# Academic Undermatching of High-Achieving Minority Students: Evidence from Race-Neutral and Holistic Admissions Policies[†]

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Investing in postsecondary education is an effective route from poverty and a key path to economic prosperity. However, there are substantial disparities in college enrollment across socioeconomic status and racial groups in the United States. Only 51 and 67 percent of high school graduates from low- and middle-income families, respectively, compared to 82 percent from upper-income families enrolled in college the fall semester after graduation; and 62 percent of black and 60 percent of Hispanic graduates enrolled in college the fall semester after graduation, compared to 71 percent of white graduates (US Department of Education 2010).

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Recent research has focused on the worrisome phenomenon of *undermatch*, where highly qualified students do not apply to high ranking universities, despite affirmative action in admissions and the availability of generous financial aid (Griffith and Rothstein 2009; Smith, Pender, and Howell 2013; Dillon and Smith 2013; and Hoxby and Avery 2013). It is unclear why high-performing low-income and minority students would not apply to prestigious universities. Do these students lack information about college quality and admissions processes? Face higher costs due to distance? Or simply have a different preference for "elite" colleges than higher-income students? Deconstructing potential causes of undermatch is difficult because institutions vary in admissions strategies, levels of diversity, and location.

This study builds on our existing work focusing more generally on the application decisions of low-income and minority students (Black, Cortes, and Lincove 2015). We take advantage of the distinct institutional features of Texas's higher education system to examine the phenomenon of undermatch in a relatively controlled setting. We analyze the application choices of highly qualified minority students who graduate in the top 25 percent of their high school class. These students undergo two distinct admissions policies: *guaranteed admissions* (top 10 percent students) and *holistic admissions* (top 11–25 percent students). Texas is one of the few states in the nation that practices both "percent plan" and holistic admissions policies. In 1997, the Texas legislature passed House Bill 588—known as the Top 10 Percent Plan. Specifically, students from the top 10 percent of their senior class at *all* Texas public high schools are eligible for automatic admissions to *all* Texas' public universities of their choice—including the highly selective flagship campuses of the University of Texas at Austin and Texas A&M University. Academic slots not filled by

automatically admitted students are given to students who undergo a more traditional holistic admissions process that includes race as one of many background factors. Thus, comparing the application choices of top 10 percent graduates, who face guaranteed admissions, against top 11–25 percent graduates who face holistic admissions, is a particularly useful analysis of undermatching as a student driven phenomenon versus a function of admissions processes. Top 10 percent students are all informed during their junior year of high school of their guaranteed admissions status and provided with information about campus options, while, students below the top 10 percent face the uncertainty and costs of a typical college search and application process.

Relative to the existing research on undermatching, our analysis here has several advantages over previous studies. First, the direct and indirect costs of information and attendance are minimized by focusing on in-state institutions. Second, Texas uses a common application for state universities, thus, the marginal cost of applying is minimal. Finally, and most importantly, unlike previous studies that assume they can accurately predict student's probability of admission to selective universities by matching students on academic achievement, our analysis exploits the fact that the highest performing graduates are entitled to automatic admissions to all Texas' public universities.[1] This means, for top 10 percent students, uncertainty regarding admissions to elite universities is completely eliminated, and therefore, top 10 percent students who do not apply to selective universities are undermatched.

Using student-level data from two recent graduating high school cohorts, we find that, despite guaranteed admissions, there is undermatching in the application behavior of black and Hispanic top 10 percent graduates; these students are less likely to apply to a top-tier flagship university compared to their white student counterparts. Our results also suggest an even larger problem of academic undermatching among top 11–25 percent Hispanic students. These students are less likely to compete for admission for flagship universities even if their coursework and high school performance exceed the average for typical admittance. Moreover, in additional analysis (see Black, Cortes, and Lincove 2015), we find no evidence that institutional undermatching by minorities at state universities is offset by enrollment at private or out-of-state colleges, but instead, both top 10 percent and top 11–25 percent minority graduates are more likely to enroll at less competitive Texas four-year universities or two-year colleges compared to white students.[2]

## I. Data Sources

The data for this study were collected by the Texas Workforce Data Quality Initiative funded by the US Department of Labor. Data coverage includes all students who graduated from Texas public high schools in 2008 and 2009. To estimate undermatch, we restrict our analytical sample to students who graduated in the top 25 percent of their senior class during these two years, and who applied to any Texas selective four-year public university directly after high school.[3] This includes about 35,000 top 10 percent and 31,000 top 11–25 percent students from approximately 500,000 total graduates. These students could apply to an elite flagship campus simply by checking an additional box on the unified state college application known as *ApplyTexas*. We define undermatch as not applying to a top-tier flagship university. High school measures of college readiness and eligibility for automatic admissions were obtained from high school academic records and college applications. Demographics, family background, and family income were obtained from high school enrollment records, college applications, and financial aid forms. Enrollment at private or out-of-state universities was obtained from the National Student Clearinghouse (NSC).

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[1] Undermatching studies use either standardized tests (SAT or ACT scores) or standardized tests with honors-weighted high school GPA and coursework completed in Advanced Placement (AP) or International Baccalaureate (IB), and student-college matches are made by predicting the probability of admission to selective universities based on these academic achievements (see, for example, Smith, Pender, and Howell 2013).

[2] In related work (Black, Cortes, and Lincove 2015), we further examine the influence of high school quality on the application decision.

[3] There are 22 selective four-year public universities in Texas; list available from the authors upon request.

Table 1—College Application and Enrollment Choices for Top 10 Percent and Top 11–25 Percent Students

|  | All | Black | Hispanic | Asian | White |
|---|---|---|---|---|---|
| *Panel A. Guaranteed admissions, top 10 percent students* | | | | | |
| Applied to top-tier flagships | 0.630 | 0.469 | 0.508 | 0.789 | 0.681 |
|  | (0.483) | (0.499) | (0.500) | (0.408) | (0.466) |
| *College enrollment* | | | | | |
| Enrolled at a top-tier flagship | 0.425 | 0.288 | 0.316 | 0.511 | 0.481 |
|  | (0.494) | (0.453) | (0.465) | (0.500) | (0.500) |
| Enrolled at another Texas four-year (selective) | 0.291 | 0.338 | 0.393 | 0.226 | 0.247 |
|  | (0.454) | (0.473) | (0.488) | (0.419) | (0.431) |
| Enrolled at open enrollment Texas four-year | 0.043 | 0.124 | 0.030 | 0.014 | 0.045 |
|  | (0.203) | (0.330) | (0.172) | (0.119) | (0.207) |
| Enrolled at Texas private four-year | 0.077 | 0.080 | 0.075 | 0.077 | 0.078 |
|  | (0.266) | (0.271) | (0.263) | (0.266) | (0.268) |
| Enrolled out-of-state at four-year | 0.057 | 0.065 | 0.036 | 0.088 | 0.060 |
|  | (0.232) | (0.247) | (0.186) | (0.283) | (0.238) |
| Enrolled at two-year college | 0.052 | 0.043 | 0.091 | 0.023 | 0.039 |
|  | (0.223) | (0.203) | (0.288) | (0.151) | (0.194) |
| Did not enroll | 0.055 | 0.062 | 0.059 | 0.060 | 0.050 |
|  | (0.227) | (0.241) | (0.235) | (0.238) | (0.219) |
| Observations | 35,187 | 2,415 | 9,691 | 3,746 | 19,227 |
| *Panel B. Holistic admissions, top 11–25 percent students* | | | | | |
| Applied to top-tier flagships | 0.263 | 0.139 | 0.168 | 0.471 | 0.329 |
|  | (0.440) | (0.345) | (0.374) | (0.499) | (0.470) |
| *College enrollment* | | | | | |
| Enrolled at a top-tier flagship | 0.124 | 0.050 | 0.052 | 0.197 | 0.178 |
|  | (0.330) | (0.218) | (0.222) | (0.398) | (0.383) |
| Enrolled at another Texas four-year (selective) | 0.517 | 0.516 | 0.564 | 0.569 | 0.483 |
|  | (0.500) | (0.500) | (0.496) | (0.495) | (0.500) |
| Enrolled at open enrollment Texas four-year | 0.087 | 0.187 | 0.056 | 0.042 | 0.089 |
|  | (0.281) | (0.390) | (0.231) | (0.201) | (0.285) |
| Enrolled at Texas private four-year | 0.048 | 0.044 | 0.047 | 0.044 | 0.051 |
|  | (0.215) | (0.205) | (0.212) | (0.205) | (0.219) |
| Enrolled out-of-state at four-year | 0.029 | 0.040 | 0.014 | 0.026 | 0.036 |
|  | (0.167) | (0.197) | (0.119) | (0.159) | (0.185) |
| Enrolled at two-year college | 0.133 | 0.085 | 0.187 | 0.087 | 0.113 |
|  | (0.340) | (0.280) | (0.390) | (0.282) | (0.317) |
| Did not enroll | 0.062 | 0.078 | 0.080 | 0.035 | 0.050 |
|  | (0.241) | (0.268) | (0.271) | (0.185) | (0.218) |
| Observations | 31,713 | 3,314 | 10,294 | 1,502 | 16,513 |

*Note:* Standard deviations are in parenthesis.

*Sources:* Authors' calculations from Texas Workforce Data Quality Initiative Database and National Student Clearinghouse, 2008 and 2009 student cohorts.

## II. Empirical Findings and Discussion

Table 1 presents the summary statistics for the application and enrollment choices of top 10 percent and top 11–25 percent college applicants overall and by race and ethnicity. Among top 10 percent applicants (panel A) who are automatically admitted to highly selective flagship universities, 63 percent actually applied to flagships, and 43 percent ultimately enrolled. There is initial evidence of academic undermatching among top 10 percent black and Hispanic students, with

only 47 and 51 percent, respectively, applying to flagship campuses despite a guarantee of admissions, compared to 68 percent of white and 79 percent of Asian students. Moreover, only 29 percent of black and 32 percent of Hispanic students in the top 10 percent ultimately enrolled at a flagship university.

Students who are also high-performing but not automatically admitted are represented in the top 11–25 percent of graduates (panel B). These students, who must undergo a highly competitive, holistic admissions process, are much less likely to apply to a top-tier flagship university. Twenty-six percent of all top 11–25 percent graduates applied to a flagship university, but only 12 percent ultimately enrolled. Despite the fact that Texas allows for race and diversity goals to contribute to admissions decisions, the undermatch for racial and ethnic minorities is greater among the top 11–25 percent than top 10 percent students. Only 14 percent of black and 17 percent of Hispanic students in this group applied to flagship universities, compared to 33 percent of white and 47 percent of Asian students. The holistic admissions process does little to attract diversity, as only 5 percent of black and Hispanic students in this group ultimately enroll at flagship campuses.

Furthermore, as shown in Table 1, there is no evidence that the observed undermatch by highly qualified minorities at state universities is offset by enrollment at private or out-of-state colleges. In fact, both black and Hispanic top 10 percent and top 11–25 percent students are more likely to enroll at less selective public universities or two-year colleges, and less likely to enroll in private or out-of-state four-year universities than their white student counterparts, which suggests highly-qualified minority students are choosing lower quality Texas universities, rather than leaving the state for higher quality institutions.[4]

Table 2 presents the Ordinary Least Squares regression results predicting the probability that a student will choose to apply to a top-tier flagship university from the groups subject to guaranteed admissions (panel A) and holistic admissions (panel B). All regression specifications include indicators for race and ethnicity to measure the differential presence of undermatch. Because class rank is subjective to the standards and resources of each high school, we also control for more objective measures of college readiness. These college-ready controls are designed to identify students who are well qualified for a flagship university compared to the students who make up the prior year's freshman class. Columns 1 and 4 include controls for SAT scores (or ACT equivalent). We include indicator variables for a score above the flagship average (at least 0.5 SDs above the mean), a score near the flagship average (within 0.5 SDs of the mean), and the omitted category is a score below the flagship average (at least 0.5 SDs below the mean). Columns 2 and 5 control for both high school exit exam scores (composite $z$-score of language arts and mathematics) and advanced placement (AP) coursework. Specifically, students are characterized as "Better than a top-tier" if these observables are greater than the average of a top-tier's (*a highly selective flagship public university*) entering freshman from the prior year freshman class; students are "Better than a middle-tier" if these observables are lower than average for a top-tier university, but above average for a middle-tier (*a mid-range, somewhat selective public university*); students are "Better than a bottom-tier" if these observables are lower than average for a middle-tier university, but above average for a bottom-tier (*less selective public university*); and the omitted comparison group is a student who is "Worse than a bottom-tier" if these observables are below average for a bottom-tier's entering freshman class.[5] Lastly, in columns 3 and 6, the college-ready qualifications for top-, middle-, and bottom-tier universities are interacted with the student's race and ethnicity. Significant negative coefficients on race and ethnicity indicators suggest that

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[4] The cost of postsecondary education in Texas is about the same across universities and it is vastly more expensive to enroll out-of-state. For example, in 2006, the total cost of attendance (tuition, fees, plus room and board) at the flagship universities range from $11,919–$12,845; and the other selective universities total cost of attendance ranged from $7,445–$13,027. Thus, cost of attendance is not the driving mechanism behind the low application and enrollment at flagship universities of top 10 percent and top 11–25 percent students.

[5] Examples of top-, middle-, and bottom-tier institutions are, respectively, the University of Texas at Austin, the University of Texas at San Antonio, and the University of Texas at El Paso.

TABLE 2—OLS REGRESSION RESULTS: PROBABILITY OF APPLYING TO ANY TOP-TIER FLAGSHIP UNIVERSITY BY CLASS RANK

| | Panel A. Guaranteed admissions, top 10 percent students | | | Panel B. Holistic admissions, top 11–25 percent students | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Race and ethnicity* | | | | | | |
| Black | −0.043*** | −0.051*** | −0.073*** | 0.023*** | 0.021*** | 0.020*** |
| | (0.015) | (0.014) | (0.020) | (0.007) | (0.007) | (0.007) |
| Hispanic | 0.010 | −0.022** | −0.023 | 0.054*** | 0.038*** | 0.042*** |
| | (0.011) | (0.011) | (0.017) | (0.006) | (0.006) | (0.005) |
| Asian | 0.148*** | 0.098*** | 0.051 | 0.242*** | 0.212*** | 0.143*** |
| | (0.011) | (0.011) | (0.037) | (0.022) | (0.021) | (0.021) |
| *SAT scores*[a] | | | | | | |
| Better than flagships | 0.155*** | | | 0.148*** | | |
| | (0.010) | | | (0.013) | | |
| Near flagship average | 0.096*** | | | 0.070*** | | |
| | (0.009) | | | (0.007) | | |
| *College qualification*[b] | | | | | | |
| Better than a top-tier | | 0.308*** | 0.303*** | | 0.374*** | 0.375*** |
| | | (0.011) | (0.014) | | (0.026) | (0.032) |
| Better than a middle-tier | | 0.192*** | 0.185*** | | 0.133*** | 0.137*** |
| | | (0.009) | (0.012) | | (0.008) | (0.011) |
| Better than a bottom-tier | | 0.071*** | 0.068*** | | 0.033*** | 0.024*** |
| | | (0.010) | (0.014) | | (0.005) | (0.006) |
| *Interactions* | | | | | | |
| Black × Better than a top-tier | | | 0.109*** | | | 0.101 |
| | | | (0.035) | | | (0.104) |
| Black × Better than a middle-tier | | | 0.037 | | | −0.019 |
| | | | (0.024) | | | (0.019) |
| Black × Better than a bottom-tier | | | −0.005 | | | 0.021 |
| | | | (0.032) | | | (0.016) |
| Hispanic × Better than a top-tier | | | 0.012 | | | −0.113** |
| | | | (0.023) | | | (0.049) |
| Hispanic × Better than a middle-tier | | | −0.003 | | | −0.029** |
| | | | (0.018) | | | (0.013) |
| Hispanic × Better than a bottom-tier | | | 0.004 | | | 0.018* |
| | | | (0.021) | | | (0.010) |
| Asian × Better than a top-tier | | | 0.032 | | | 0.144*** |
| | | | (0.038) | | | (0.042) |
| Asian × Better than a middle-tier | | | 0.071** | | | 0.115*** |
| | | | (0.036) | | | (0.032) |
| Asian × Better than a bottom-tier | | | 0.049 | | | 0.021 |
| | | | (0.053) | | | (0.037) |
| Observations | 35,079 | 35,079 | 35,079 | 31,623 | 31,623 | 31,623 |
| $R^2$ | 0.144 | 0.171 | 0.171 | 0.105 | 0.128 | 0.131 |

*Notes:* Robust standard errors (shown in parentheses) are clustered at the high school level. See text for description of each column.

[a]SATs are compared to the average for students who enter one of the top-tier flagship campuses of the Texas higher education system. Specifically, "Better than flagships" is an SAT score >+0.5 SDs above the mean, "Near flagship average" is an SAT score within 0.5 SDs of the mean, and "Below the flagship average" (omitted group) is an SAT score <0.5 SDs below the mean.

[b]Student who is "Better than a top-tier" if AP semesters and high school exit exam scores (composite *z*-score of reading and mathematics) are above average for a top-tier's entering freshmen class; student who is "Better than a middle-tier" if AP semesters and exit exam are above average for entering freshman class at a middle-tier but not a top-tier university; student who is "Better than a bottom-tier" if AP semesters and exit exam are above average for entering freshman class at a bottom-tier but not a middle-tier university; and the omitted comparison group is a student who is "Worse than a bottom-tier" if AP semesters and exit exam are below average for a bottom-tier's entering freshman class. All regressions control for student's gender, age, foreign language ability, parental education, and family income. Mean flagship application rate for top 10 percent and top 11–25 percent students are 0.63 and 0.26, respectively.

  ***Significant at the 1 percent level.
  **Significant at the 5 percent level.
  *Significant at the 10 percent level.

minorities are undermatching, particularly for top 10 percent students since they are automatically admitted to a flagship university. Significant negative coefficients on the interactions between race/ethnicity and college-readiness levels indicate how the degree of undermatch varies with student achievement in high school. All regressions also include controls for other student demographics, family income, and whether the parents attended college. The omitted comparison group in all regression specifications is a student who is white and less qualified for college.

Results for the top 10 percent graduates who applied to college are shown in panel A of Table 2. As seen in column 1, controlling for SAT scores, black top 10 percent students are less likely to apply to a flagship university by 4.3 percentage points compared to white top 10 percent students, and there is no significant effect for Hispanic students. The coefficients on the SAT score variables indicate that students with scores above a flagship's average are more likely to apply to a flagship university by 15.5 percentage points, and those near the flagship average by 9.6 percentage points. Thus, SAT scores appear to provide students eligible for automatic admissions with information about their potential for success at flagship campuses. Column 2 shows a specification in which we control for college qualifications, as measured by performance on high school exit exams and AP coursework, instead of SAT scores. We observe that a student who performed better than the average for a top-tier university increases her likelihood of applying to a flagship by 30.8 percentage points, and performing better than average for less selective universities has a smaller, but still positive effect on application to a flagship campus. Without controls for SAT scores, there is a large negative effect of both black and Hispanic application: black and Hispanic top 10 percent students are less likely to apply to a flagship university by 5.1 and 2.2 percentage points, respectively. Adding interactions between race/ethnicity and college qualifications (column 3), we find that qualification for a top-tier university has a large, positive effect on black top 10 percent student application. This result suggests that black undermatch is offset for black students whose prior performance is comparable to other flagship students.

Next, panel B of Table 2 presents the results for students in the top 11–25 percent who are subject to holistic admissions at flagship

universities. For the top 11–25 percent students, the relevant coefficients of interest, which gauge the extent of undermatch, are the interactions between race/ethnicity and college-ready performance measures for top-, middle-, and bottom-tier universities. Most notable in this analysis, we observe a large, negative coefficient on the interaction between Hispanic and better than a top-tier university (see column 6), indicating that the most qualified Hispanic students are less likely to apply to flagship campuses than other equally qualified students, by 11.3 percentage points. This result suggests a large problem of academic undermatching among high-performing Hispanic students who face holistic admissions. Hispanic students are less likely to compete for admission to elite flagship universities even though their coursework and high school performance exceed the average for actual flagship students.

### III. Concluding Remarks

Postsecondary education is the pathway to social mobility in the United States. Yet, too often high-achieving students from low-income families and racial/ethnic minorities fail to apply to selective postsecondary institutions. This study builds on our earlier work on application decisions and examined the extent to which academic undermatching occurs among high-achieving minority students by analyzing the application choices of students who undergo two distinct admissions policies.

There are three main takeaways from this analysis. First, the phenomenon of undermatch can occur even if students have perfect information that they will be admitted. This is apparent from our finding that automatically-admitted black students are less likely to apply to flagship institutions than white students with similar SAT scores and college readiness. Second, even when admission is guaranteed, students use additional information, such as SAT scores or prior achievement, to inform college application decisions. In our results, black undermatch is offset only when students have college readiness superior to the average student at an elite public university. Third, undermatch is also influenced by admissions processes, as evidenced by our results for Hispanic students who must undergo holistic admissions. For this population, eligibility for automatic admissions appears to

influence applications, even when students are highly qualified. Overall, we find that automatic admissions contributes to minority application to elite universities, but is not sufficient to fully overcome obstacles potentially related to students' expectations about their likelihood for success after enrollment.

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