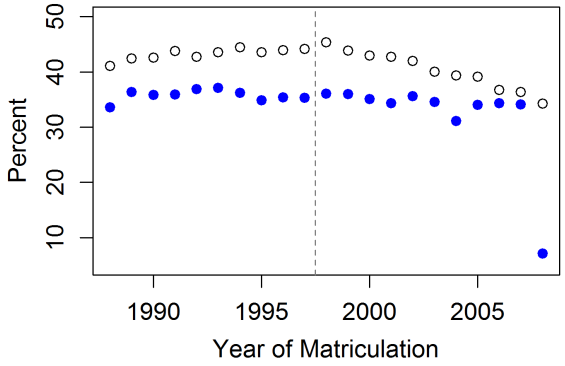
Note: The average URM share of 2023 residential block **group** or local high school of non-URM freshman male UC students or male state residents, the average ten-year change in those blocks' non-URM share, and the share living in blocks where that ten-year change is positive, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. The URM share change is defined as the difference between the address's 2020 block's 2020 URM share and its 2010 block's 2010 URM share. An individual's local high school is the closest public high school to the student's Census block centroid, excluding charter, magnet, and virtual schools. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and the California Department of Education.

Figure A-6: The Effect of Undergraduate Affirmative Action on Residential Integration Measured in 2006

(a) URM Share of Residential Block

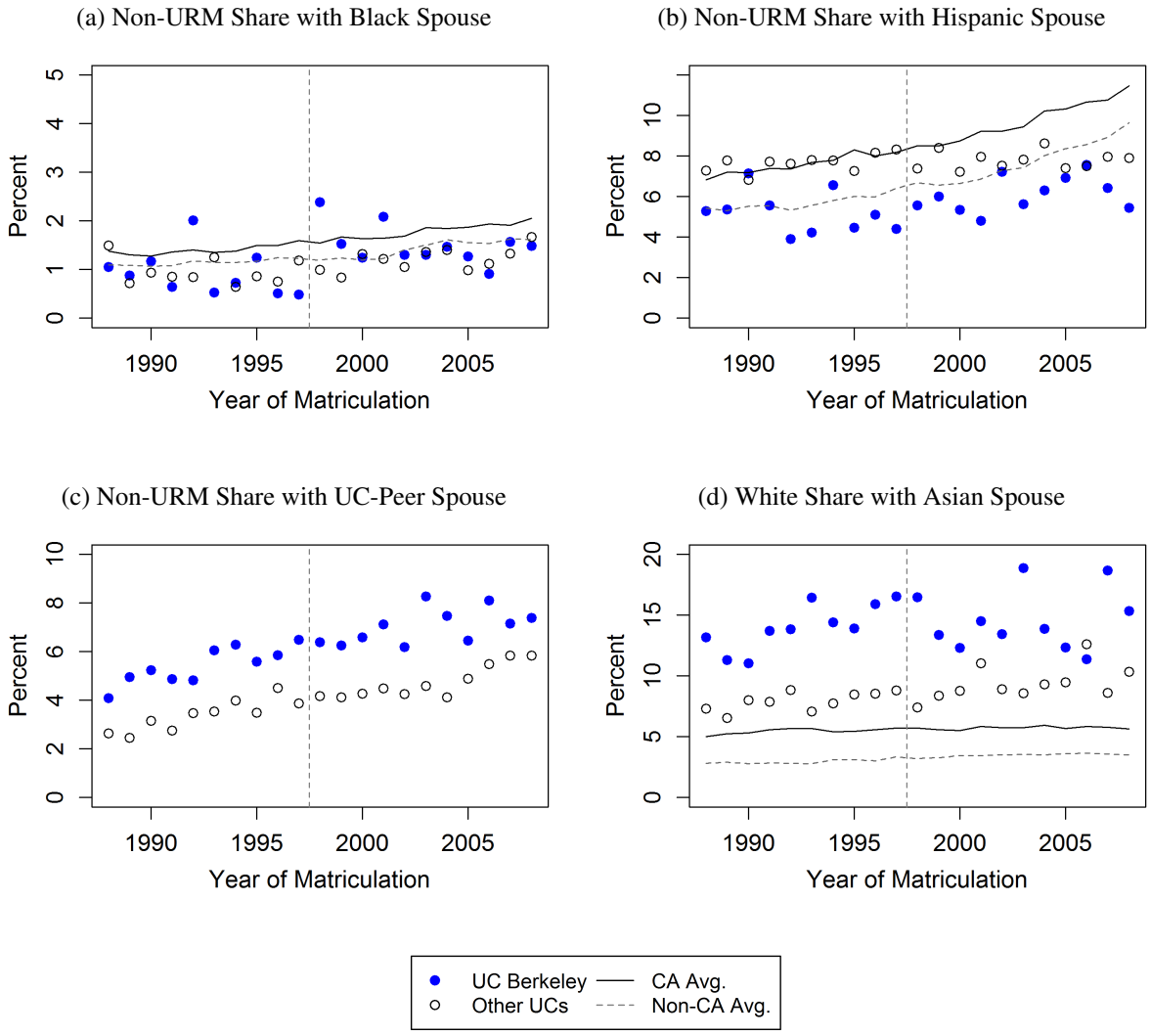


(b) URM Share of Local Elementary School



Note: The average URM share of **2006** residential block (measured by linking to the California voter registration database) or local elementary school of non-URM freshman male UC students or male state residents, by UC starting year. The vertical line denotes the cessation of affirmative action at UC. An individual's local elementary school is the closest public elementary school to the student's Census block centroid, excluding charter, magnet, and virtual schools. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018), the California Secretary of State, the US Census, and the California Department of Education.

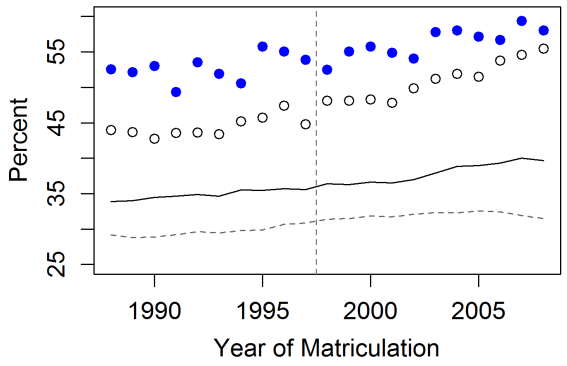
Figure A-7: The Effect of Affirmative Action on Other Marriage Outcomes



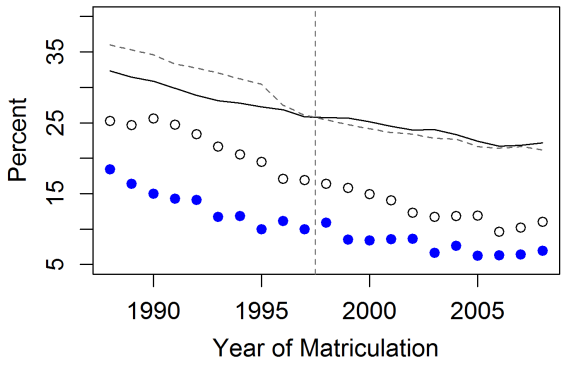
Note: The share of non-URM freshman male UC students or male state residents who were married to a Black, Hispanic, or UC-educated spouse in 2023 or the share of white freshman male UC students or male state residents who were married to an Asian spouse, conditional on having a spouse, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. UC peers include anyone who matched as having enrolled at the same UC campus as an undergraduate. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

Figure A-8: The Effect of Affirmative Action on Political Party

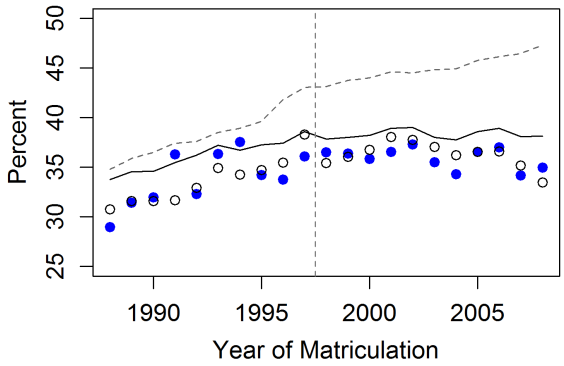
(a) Democrat

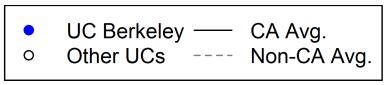


(b) Republican



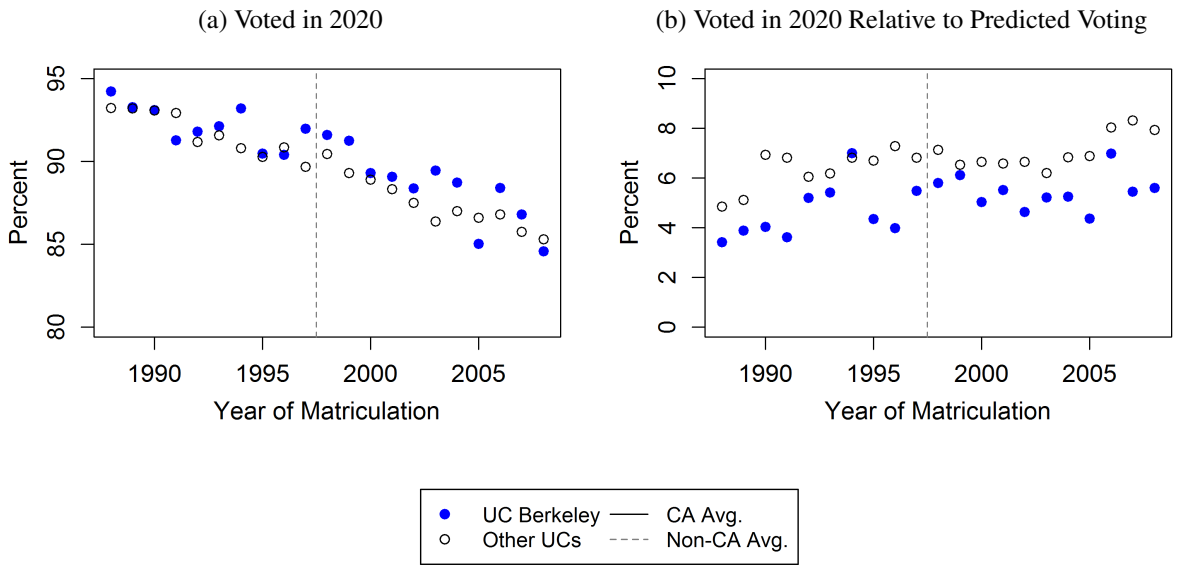
(c) Independent





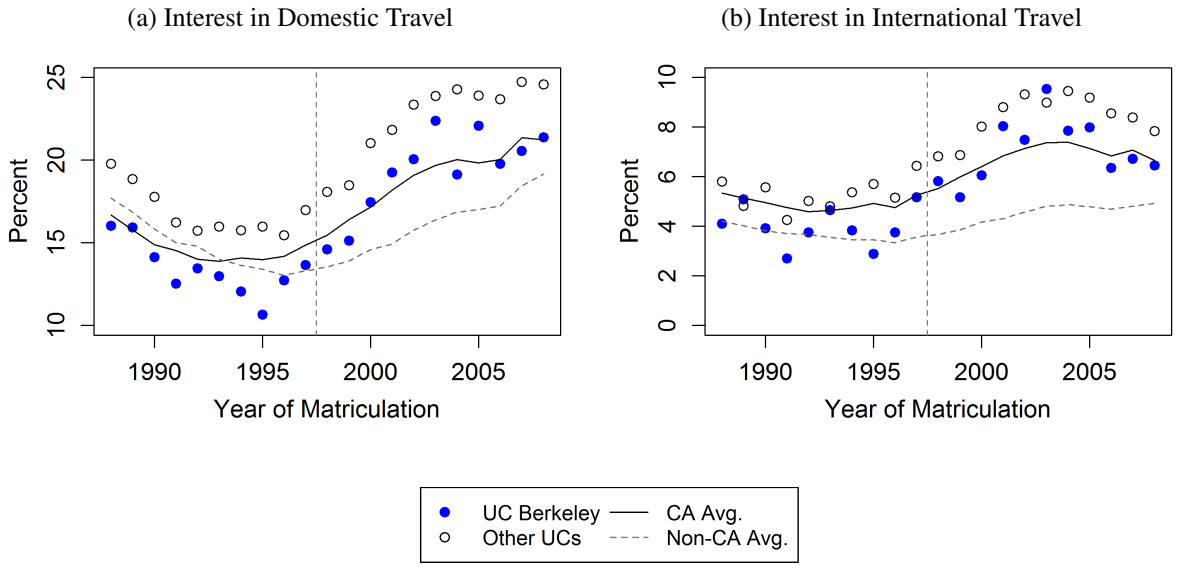
Note: The share of non-URM freshman male UC students or male state residents who were registered Democrats, Republicans, or independents (defined as being neither a Democrat or a Republican), by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

Figure A-9: The Effect of Affirmative Action on Voting in November 2020



Note: The share of non-URM freshman male UC students or male state residents who voted in the 2020 general election or the residual of a linear regression predicting 2020 general election voter participation by participation and participation type (in-person or by mail) in prior elections over the previous 4 years, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. The 2020 general election in California included a vote on Proposition 16, which would have permitted the resumption of race-based affirmative action at UC. See Appendix A for details on residual definition. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

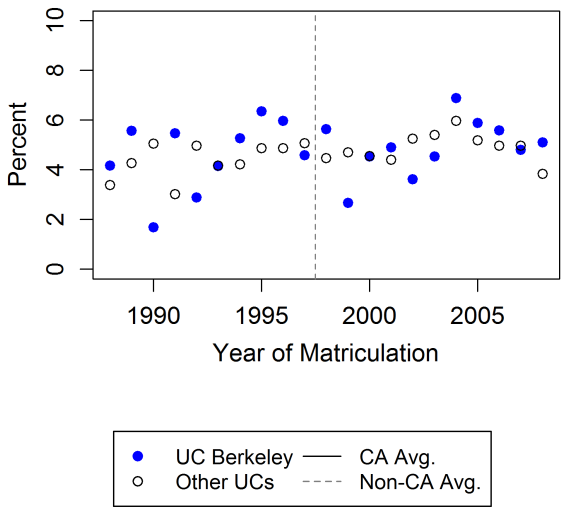
Figure A-10: The Effect of Affirmative Action on Predicted Travel Interest



Note: The share of non-URM freshman male UC students or male state residents who are predicted by L2 to have an interest in domestic or international travel, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. L2 predicts domestic and international travel interest using proprietary corporate data including magazine subscriptions. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

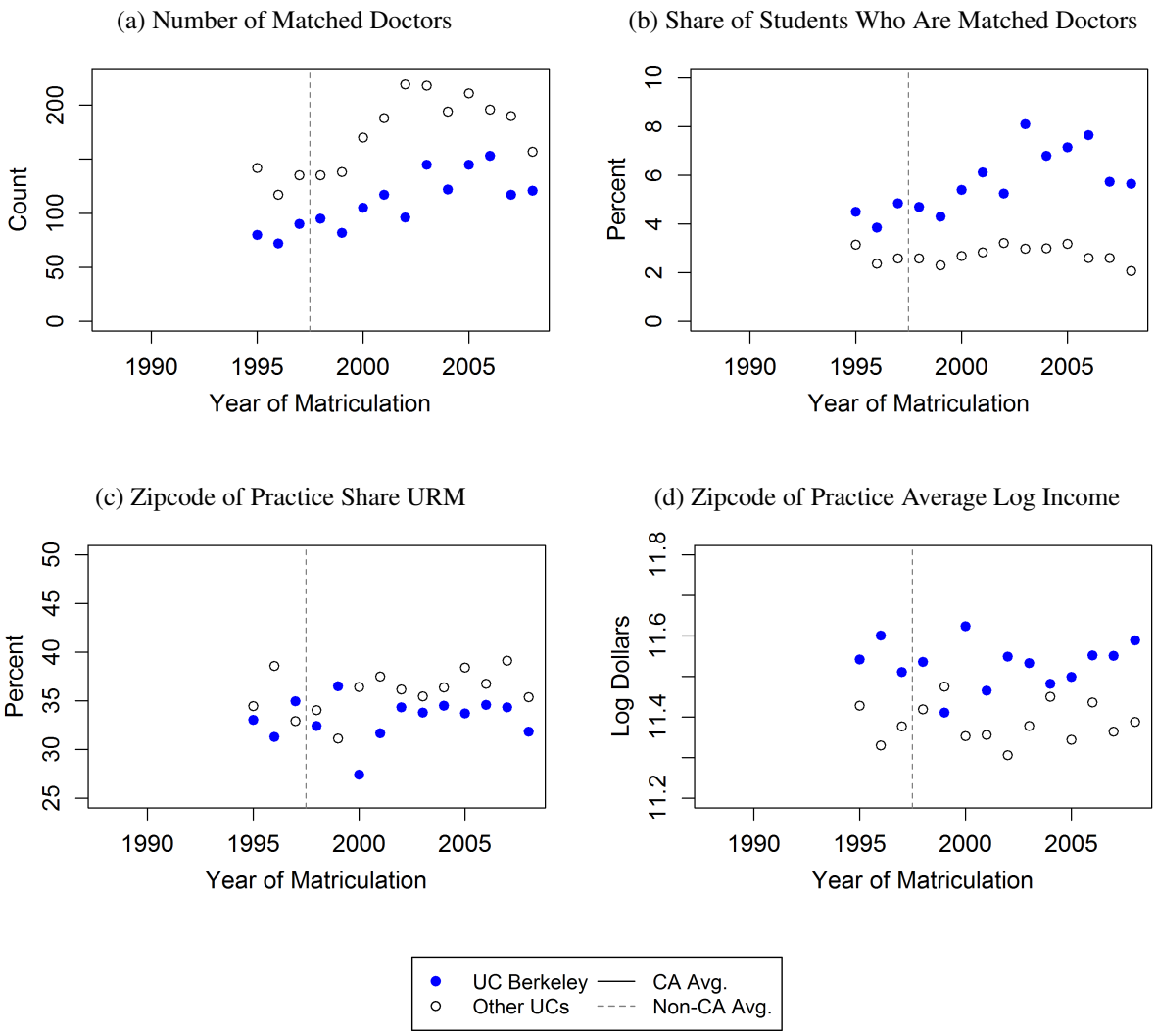
Figure A-11: The Effect of Affirmative Action on Public Service Employment

(a) Public Service



Note: The share of non-URM freshman male UC students who were employed at a public-service-oriented firm at any point between 2015 and 2019 among those fuzzy matched to LinkedIn profiles by name, university, and enrollment years. See data appendix for firm categorization details. The vertical line denotes the cessation of affirmative action at UC. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and LinkedIn.

Figure A-12: The Effect of Undergraduate Affirmative Action on Doctor Outcomes

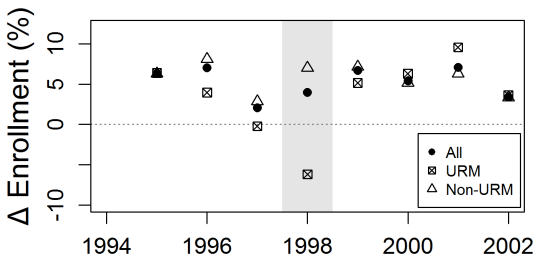


XXX. Source: UC-CHP Student Database (Bleemer, 2018), the National Student Clearinghouse, the Medical Board of California, Doximity, US Census, and IRS SOI.

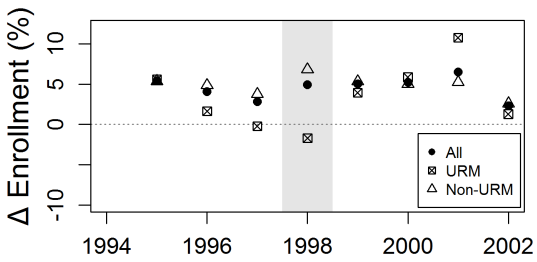
Figure A-13: Annual Changes in Undergraduate Enrollment at California Institutions

Panel A: Annual Change in Freshman Fall Undergraduate Enrollment

(a) Public California Universities



(b) California Universities

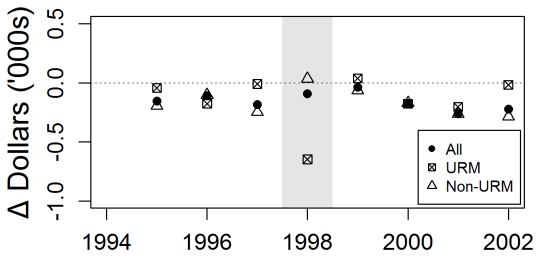


Panel B: Annual Change in Undergraduate Enrollment "CFSTY" Value-Added

(c) Public California Universities

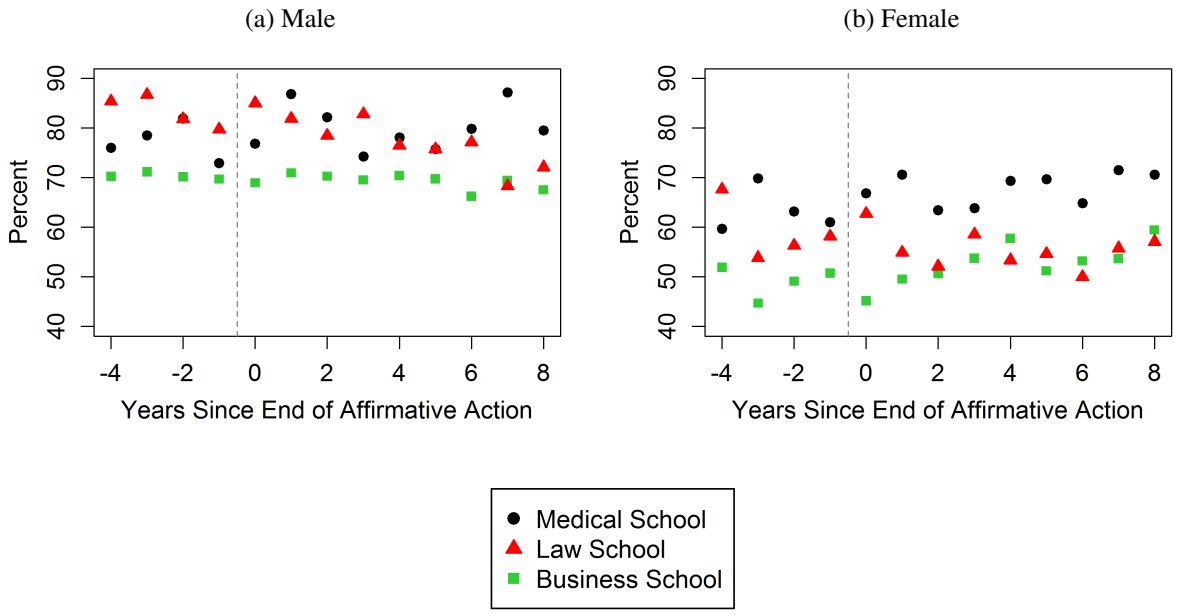


(d) California Universities



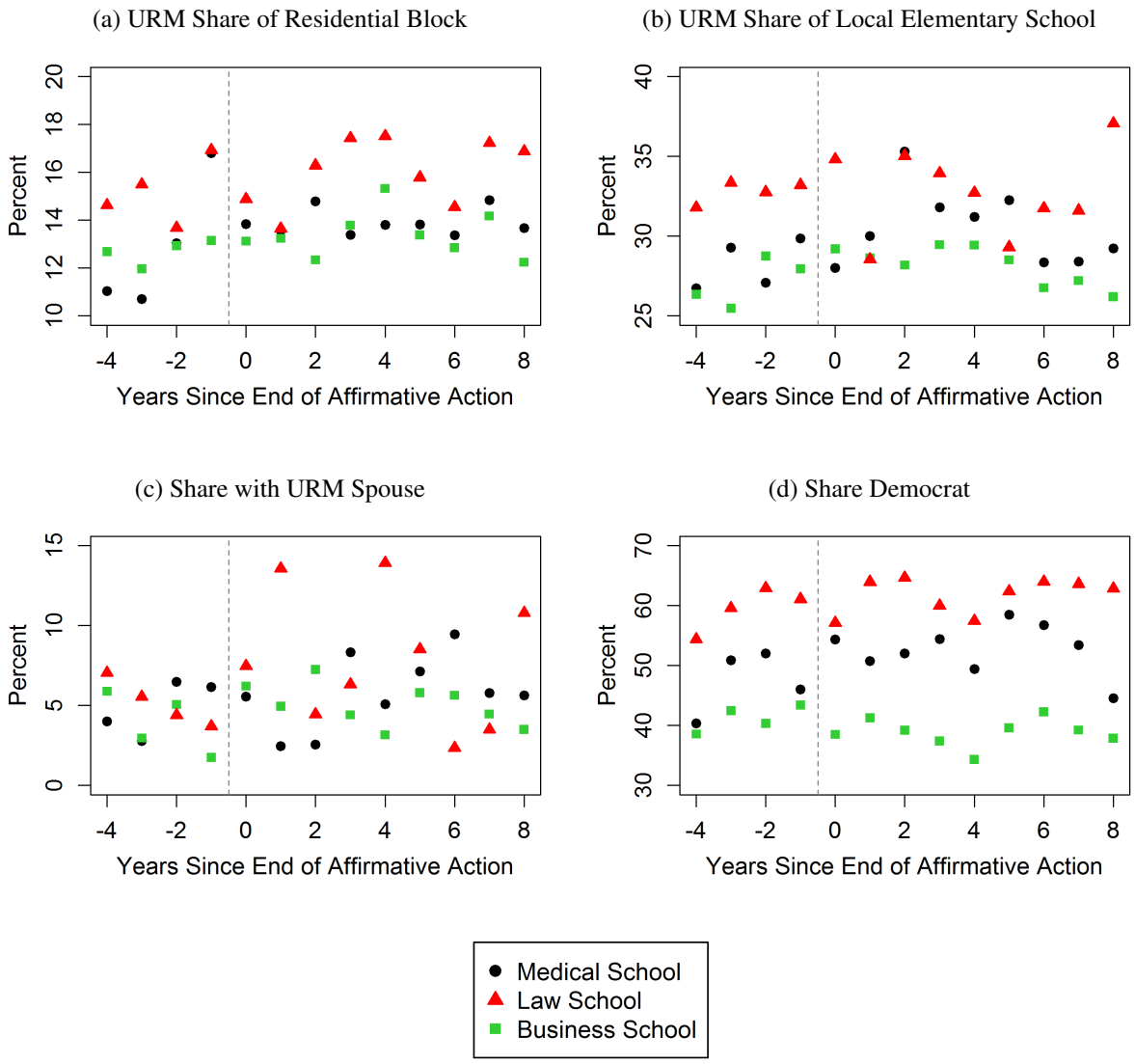
Note: This figure shows that while Prop 209 may have slightly depressed the growth of California public universities in 1997 and 1998, it had no measurable net effect on either the growth of all California institutions or the relative number of students enrolled at higher- or lower-value-added California institutions, with sharp declines in the value-added of URM students' enrollment institutions compensated for by increases among non-URM students in 1998. Year-over-year changes in freshman fall undergraduate enrollment and the enrollment-weighted average value-added of public and all California universities, overall and for URM and non-URM freshman students. Universities include all four-year institutions in California. See Appendix I of Bleemer (2022) for methodological details and the estimated "CFSTY" value-added statistics; value-added measured relative to CSU Long Beach. This figure replicates Figure A-2 in Bleemer (2022). Source: The Integrated Postsecondary Education Data System, UC Corporate Student System, and the CA Employment Development Department.

Figure A-14: Graduate Student Match Rates in Longitudinal Data



Note: The average URM share of male and female first-year UC students in graduate medical (MD), law (JD), or business (MBA) programs, by UC starting year or (for residents) by birth year plus 18. The vertical line denotes the cessation of affirmative action at UC. URM includes Black, Hispanic, and Native American students; non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Source: UC-CHP Student Database (Bleemer, 2018) and the L2 Voter Database.

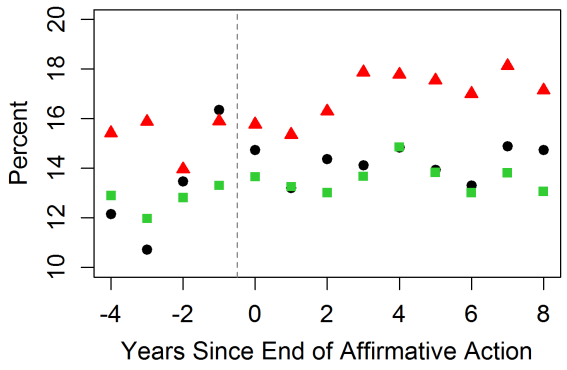
Figure A-15: The Effect of Affirmative Action on Other Graduate School Racial Integration Outcomes



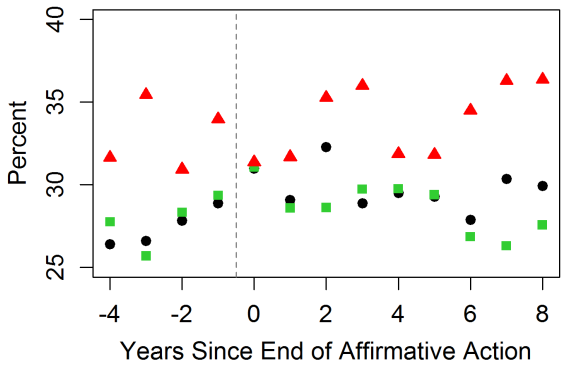
Note: XXX. Source: UC-CHP Student Database (Bleemer, 2018), Medical Board of California, and Doximity.

Figure A-16: The Effect of Affirmative Action on Other Graduate School Racial Integration Outcomes, **Men and Women**

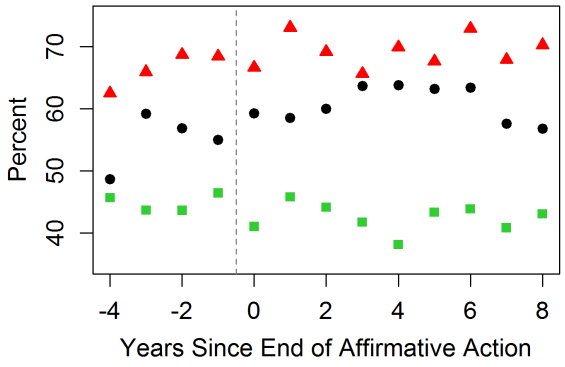
(a) URM Share of Residential Block



(b) URM Share of Local Elementary School



(c) Share Democrat



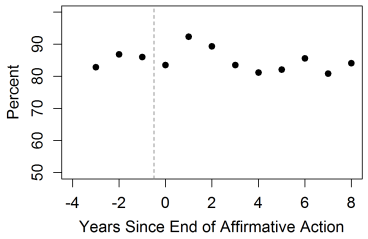


Note: XXX. Source: UC-CHP Student Database (Bleemer, 2018), Medical Board of California, and Doximity.

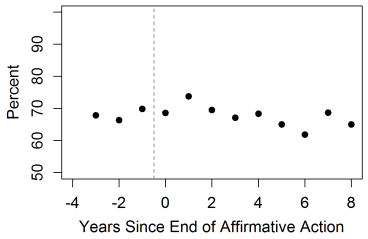
Figure A-17: Medical Student Match Rates in Longitudinal Data

Panel A: Male Students

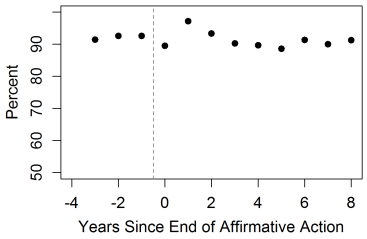
(a) Match to Doximity



(b) Match to CA Board of Med

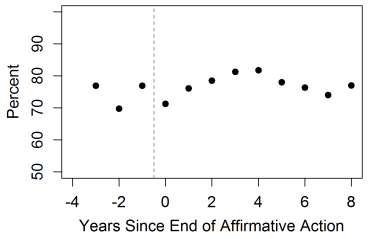


(c) Match to Either

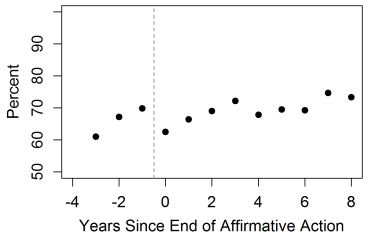


Panel B: Female Students

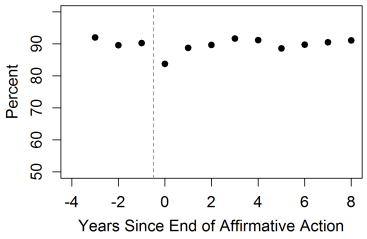
(d) Match to Doximity



(e) Match to CA Board of Med

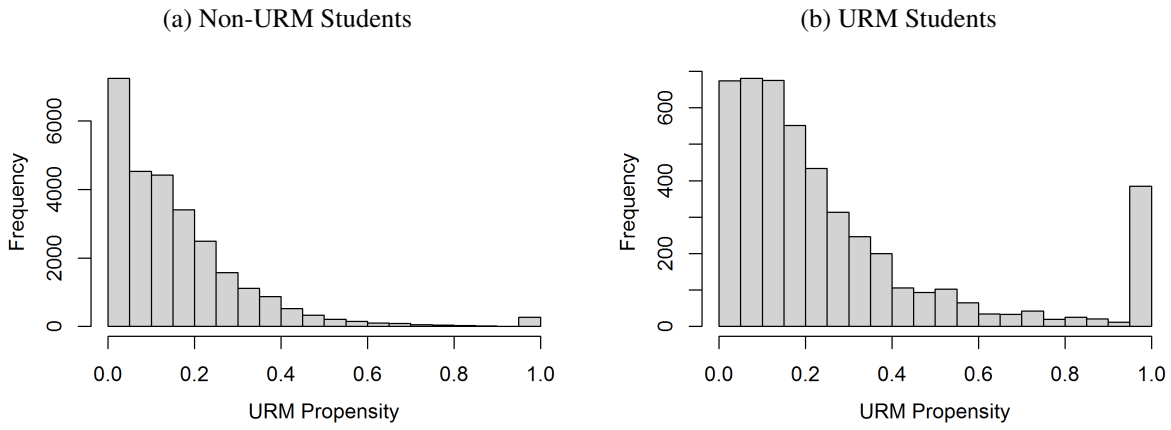


(f) Match to Either



Note: XXX. Source: UC-CHP Student Database (Bleemer, 2018), Medical Board of California, and Doximity.

Figure A-18: Distribution of URM Freshman Roommate Risk



Note: The distribution of non-URM and URM students' simulated likelihood of being assigned to a freshman dormitory room with a URM roommate, conditional on that simulated likelihood being neither 0 nor 1. See Appendix G for details on lottery simulation. URM includes Black, Hispanic, and Native American students. Source: Berkeley Housing and the UC-CHP Student Database (Bleemer, 2018).

Table A-1: Observational Relationships with Integration Outcomes

Dep. Var:	Block URM Share (%)		URM Spouse (%)	
Sample:	Non-URM	URM	Non-URM	URM
High School % URM	0.12	0.25	0.06	0.36
	(0.01)	(0.02)	(0.02)	(0.06)
Zip Code Avg. Income	-4.63	-14.13	-1.34	-21.11
	(0.37)	(1.49)	(0.80)	(3.78)
UC Berkeley	-2.89	-0.51	-2.26	-1.66
	(0.37)	(1.23)	(0.78)	(3.12)
Mean of Y	20.5	38.0	7.9	57.0
R^2	0.064	0.193	0.006	0.128
Number of Obs.	10,282	1,992	6,069	1,131

Note: This table shows that student characteristics are strongly correlated in expected directions with residential integration and interracial marriage, confirming that the presented measures of racial integration provide strong and predictable signals of individual behaviors. Linear regressions of the URM share of 2023 residential blocks and a 0-100 indicator for being married to a URM spouse in 2023 on the share of the student's high school graduating class that was URM, the average family income of the student's Zip code in their year of high school graduation, and an indicator for the student's enrolling at UC Berkeley, across 1988-2008 linked University of California freshmen at the Berkeley, Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz campuses. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. Log mean AGI is measured in the student's pre-college home address's Zip code.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the CA Department of Education, IRS SOI, and the US Census.

Table A-2: Summary of Affirmative Action's Effects on Later-Life within-County Racial Integration

Specification:	Berkeley Only	Bkly vs. Other UC All	Bkly vs. Other UC High-AI	Bkly vs. Whole States CA	Bkly vs. Whole States Non-CA
Panel A: URM Share in Residential Block (%)					
UC Berkeley		-3.34	-5.04	-8.56	-6.21
		(0.48)	(0.72)	(0.49)	(0.78)
UC Berkeley ×	-0.42	0.75	1.06	-0.16	-0.42
Aff. Action	(0.73)	(0.56)	(0.85)	(0.56)	(0.52)
Cohort FE	T.T.	X	X	X	X
2023 County FE	X	X	X	X	X
Mean of Y	17.9	20.7	21.3	31.2	20.7
St. Dev. Of Y	15.9	17.3	17.5	22.8	18.7
Number of Obs.	5,708	20,372	16,160	391,864	365,389

Note: OLS regressions of the URM share of 2023 residential block on whether the person attended UC Berkeley and whether it was prior to 1998 (when the university ended race-based affirmative action), across various non-URM freshman male samples among 1995-1998 cohorts defined either by first year of enrollment or, for non-students, birth year plus 18, **including 2023 county fixed effects**. The first column shows single-difference estimates controlling for a cohort trend. The second and third columns show diff-in-diff estimates relative to other UC campuses, with cohort fixed effects and either overall or restricting Berkeley students to those with a Berkeley Academic Index of at least 7,500 (indicating that the students would be consistently near-guaranteed admission). The fourth and fifth columns show diff-in-diff estimates relative to residents of California or other states, omitting all other matched UC students from the resident sample. Regressions include a cohort trend (T.T.) or fixed effects (X). URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

Table A-3: Summary of Affirmative Action's Effects on Later-Life Racial Integration

Specification:	Berkeley Only	Bkly vs. Other UC All	Bkly vs. Other UC High-AI	Bkly vs. Whole States CA	Bkly vs. Whole States Non-CA
Panel A: URM Share in Residential Block (%)					
UC Berkeley		-3.87	-5.27	-12.56	-2.52
		(0.30)	(0.48)	(0.28)	(0.27)
UC Berkeley ×	0.69	-0.27	-0.54	0.10	0.69
1998-2000	(0.62)	(0.42)	(0.66)	(0.40)	(0.38)
UC Berkeley ×	1.11	-0.06	-0.51	0.39	1.49
2001-2003	(1.09)	(0.42)	(0.64)	(0.41)	(0.39)
Cohort FE	T.T.	X	X	X	X
Mean of Y	18.9	22.0	22.5	32.1	21.2
St. Dev. Of Y	16.4	17.9	18.1	23.0	18.9
Number of Obs.	12,810	52,318	43,515	921,892	854,191
Panel B: Share with URM Spouse (%)					
UC Berkeley		-3.47	-5.68	-3.72	-1.69
		(0.58)	(0.80)	(0.47)	(0.46)
UC Berkeley ×	3.04	2.12	3.57	0.42	0.64
1998-2000	(1.28)	(0.85)	(1.25)	(0.69)	(0.67)
UC Berkeley ×	4.18	1.91	2.20	-0.67	-0.51
2001-2003	(2.24)	(0.87)	(1.17)	(0.71)	(0.69)
Cohort FE	T.T.	X	X	X	X
Mean of Y	6.7	8.4	8.5	9.3	7.2
St. Dev. Of Y	25.0	27.7	28.0	29.1	25.8
Number of Obs.	7,020	28,858	24,039	511,362	425,417
Panel C: URM Share of Students' Class Peers (%)					
UC Berkeley		-0.15	-2.40		
		(0.08)	(0.12)		
UC Berkeley ×	-1.66	-3.59	-3.48		
1998-2000	(0.17)	(0.11)	(0.15)		
UC Berkeley ×	-0.51	-5.11	-4.68		
2001-2003	(0.29)	(0.11)	(0.15)		
Cohort FE	T.T.	X	X		
Mean of Y	12.8	15.2	15.5		
St. Dev. Of Y	5.1	5.5	5.5		
Number of Obs.	16,871	69,750	58,061		

Note: OLS regressions of the URM share of 2023 residential block or an indicator for being married to a URM spouse in 2023 on whether the person attended UC Berkeley and whether they were in the 1998-2000 or 2001-2003 incoming cohorts, across various non-URM freshman male samples among 1995-2003 cohorts defined either by first year of enrollment or, for non-students, birth year plus 18. See the notes to Table 2 for the research design presented in each column and variable definitions. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

Table A-4: Affirmative Action's Statewide Effects on Later-Life Racial Integration

Specification:	CA vs. Non-CA Men	CA vs. Non-CA Overall
Panel A: URM Share in Res. Block (%)		
California	10.49	10.37
	(0.09)	(0.06)
California ×	-0.56	-0.55
Aff. Action	(0.11)	(0.08)
Cohort FE	X	X
Mean of Y	26.1	26.1
St. Dev. of Y	21.5	21.6
Number of Obs.	773,383	1,589,514
Panel B: Share with URM Spouse (%)		
California	1.79	1.53
	(0.17)	(0.11)
California ×	0.16	0.17
Aff. Action	(0.19)	(0.13)
Cohort FE	X	X
Mean of Y	7.9	7.3
St. Dev. of Y	27.0	26.1
Number of Obs.	421,687	855,496

Note: Note: OLS difference-in-difference regressions of the URM share of 2023 residential block or an indicator for being married to a URM spouse in 2023 on whether the person resided in California and whether it was prior to 1998 (when the university ended race-based affirmative action), across male or all registered voters in California and neighboring states (Arizona, Nevada, Oregon, and Washington) among 1995-1998 cohorts defined by birth year plus 18. Regressions include cohort fixed effects. Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. URM includes Black, Hispanic, and Native American students; all genders and races are predicted by L2. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

Table A-5: Effects of Affirmative Action at Less-Selective Campuses on Later-Life Racial Integration

Specification:	UC Only	UC vs. Whole States CA	Non-CA
Panel A: URM Share in Residential Block (%)			
Other UC Campus		-8.18	-3.55
		(0.32)	(0.31)
Other UC Campus ×	-0.51	-0.32	-0.44
Aff. Action	(0.53)	(0.37)	(0.35)
Cohort FE	T.T.	X	X
Mean of Y	21.8	31.1	26.2
St. Dev. of Y	17.6	22.7	21.6
Number of Obs.	14,664	399,638	760,857
Panel B: Share with URM Spouse (%)			
Other UC Campus		-3.54	-2.51
		(0.52)	(0.50)
Other UC Campus ×	1.85	0.42	0.38
Aff. Action	(1.11)	(0.60)	(0.58)
Cohort FE	T.T.	X	X
Mean of Y	8.8	8.8	7.9
St. Dev. of Y	28.3	28.4	27.0
Number of Obs.	8,591	231,307	413,981

Note: OLS regressions of the URM share of 2023 residential block or an indicator for being married to a URM spouse in 2023 on whether the person attended a **non-Berkeley UC campus** and whether it was prior to 1998 (when the university ended race-based affirmative action), across various non-URM freshman male samples among 1995-1998 cohorts defined either by first year of enrollment or, for non-students, birth year plus 18. The first column shows single-difference estimates controlling for a cohort trend. The second and third columns show diff-in-diff estimates relative to residents of California or other states, omitting all other matched UC students from the resident sample. Regressions include a cohort trend (T.T.) or fixed effects (X). Spouses are defined as the only other individual within 15 years of age registered to vote at the same address; 89% are opposite-sex. URM includes Black, Hispanic, and Native American students; all spouses' and non-students' gender and race are predicted by L2. Other UC campuses include Davis, Irvine, Riverside, Santa Barbara, and Santa Cruz; non-CA states include Arizona, Nevada, Oregon, and Washington. Standard errors in parentheses are robust.

Source: UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, and the US Census.

Table A-6: Descriptive Statistics for UC Berkeley Housing Sample

	All Non-URM Freshmen	Has URM RM Risk	Male Students	Link to L2 Data	p-value for Col. 1 vs. 4
Female (%)	52.3	53.0			
Age	40.8	40.7	41.0	40.9	0.01
CA Resident (%)	90.1	89.5	87.8	90.5	0.22
SAT	1359	1358	1384	1384	0.00
GPA_FE	0.71	0.71	0.71	0.71	0.99
Share HS URM (%)	29.4	29.7	29.2	29.0	0.30
Mean AGI (log $)	10.94	10.94	10.95	10.96	0.01
Multiple Roommates (%)	36.3	39.0	36.0	35.8	0.24
Theme House (%)	13.3	12.7	11.3	11.2	0.00
Smoker (%)	2.4	2.2	2.2	2.2	0.36
URM Roommate (%)	16.2	17.8	15.8	15.2	0.04
Number of Obs.	25,659	20,978	9,856	7,204	

Note: Sociodemographic, academic, and residential characteristics of 1995-2007 UC Berkeley freshman students overall and with increasing sample restrictions: students with non-degenerate URM roommate risk (that is, students whose likelihood of URM roommate assignment by the housing lottery was strictly between 0 and 1 in simulations; see Appendix G), male students, and students who uniquely matched the L2 voter database by name and birth date. The last column tests equality in means between the unrestricted and fully-restricted sample. Age is measured in 2023. California residency is measured at freshman year. GPA fixed effects are the unshrunken fixed effects from an Abowd et al. (1999)-style decomposition of course GPAs into student and course-term fixed effects estimated *across* UC campuses and years; see Appendix A. Log mean AGI is measured in the student's pre-college home address's Zip code. Multiple roommates is the share of students assigned to triple or quadruple rooms in their freshman year; theme house is the share assigned to live in single-sex dormitories (Bowles or Stern) or others like the African American or Casa Magdalena theme houses. Smoker is the share who report smoking on their housing application; URM roommate is the share assigned to URM roommates.

Source: Berkeley Housing, UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and IRS SOI.

Table A-7: Annual Estimates of URM Roommate Homophily

	Uncondit. OLS		Conditional OLS		
Year	Intercept	URM	Intercept	URM	$\hat{p}^U$
1994	0.22	0.11	0.03	0.05	0.84
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
1995	0.21	0.08	0.03	0.01	0.86
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
1996	0.22	0.12	0.03	0.02	0.85
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
1997	0.20	0.14	0.01	0.04	0.91
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
1998	0.13	0.08	0.01	-0.04	0.97
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
1999	0.14	0.10	0.01	0.03	0.90
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2000	0.13	0.06	0.00	0.01	0.92
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2001	0.16	0.12	0.03	0.05	0.76
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2002	0.15	0.13	0.00	-0.02	0.94
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2003	0.16	0.07	0.01	-0.02	0.90
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2004	0.11	0.28	0.01	0.13	0.77
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2005	0.12	0.18	-0.01	0.07	0.89
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2006	0.15	0.12	-0.01	-0.01	1.04
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
2007	0.13	0.07	-0.02	0.01	0.99
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)

Note: Estimates from annual linear regressions over all freshman participants in Berkeley housing that year of whether they were assigned a URM roommate on whether they themselves were URM, either unconditional or conditional on students' lottery-determined likelihood of being assigned a URM roommate ($\hat{p}^U$). URM includes Black, Hispanic, and Native American students.

Source: Berkeley Housing and the UC-CHP Student Database (Bleemer, 2018).

Table A-8: UC Berkeley Freshman Roommates and **Other** Outcomes

	Log Mean Zip AGI		SAT Score		URM Share in Elem. Sch. (%)		Reg. Party (%) Dem.	Rep.	Indep.	Student Survey Politics	Δ Tolerance
U_{it}	-0.020	0.007	-9.8	3.6	2.5	1.2	-3.3	-1.3	4.5	0.01	-0.08
	(0.009)	(0.011)	(2.3)	(2.7)	(0.9)	(1.1)	(1.9)	(1.0)	(1.9)	(0.08)	(0.05)
Year FE	X	X	X	X	X	X	X	X			
$\widehat{p_U}$ Centile FE		X		X	X	X	X	X	X	X	X
Separate Estimates Before and After 1998											
× AA	-0.030	-0.009	-11.6	-2.5	2.9	1.3	0.1	-4.9	4.8		
	(0.016)	(0.018)	(3.6)	(4.0)	(1.5)	(1.7)	(3.0)	(1.6)	(2.9)		
× After AA	-0.014	0.014	-8.3	6.0	2.1	1.1	-4.6	0.6	4.1	0.01	-0.08
	(0.011)	(0.012)	(2.7)	(3.1)	(1.1)	(1.2)	(2.2)	(1.2)	(2.1)	(0.08)	(0.05)
Mean of Y	10.9		1359		36.6		55.94	7.75	36.31	3.11	0.53
St. Dev. of Y	0.5		128		25.7		49.65	26.74	48.09	1.32	0.99
Number of Obs.	24,426	20,086	24,988	20,597	7,603	6,125	7,353	7,353	7,353	2,723	4,139

Note: The estimated effect (following Equation 4) of 1995-2007 non-URM UC Berkeley freshmen having a URM roommate (U_i^A) on the log average household income of residents in the student's pre-college residential Zip code and the student's 1600-scale SAT score (both balance tests), the average URM share of the nearest public elementary school to their 2023 residence, their registered political party (defining 'Independent' as anything other than 'Democrat' or 'Republican'), or their earliest response to biannual 2006-2012 student surveys (among respondents): a 1-7 Likert scale of students' political orientation (where 1 is 'very liberal') and the difference between two 1-6 Likert scales of 'current proficiency' and 'started UC proficiency' on 'ability to appreciate, tolerate and understand racial and ethnic diversity'. Models are unconditional or conditional on centile fixed effects of the students' estimated propensity of being assigned a URM roommate in the housing lottery ($\widehat{p_U}$), which depends on room and roommate preferences and other lottery characteristics; see Appendix G. Separate estimates in the years with (1995-1997) and without (1998-2007) affirmative action are jointly-estimated OLS reduced-forms (that is, direct estimates of outcome on being assigned a URM roommate). Models controlling for $\widehat{p_U}$ omit students where $\widehat{p_U} \in \{0, 1\}$; models using voter data (elementary school diversity and party registration) restrict to male students. 2004-2005 students are omitted due to lottery inconsistencies. URM includes Black, Hispanic, and Native American students.

Source: Berkeley Housing, UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, IRS SOI, and SERU.

Table A-9: UC Berkeley Freshman Roommates and Racial Integration **for URM Students**

	Log Mean Zip AGI		SAT Score		Actual URM RM (%)	URM Share in Res. Block (%)			URM Share in Elem. Sch. (%)		URM Spouse (%)	
U_{it}	-0.100	-0.046	-53.1	-18.5	90.196	8.3	10.4	6.5	7.5	10.2	14.4	16.7
	(0.017)	(0.025)	(5.8)	(8.4)	(1.148)	(2.0)	(2.9)	(2.5)	(2.2)	(3.3)	(4.9)	(8.2)
Year FE	X	X	X	X	X	X	X	X	X	X	X	X
$\widehat{p_U}$ Centile FE		X		X	X		X	X		X		X
2023 County FEs								X				
Model	2SLS		2SLS		OLS	2SLS			2SLS		2SLS	
Separate Estimates Before and After 1998												
$\times$ AA	-0.082	-0.014	-48.3	-11.9	88.301	8.3	10.9	8.2	5.8	8.6	5.8	5.1
	(0.025)	(0.032)	(8.1)	(10.4)	(1.658)	(2.8)	(3.6)	(3.6)	(3.3)	(4.2)	(6.8)	(9.6)
$\times$ After AA	-0.102	-0.063	-50.9	-20.5	91.709	7.1	7.6	4.9	7.7	9.0	19.9	24.3
	(0.021)	(0.029)	(7.3)	(9.9)	(1.377)	(2.4)	(3.6)	(3.6)	(2.6)	(3.9)	(6.0)	(9.3)
Mean of Y	10.6		1159		27.77		37.0		53.6		50.8	
St. Dev. of Y	0.4		160		44.79		27.4		29.3		50.0	
Number of Obs.	4,056	3,306	4,119	3,372	3,448	1,279	1,038	1,038	1,114	906	659	529

Note: The relationship between male students being assigned to a URM freshman roommate by the UC Berkeley housing lottery (U_i^A) under the university's affirmative action regime (AA: 1995-1997) or after Proposition 209 (1998-2007) and whether the student is URM, the log average household income of residents in the student's pre-college residential Zip code, the student's SAT score, whether they actually live with a URM peer in their freshman year, the average URM share of their 2023 residential block, or whether they are married to a URM spouse in 2023. Models are unconditional or conditional on the students' estimated propensity of being assigned a URM roommate in the housing lottery ($\widehat{p_U}$) – which depends on room and roommate preferences and other lottery characteristics; see Appendix G – either using a linear term or centile fixed effects. All but the first three columns are restricted to non-URM students; models controlling for $\widehat{p_U}$ omit students where $\widehat{p_U} \in \{0, 1\}$. 2004-2005 students are omitted due to lottery inconsistencies. URM includes Black, Hispanic, and Native American students; spouses' races are predicted by L2.

Source: Berkeley Housing, UC-CHP Student Database (Bleemer, 2018), the L2 Voter Database, the US Census, and IRS SOI.

Table A-10: Year that Graduate Schools Ended Affirmative Action

University:	Medical	Law	Business
UC Berkeley	-	1997	1997
UC Davis	1994	1996	1995
UC Irvine	1995	-	1994
UC Riverside	-	-	-
UC Santa Barbara	-	-	-
UC Santa Cruz	-	-	-
UC San Francisco	1998	-	-

Note: This table shows that graduate programs varied in when they ended their affirmative action programs – as measured by sharp abrupt declines in URM enrollment – between 1994 (the year prior to SP-1) to 1998 (when Prop 209 became binding for undergraduate programs). The year of the largest year-over-year decline in URM enrollment between 1988 and 2008 in each professional medical (M.D.), law (J.D.), and business (M.B.A.) school degree program at the covered University of California campuses, used as event years in Figure 6. Prop 209 prohibited consideration of race in admissions starting in 1997. Schools that opened after 1998 (like UC Irvine Law and UC Riverside Medicine) are omitted. URM includes Black, Hispanic, and Native American students.

Source: UC-CHP Student Database (Bleemer, 2018).