Can Admissions Percent Plans Lead to Better Collegiate Fit for Minority Students?[†]

By Kalena E. Cortes and Jane Arnold Lincove*

One of the most important decisions we make in life is where to go to college. Ideally, we want students to choose a college that maximizes not only their academic success but also their social well-being and lifetime earnings potential. However, past studies have documented the phenomena of both *undermatch* and *overmatch*—whereby some high-achieving students fail to enroll at highly selective colleges while some low-achieving students do enroll at these institutions (Black and Smith 2004; Light and Strayer 2000; Dillon and Smith forthcoming). Recent studies have focused on high-achieving, low-income students and find substantial undermatching among highly qualified students with low family resources (Griffith and Rothstein 2009; Hoxby and Avery 2013; Hoxby and Turner 2013; Smith, Pender, and Howell

2013). These students, who face the greatest potential for social mobility, fail to apply to prestigious universities despite the availability of generous financial aid. Black, Cortes, and Lincove (2015a; 2015b) also find concerning racial and ethnic differences in college application behavior, with Hispanics less likely to apply to college overall and blacks more likely to undermatch in college applications than white students.

The general consensus in the student-college fit literature is that most of the observed mismatch stems from the application behavior of students, and not from the admission decisions by colleges (Dillon and Smith forthcoming). A plausible explanation for the observed mismatch among students is a lack of information about college quality and admissions processes (Hoxby and Avery 2013). In particular, low-income and minority students whose parents did not attend college might lack information about their prospects for acceptance, compared to more affluent white students with college-educated parents. If this hypothesis is correct, public university automatic admissions policies, which provide a priori information about the likelihood of acceptance, might improve minority students' college matching.

Our study contributes to the existing research on student-college matching by examining mismatch in a setting where some students have perfect admissions information due to a state policy in Texas. We examine college enrollment behavior of two cohorts of high school graduates, which include large minority populations. These students were subject to a unique state policy, the Top 10% Plan, which provides perfect information about college admissions well in advance of application. Texas was among the first states to implement an admissions "percent plan" and is the only state that grants automatic admissions solely on the basis of class rank (Black, Cortes, and Lincove forthcoming).

Specifically, the policy guarantees admission into any Texas public university to all high school seniors who finish their junior year within the top decile of their high school graduating class. Also, unlike other percent plans, Texas offers institutional choice, including to the highly selective flagship campuses of the University of Texas at Austin and Texas A&M University, whereas under other states' percent plans, the university-wide system assigns the campus. Given that admissions under this percent plan is based on class rank alone and also provides institutional choice, the Top 10% Plan has both the potential to *mitigate undermatch* in high-achieving students by providing perfect information about admissions to their choice of institution, as well as to *exacerbate overmatch* in students with low college readiness by providing automatic admissions based solely on class rank regardless of all other measures of college qualifications.

Relative to the existing research on student-college fit, our analysis here provides several new insights. First, we are able to directly examine the role of admissions information in college matching decisions in enrollment. We do this by comparing academic mismatch behavior of otherwise similar students who are and are not eligible for automatic admissions. Second, because Texas's automatic admissions policy admits students based on class rank alone, we are also able to observe college choices for students not previously studied—those with automatic admissions through having achieved a high class rank, but also low college readiness as measured by SAT or ACT exams. This enables analysis of both undermatch and overmatch. Our results support the hypothesis that a priori admissions information can vastly improve minority access to college quality by encouraging eligible students to apply to, and more importantly, enroll in more challenging institutions.

I. Data Sources

We use restricted student-college matched administrative data for all Texas public university enrollees who graduated from a Texas public high school in 2008 and 2009, provided through the Education Research Center (ERC) at the University of Texas at Austin. High school measures of college readiness (SAT or ACT

equivalent, exit exam scores, and advanced placement courses completed), and eligibility for automatic admissions were obtained from each student's high school academic records and college applications. Student demographics and family income were obtained from high school enrollment records, college applications, and financial aid forms.

The outcome of interest in this study is academic match quality, as measured by the distance between a student's SAT score (or ACT equivalent) and the median at the campus where she ultimately enrolled. We used merged college application and enrollment files to calculate the statewide SAT percentile ranks for all college applicants and to place individual students and campus medians within the state distribution. We define overmatch and undermatch based on the difference between a student's SAT percentile and the percentile of the campus's median SAT score.[1] Undermatch occurs if the student's SAT score is more than 20 percentile points above the lagged campus median, and overmatch occurs if the student's SAT score is more than 20 percentile points below the lagged campus median. Campus aggregates were calculated based on enrollment in the year prior to each student's high school graduation to reflect how the student would observe the campus in the year she applied to college.

II. Empirical Findings and Discussion

Table 1 presents summary statistics for the full sample of enrollees (panel A) and by enrollees' race and ethnicity (panel B). Among all enrollees, approximately 19 percent of the sample is overmatched by more than 20 SAT percentile points, and 18 percent of the sample is undermatched. However, there is a distinct pattern of college mismatch by race and ethnicity. Overmatch rates among black and Hispanic students are 29 and 25 percent, respectively, while overmatch rates for Asian and white students are only 15 and 13 percent, respectively. In terms of undermatch, we observe the reverse pattern: black and Hispanic students undermatch in college enrollment by only 9 and 15 percent, respectively, compared to 18 percent of Asian

---

[1] Our overmatch and undermatch classification is based on Dillon and Smith's (forthcoming) definition.

TABLE 1—SUMMARY STATISTICS OF COLLEGE ENROLLEES BY STUDENT CHARACTERISTICS

	Panel A. All enrollees	Panel B. Enrollees by race and ethnicity			
		Black	Hispanic	Asian	White
SAT match quality of college campus[a]					
Overmatched by 20 or more percentile points	0.185	0.289	0.249	0.149	0.129
	(0.388)	(0.453)	(0.432)	(0.356)	(0.335)
Undermatched by 20 or more percentile points	0.178	0.091	0.145	0.184	0.218
	(0.383)	(0.287)	(0.352)	(0.387)	(0.413)
Class rank bins					
Proportion eligible for automatic admissions (top 10 percent)	0.275	0.138	0.264	0.400	0.297
	(0.446)	(0.345)	(0.441)	(0.490)	(0.457)
Proportion in top 11–25 percent	0.227	0.176	0.244	0.166	0.240
	(0.419)	(0.381)	(0.429)	(0.372)	(0.427)
Proportion in bottom 75 percent	0.499	0.686	0.492	0.434	0.463
	(0.500)	(0.464)	(0.500)	(0.496)	(0.499)
High school characteristics[b]					
Percent black	0.132	0.350	0.074	0.162	0.103
	(0.159)	(0.239)	(0.114)	(0.128)	(0.101)
Percent Hispanic	0.393	0.333	0.688	0.282	0.265
	(0.288)	(0.190)	(0.294)	(0.188)	(0.184)
Percent free and reduced lunch eligibility	0.393	0.479	0.589	0.287	0.281
	(0.247)	(0.211)	(0.257)	(0.197)	(0.171)
Percent took Advanced Placement (AP) test	0.237	0.202	0.226	0.286	0.244
	(0.147)	(0.130)	(0.139)	(0.146)	(0.152)
Percent enrolled at four-year university	0.359	0.311	0.352	0.408	0.368
	(0.143)	(0.114)	(0.162)	(0.145)	(0.135)
Observations	93,860	12,404	25,965	6,980	48,511

Notes: Standard deviations are in parentheses.

   [a]Student and campus SAT percentiles are calculated based on all applicants to Texas public universities within each academic year. Overmatch and undermatch are identified based on the difference between the student's SAT percentile and percentile of the campus's median SAT score (lagged one year). Overmatch occurs if the student's SAT score is more than 20 points below the lagged campus median. Undermatch occurs if the student's SAT score is more than 20 above the lagged campus median.

   [b]High school characteristics are measured during the student's junior year.

Sources: Authors' calculations based on 2008 and 2009 student cohort data from the Texas Education Research Center (ERC) at the University of Texas at Austin. Our dataset includes Texas public high school graduates from spring 2008 and spring 2009 who also enrolled full-time at a Texas public university the following fall. The 2008 and 2009 high school graduates enrolled at one of 31 Texas public universities including the elite flagship universities (University of Texas at Austin and Texas A&M University at College Station), other top 10 percent campuses, and open enrollment institutions.

and 22 percent of white students. At the same time, black and Hispanic students attend high schools with lower average college readiness and college-going rates, and whites and Asians are more likely to benefit from automatic admissions. Thus, regression analysis with controls is needed to isolate the effects of automatic admissions, given that students from different racial and ethnic backgrounds vary in both college preparation and class rank.

Our empirical objective is to estimate the effects of race/ethnicity on the propensity to undermatch/overmatch and the mediating effects of a priori admissions information provided through the top 10 percent admissions policy. We estimate the probability that a student mismatches in college enrollment as a function of race/ethnicity, admissions status (as observed through class rank), SAT percentile rank, other measures of college readiness

(high school exit exam score and AP courses completed), and student demographics (gender, mother's education, and family income). We also include high school fixed effects to control for differences in high school quality, and thus we estimate on differences across students of different races/ethnicities from the same high school. We are able to identify three categories of admissions status: top 10 percent students who are guaranteed admissions and have full admissions certainty, top 11–25 percent students who have a high probability of admissions in a holistic review process, and bottom 75 percent students who have a less likely admissions status. Because admissions certainty might operate differently for low- and high-achieving students, we also estimate the probability of undermatch for students with high SAT scores (top 25 percent statewide) and the probability of overmatch for students with low SAT scores (bottom 25 percent statewide). We then add interaction terms for race/ethnicity and class rank to see if automatic or likely admissions affects matching differently for minority students.

Table 2 presents the Ordinary Least Squares regression results predicting the probability that a student undermatches or overmatches in college enrollment versus attending a well-matched institution. As shown in column 1 of Table 2, in the full enrollment sample (panel A), the probability of undermatch is reduced by 13.6 percentage points for a top 10 percent student and 3.2 percentage points for a top 11–25 percent student, relative to a similar student in the bottom 75 percent at the same high school. The comparison between the top 10 percent and the reference group (bottom 75 percent) measures the combined effect of perfect admissions information and higher class rank, while the comparison between top 11–25 percent and the reference group provides the stand-alone effect of higher class rank without guaranteed admissions. The results in column 1 indicate that, ceteris paribus, black students are significantly more likely to undermatch than whites by 6 percentage points. The within-high school difference between Hispanics and white students is not statistically significant, and Asians are significantly less likely to undermatch than white students.

In column 2 of Table 2, we add interactions between race/ethnicity and class rank to the

specification on the full sample. Despite guaranteed admissions, top 10 percent students who are black or Hispanic are significantly more likely to undermatch in college enrollment by 2.7 and 6.8 percentage points than white top 10 percent students from the same high school, while Asian top 10 percent students are less likely to undermatch than whites by 7.4 percentage points. Looking at students with uncertain admissions, top 11–25 percent black students are less likely to undermatch by 1.7 percentage points, but Hispanic students continue to undermatch by 2.4 percentage points compared to similar white top 11–25 percent students. Top 11–25 percent students are an interesting group because these students underwent a more traditional holistic admissions process that included race/ethnicity as one of many background factors. Interestingly, black undermatch is less likely for these students who undergo holistic admissions, but admissions that considers ethnicity is no help for Hispanic students who are top 11–25 percent. Nevertheless, it is quite worrisome that black and Hispanic top 10 percent students, who have full information regarding their admissions prospects at better-matched institutions, are more likely to undermatch in college enrollment.

A tenet of the Top 10% Plan is that admissions is solely based on class rank regardless of students' college preparedness. Thus, by dividing our sample by SAT performance, we can better identify the dynamics of admissions policy and race/ethnicity for groups of students who have a similar choice set of well-matched versus mismatched institutions. Panels B and C of Table 2 show regression results by SAT quartile to provide insight into whether the Top 10% Plan decreases undermatching for the top SAT quartile or increases overmatching for the bottom SAT quartile. As observed in column 3 of panel B, top 10 percent students who have high SATs are 32 percentage points less likely to undermatch relative to students who are ranked at the bottom 75 percent. Within the high-SAT group, we see no significant differences for black and Hispanic students, and Asians are less likely to undermatch compared to whites, ceteris paribus. However, adding interactions for race/ethnicity and class rank (column 4), we find significant negative interactions between top 10 percent and black, Hispanic, and Asian indicators. This suggests that among students with

TABLE 2—ORDINARY LEAST SQUARES REGRESSIONS OF THE PROBABILITY OF UNDERMATCH/OVERMATCH IN COLLEGE ENROLLMENT

	Panel A. Sample includes all students[a], undermatch by 20+ points		*Panel B. Top 25% of SAT[b], undermatch by 20+ points*		*Panel C. Bottom 25% of SAT[c], overmatch by 20+ points*	
	(1)	(2)	(3)	(4)	(5)	(6)
High school class rank						
Top 10% student	−0.136***	−0.150***	−0.323***	−0.304***	0.242***	0.109***
	(0.003)	(0.004)	(0.008)	(0.009)	(0.013)	(0.034)
Top 11–25% student	−0.032***	−0.036***	−0.119***	−0.116***	0.153***	0.074***
	(0.003)	(0.004)	(0.008)	(0.010)	(0.009)	(0.020)
Race and ethnicity						
Black	0.061***	0.058***	−0.009	0.042	−0.256***	−0.319***
	(0.004)	(0.005)	(0.018)	(0.026)	(0.013)	(0.014)
Hispanic	0.005	−0.017***	0.001	0.030*	−0.026**	−0.019
	(0.004)	(0.004)	(0.010)	(0.017)	(0.012)	(0.013)
Asian	−0.034***	−0.002	−0.038***	−0.010	0.021	−0.049*
	(0.005)	(0.007)	(0.010)	(0.016)	(0.023)	(0.028)
Interactions with class rank						
Top 10% × Black		0.027***		−0.133***		0.366***
		(0.010)		(0.039)		(0.040)
Top 10% × Hispanic		0.068***		−0.064***		0.032
		(0.006)		(0.021)		(0.037)
Top 10% × Asian		−0.074***		−0.056***		0.238***
		(0.010)		(0.019)		(0.066)
Top 11–25% × Black		−0.017*		−0.013		0.284***
		(0.009)		(0.046)		(0.026)
Top 11–25% × Hispanic		0.024***		−0.003		−0.003
		(0.006)		(0.025)		(0.023)
Top 11–25% × Asian		−0.003		0.006		0.189***
		(0.012)		(0.026)		(0.052)
College readiness						
SAT percentile rank	0.956***	0.958***	0.795***	0.792***	−1.812***	−1.837***
	(0.007)	(0.007)	(0.047)	(0.047)	(0.052)	(0.051)
Exit exam percentile rank	−0.052***	−0.057***	−0.095***	−0.095***	0.115***	0.120***
	(0.007)	(0.007)	(0.022)	(0.022)	(0.018)	(0.018)
AP semesters completed	−0.008***	−0.007***	−0.013***	−0.013***	0.010***	0.010***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	93,860	93,860	25,842	25,842	18,066	18,066
R^2	0.222	0.224	0.135	0.136	0.134	0.151
Other controls						
Demographics[d]	Yes	Yes	Yes	Yes	Yes	Yes
High school fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns 1–6 show estimates from linear probability models of the probability of undermatch/overmatch in college enrollment. Undermatch occurs if the student's SAT score is more than 20 points above the lagged campus median. Overmatch occurs if the student's SAT score is more than 20 points below the lagged campus median. Robust standard errors are shown in parentheses.

[a] Panel A: predicted probability of undermatch for all enrolled students.
[b] Panel B: predicted probability of undermatch for students with high SATs.
[c] Panel C: predicted probability of overmatch for students with low SATs
[d] Regressions also control for graduation year, gender, age, parental education, and family income.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

high SAT scores, automatic admissions reduces undermatch tendencies for minority students more than similar white students, potentially closing a gap in access to academically rigorous campuses.

Finally, we compare the effects of race/ethnicity and automatic admissions for students with low SATs who might overmatch in college enrollment due to the Top 10% Plan. Without interaction terms (panel C, column 5), we estimate that top 10 percent students are more likely to overmatch by 24 percentage points, but black students are less likely to overmatch than whites by over 25 percentage points, ceteris paribus. Hispanics are less likely to overmatch than whites by a smaller, but still significant, 2–3 percentage point margin. Adding interactions for race/ethnicity and class rank (column 6), we find that automatic admissions fully reverses the estimated gap between black and white students. The net effect of being black (-0.319) and in the top 10 percent ($+0.366$) means that top 10 percent black and white students might have similar probabilities of overmatch, ceteris paribus. Coefficients for Hispanic and interaction terms between top 10 percent and Hispanic are not statistically significant, suggesting that Hispanics with low SATs behave toward undermatch in ways that are similar to white students, ceteris paribus.

III. Concluding Remarks

Racial and ethnic differences in college mismatch can derive from different levels of college preparation and high school quality or from different sources of information about college, different expectations from families and teachers, or different expectations about future success. In this study, we estimate racial and ethnic differences in college mismatch behavior that are robust to controls for demographics, observable college readiness, and high school attended. There are three main takeaways from this analysis. First, the phenomena of undermatch and overmatch can occur even if students have perfect information. Second, we find that automatic admissions mitigates some racial/ethnic differences in college mismatch behavior. Minority students who are eligible for automatic admissions often behave toward campus matching in ways that are more similar to whites than students who have uncertainty. We find that automatic admissions prevents black and Hispanic students with high SATs from undermatching and also encourages black students with low SATs to overmatch. Third, automatic admissions only mitigated minority undermatch when students also had high SAT scores. Thus, automatic admission policies interact with other signals in student enrollment decisions. Overall, our results support the hypothesis that perfect admissions information can improve college matching for high-performing minority students and also induce overmatching for low-performing minority students with high class rank. It is unclear if similar effects would occur if less-than-perfect signals of admissions were offered, as we typically find smaller effects of top 11–25 percent class rank (likely admissions) than top 10 percent (certain admissions).

REFERENCES

Black, Dan A., and Jeffrey A. Smith. 2004. "How Robust is the Evidence on the Effects of College Quality? Evidence from Matching." *Journal of Econometrics* 121 (1-2): 99–124.

Black, Sandra E., Kalena E. Cortes, and Jane Arnold Lincove. Forthcoming. "Efficacy vs. Equity: What Happens When States Tinker with College Admissions in a Race-Blind Era?" *Educational Evaluation and Policy Analysis.*

Black, Sandra E., Kalena E. Cortes, and Jane Arnold Lincove. 2015a. "Academic Undermatching of High-Achieving Minority Students: Evidence from Race-Neutral and Holistic Admissions Policies." *American Economic Review* 105 (5): 604–10.

Black, Sandra E., Kalena E. Cortes, and Jane Arnold Lincove. 2015b. "Apply Yourself: Racial and Ethnic Differences in College Application." National Bureau of Economic Research Working Paper 21368.

Dillon, Eleanor W., and Jeffrey A. Smith. Forthcoming. "The Determinants of Mismatch between Students and Colleges." *Journal of Labor Economics.*

Griffith, Amanda L., and Donna S. Rothstein. 2009. "Can't Get There from Here: The Decision to Apply to a Selective College." *Economics of Education Review* 28 (5): 620–28.

Hoxby, Caroline, and Christopher Avery. 2013. "The Missing 'One-Offs': The Hidden Supply of High-Achieving, Low-Income Students." *Brookings Papers on Economic Activity* (Spring): 1–61.

Hoxby, Caroline, and Sarah Turner. 2013. "Expanding College Opportunities for High-Achieving, Low Income Students." Stanford Institute for Economic Policy Research Discussion Paper 12-014.

Light, Audrey, and Wayne Strayer. 2000. "Determinants of College Completion: School Quality or Student Ability?" *Journal of Human Resources* 35 (2): 299–332.

Smith, Jonathan, Matea Pender, and Jessica Howell. 2013. "The Full Extent of Student-College Academic Undermatch." *Economics of Education Review* 32 (1): 247–61.