

**Hispanics and the “Mismatch” Hypothesis:
Differentials in College Graduation Rates by Institutional Selectivity**

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Abstract: This paper evaluates the “mismatch” hypothesis, advocated by opponents of affirmative action, which predicts that graduation rates of minority students are lower at selective post-secondary institutions compared with colleges and universities where their academic credentials are better matched to the institutional average. Using two nationally representative longitudinal surveys (HS&B and NELS) and a unique survey of students enrolled at selective and highly selective institutions (C&B), we test the “mismatch” hypothesis by implementing a robust methodology that jointly considers enrollment in and graduation from selective institutions as interrelated outcomes. Not only do we reject the “mismatch” hypothesis for Hispanics, but we also confirm Bowen and Bok’s claims about black students enrolled at the most selective institutions during the late 1980s. The C&B data indicate that strong mentoring programs and more lucrative financial aid packages contribute to higher minority graduation rates at the most selective institutions.

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Introduction

Waning support for affirmative action during the 1990s challenged the research community to justify consideration of race as a legitimate factor in college admissions decisions. Critics of affirmative action allege that treating race and ethnicity as a plus factor for purposes of admissions to selective and highly selective institutions sets up minorities for failure because they are putatively unprepared to succeed academically (Graglia 1993; Sowell 2003). Dubbed the “mismatch” hypothesis, the basic claim is that the lower average graduation rates of “affirmative admits” result from a mismatch between their academic preparation and the scholastic requirements of the schools that admitted them by taking race into account (Pell 2003).¹ Presumably, the “mismatched” minority students become demoralized, underperform, and ultimately fail to graduate (Crawford 2000; Thernstrom and Thernstrom 1999; Lerner and Nagai 2001; Pell 2003). This logic implies that a better match between the academic credentials of minority students with the average of institutions they attend will lead to stronger performance, including higher graduation rates and post-graduate activities (Arkes 1999).

Affirmative action critics cite lower black and Hispanic academic credentials—especially standardized college entrance test scores and high school grades—to support claims that black and Hispanic students are misplaced at the most selective institutions

¹ Bowen & Bok use the term “fit” to portray this hypothesis, but we prefer the term “mismatch” because it succinctly captures the essence of the debate, namely that minority students with lower credentials are “mismatched,” and thus have worse outcomes.

(Pell 2003; Graglia 1993). Demonstrating that black student graduation rates increase as selectivity of admissions rises, and that this generalization obtains for all intervals of the SAT distribution, Bowen and Bok (1998) challenged the merits of the “mismatch” hypothesis. Not only do their findings dispute allegations that black students can not succeed at selective colleges and universities, but they also demonstrate a consistent positive association between institutional selectivity and several post-graduation outcomes, including completion of advanced degrees, earnings, and overall satisfaction with their college experience (Dworkin 1998). Attending to the same question, Kane (1998) argues that affirmative action narrows rather than widens gaps in college retention rates by race because the net relationship between college selectivity and college graduation rates is positive for all students.

As the first rigorous assessment of the social costs and benefits of affirmative action for students and institutions, Bowen and Bok’s treatise provides a powerful benchmark for further verification. However, its emphasis on racial differences neglects the most rapidly growing segments of the college population, namely Hispanics and Asians.² Furthermore, the focus on colleges and universities with selective and highly selective admissions limits the scope of evidence in two significant ways. First, although the “College and Beyond” (C&B) institutional sample used by Bowen and Bok represents appreciable variation in the selectivity of admissions criteria, it excludes non-selective institutions, which account for the vast majority of undergraduate higher education in the

² The authors were aware of this limitation and were directly responsible for ensuring that the college-going behavior of Hispanics was studied with the C&B data. This research derives from that effort.

United States. Evaluating the “mismatch” hypothesis among selective and nonselective postsecondary institutions broadens the foundation on which Bowen and Bok’s claims rest. Second, their institutional sample excludes the premier public institutions in the two states with the largest Hispanic (and Asian) populations, namely Texas and California.

The latter limitation of the C&B institutional sample is more consequential for Hispanics than for blacks because the major public flagships of the Southwest, namely the University of Texas at Austin, Texas A & M, the University of California at Berkeley and UCLA are excluded. Although the C&B institutional sample includes at least one premier private institution each from Texas (Rice) and California (Stanford), the comparatively low in-state tuition of the public flagships makes them especially attractive to students of all income levels, especially those for whom private school tuition is out of reach.³ Ascertaining whether and how Hispanic students enrolled in nonselective institutions fare relative to their counterparts who attend selective colleges and universities is crucial to evaluate more fully the merits and implications of the “mismatch” hypothesis.

Accordingly, in this paper we evaluate the “mismatch” hypothesis by extending the arguments presented in *The Shape of the River* in three important ways. First, in addition to the C&B data used by Bowen and Bok (1998), we analyze two nationally representative data sets that include both selective and non-selective post-secondary institutions in order to determine whether, in fact, the generalizations based on a subset of

³ According to U.S. News and World Report (2003), in-state tuition and fees for University of California at Berkley, University of California at Los Angeles, and University of Texas at Austin was around \$4200, compared to \$27,204 and \$17,526 for Stanford and Rice, respectively.

selective and highly selective institutions also obtain for the full range of institutional selectivity. The analyses reported here use two nationally representative samples of public and private colleges and universities that represent the full range of selectivity from highly selective to open-door post-secondary institutions. This extension addresses criticisms about distortions stemming from truncation biases.

Second, we focus on Hispanics, whose position in higher education has been relatively understudied compared with blacks. Although Hispanics are notorious for their educational underachievement, particularly their persistent and elevated rate of high school noncompletion (Fry 2003), understanding their success in higher education—both who gains admission to and who graduates from selective institutions—holds promise for the design of policy geared to improve their standing in post-secondary institutions and beyond. Multi-group comparisons based on nationally representative data not only situate Hispanics in the broader terrain of higher education, but also validate findings for blacks based on a subset of selective institutions.

Finally, rather than assume that the allocation of individuals to colleges and universities that differ in the selectivity of their admissions is exogenous to subsequent academic success, we devise two analytical strategies that overcome this problem. First we simultaneously model enrollment in selective and nonselective institutions and the likelihood of graduation; second, we assess the likelihood of graduation for groups with similar characteristics and similar propensity to attend a selective and highly selective institutions (Rosenbaum and Rubin 1983). Bowen and Bok did not explicitly model minority students' assignment to selective versus nonselective institutions, in part

because their sample was restricted to the most competitive colleges and universities and thus has a more limited range of institutional and individual academic qualifications.⁴ If the selection regime is ignored, then measured effects of attending a selective institution could reflect unmeasured influences that are correlated both with institutional assignment and college graduation.⁵ For example, drawing from the tracking literature that shares a similar problem, Gamoran and Mare (1989) show that because assignment to high school tracks favors blacks who are equal on other characteristics, tracking appears to compensate for preexisting differences between the races (also see Betts and Shkolnic 2000).

Because the determinants of attending a selective institution and graduating from college overlap to a large extent, it is necessary to jointly estimate these outcomes in order to obtain unbiased estimates for the mismatch parameters. This is particularly so if the conditional probability of attending selective institutions differs for minority and nonminority populations of varying academic qualifications, that is, if institutions practice affirmative action. Following the landmark *Bakke* decision,⁶ the most selective institutions considered race as one of many factors in making admissions decisions (Bowen and Bok 1998). Therefore, modeling the graduation outcomes jointly with the assignment process not only has methodological importance, but also substantive implications for the implementation of affirmative action practices.

⁴ Many other studies focused on students attending selective institutions share this limitation (e.g., Kane 1998)

⁵ An analytic strategy that does not model assignment to selective institutions assumes uncorrelated errors between both outcomes, which we demonstrate is not correct.

⁶ *Regents of University of California v. Bakke*, 438 U.S. 265, 1978.

There are additional substantive reasons for re-evaluating the “mismatch” hypothesis focusing on Hispanic students. First, knowledge of the extent to which Hispanics enroll and graduate from postsecondary institutions with selective admissions is virtually nonexistent. In part this is because the Hispanic “drop-out” problem has dominated the interest of researchers and policy makers (Fry 2002; 2003; Tienda and Simonelli 2001). Second, although blacks are generally poorer than Hispanics as a group, the latter share a disadvantage that is uniquely relevant for higher education, namely, their parents often lack high school diplomas and thus larger shares are first generation college goers (Bean and Tienda 1987). Parental immigrant status is partly responsible for this difference, but it is not the only factor. Third, the average Hispanic-white test score gap is lower than the race gap in test scores (Alon 2001; Alon 2003b; Ahituv and Tienda in press). This has potentially important implications both for the likelihood of admission to selective institutions, and the conditional probability of graduation, given enrollment. Bowen and Bok (1998) showed that for black students the “mismatch” hypothesis was unsupported by empirical data and we hypothesize that it is also unsubstantiated for Hispanics, despite their lower educational standing vis-à-vis blacks.

In what follows, we elaborate the testable implications of the “mismatch” hypothesis, formulate a strategy for evaluating them, and explore reasons for the positive association between institutional selectivity and graduation rates. Following a general overview of recent trends in Hispanic college enrollment and graduation, we develop an empirical estimation strategy to test the “mismatch” hypothesis while considering

differential student allocation among selective and nonselective institutions. After describing the three data sources used for empirical estimation, we report the statistical results and conclude with a discussion of policy implications in light of the recent Supreme Court decisions on the Constitutionality of affirmative action in college admission (*Grutter v. Bollinger* and *Gratz v. Bollinger*).⁷

The main finding is that attending a more selective school benefits all students based on timely graduation, conditional on admission. Not only do we reject the “mismatch” hypothesis for Hispanics, but we also confirm Bowen and Bok’s claims about black students enrolled at the most selective institutions during the late 1980s. To understand why minority students thrive in selective institutions despite their disadvantaged starting lines, we scrutinize institutional differences in resources that facilitate persistence and timely graduation. The C&B data reveal that strong mentoring programs and more lucrative financial aid packages contribute to higher minority graduation rates at the most selective institutions.

Background and Theoretical Considerations

Hispanic rates of college enrollment have risen steadily over the past two decades. According to the US Department of Education’s National Center for Education Statistics [NCES] (2003:94-5), 22 percent of Hispanics ages 18-24 were enrolled in post-secondary institutions in 2000 compared with 16 percent in 1980. However, these figures understate their college-going rate because large numbers fail to complete high school, including

⁷ *Grutter v. Bollinger*, 123 S. Ct. 2325 (2003); *Gratz v. Bollinger*, 123 S. Ct. 2411 (2003).

recent immigrants who never enter the U.S. formal education system (Fry 2003).

Restricting this comparison to high school graduates, Hispanic enrollment in colleges and universities is more favorable, rising from 30 to 36 percent during the last two decades. The 20-year increase in Hispanic college-going compares with parallel increases for white youth, from 32 to 44 percent, and for black youth from 28 to 39 percent. College enrollment rates for Hispanic high school graduates who also are US citizens reached an all-time high of 43 percent in 2000 (US DEPT OF ED, NCES 2003).⁸

Although large race/ethnic disparities in college enrollment are greatly reduced by restricting the population base to high school graduates, or to US citizens, their completion rates are less impressive. A recent study by the Pew Hispanic Center (Fry 2002) notes that Hispanic high school graduates have a higher probability of attending college than other demographic groups, but a significantly lower probability of graduating. This apparent puzzle has rather straightforward explanations. To a large extent their higher college enrollment probability reflects the more selective student population eligible to enroll both because the vast majority of the low performing students withdraw before completing secondary school, and because many recent immigrants who never enter the public education system are included among the noncompleters (Fry 2003). More pertinent for our concern with the “mismatch” hypothesis is Fry’s (2002) finding that Hispanics’ lower average probability of college

⁸ Enrollment rates reported by the NCES are somewhat lower than those reported by the Bureau of Labor Statistics (BLS). This is because NCES uses a wide cohort age band, while BLS computes the annual rate for a high school graduation cohort. Using a high school graduation cohort rather than a broad age cohort, BLS reports college enrollment rates of white youth at 64 percent, black youth at 56.2 percent and Hispanic youth at 53 percent (See BLS, 2001).

graduation reflects their disproportionate enrollment in community colleges, vocational schools, and technical institutes that do not grant four-year degrees (Tienda and Simonelli 2001; Fry 2002). He estimates that 40 percent of Hispanic college enrollees attend two-year institutions (with trivial differences across generations) compared with approximately one quarter of whites (24 percent) and blacks (28 percent) and only 20 percent of Asians (Table 10).⁹

The controversy about affirmative action in college admissions, and the derivative “mismatch” hypothesis, is about access to the most selective post-secondary institutions in the nation. Although many factors determine the selectivity of admissions, ultimately two barometers are singled out for ranking post-secondary institutions, namely the average SAT score of their freshman class and the percent of applicants admitted (Barron’s 2003; Bowen and Bok 1998; Greenberg 2002; U.S. News and World Report 2003). Based on the 1650 institutions recorded in the 2003 Barron’s, only 64 institutions, or 3.9 percent, are classified as “most competitive.” According to Greenberg (2002: 526), the nation’s twenty-five most highly selective universities offer about 50,000 slots annually. Rising demand for a relatively fixed number of slots at the most competitive institutions has certainly fueled growing disapproval of affirmative action in college admissions, but so too has the growing belief that standardized scores on college entrance exams are both reliable criteria for establishing admission cutoffs and infallible predictors

⁹ Fry also notes that Hispanics are more likely to be part-time students, which increases their odds of noncompletion.

of success.¹⁰ That minority students typically average lower scores on standardized college entrance exams is used to justify claims about their unsuitability to attend selective institutions where the average SAT score is well above the minority group average (Arkes 1999; Graglia 1993; Lerner and Nagai 2001; Pell 2003).

The “mismatch” hypothesis implies that Hispanics enrolled in institutions with selective and highly selective admissions have a lower probability of graduating than their counterparts with similar test scores who attend institutions with less selective admission criteria. Analytically, the hypothesis has two related, but separable components: (1) group differences in the probability of *attending* a selective institution; and (2) group differences in the probability of *graduating from* institutions that differ in the selectivity of their admissions. Graduation from a selective institution is conditional on being admitted, which itself is a highly discriminating process influenced by many of the same factors that ultimately determine college graduation. This implies that the errors of the prediction equations for both outcomes are likely to be correlated, and hence must be jointly estimated to obtain unbiased estimates (Pindyck and Rubinfeld 1998).

High school achievements, indexed by grades, class rank, and performance on standardized college entrance examinations, are the strongest predictors of admission to a selective post-secondary institution (Karen 2002; Hearn 1984; 1991; Davies and Guppy 1997). Expressed formally,

$$\Pr(\mathbf{S})_{ij} = \alpha + \beta_j \mathbf{M}_{ij} + \gamma \mathbf{T}_i + \mathbf{X}_i + \varepsilon, \quad (1)$$

¹⁰ This is evident in the small industry that developed over the past two decades to prepare students, mainly from middle and upper middle classes, to improve their SAT scores (McDonough, 1994).

where,

S = an index of institutional selectivity;

M_j = 1 if member of a minority group, 0 otherwise, and j = 1, 2, 3 for Hispanics, blacks, and Asians, respectively;

T = standardized test scores (SAT);

X = a vector of attributes that influence college enrollment, and

ε = an error term.

Because more selective institutions require higher SAT scores as a condition of admission, $\gamma > 0$. Under admission regimes that permit affirmative action, $\beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3$. Moreover, the “mismatch” hypothesis requires enrollment of blacks and Hispanics with academic credentials below those of the institutional average, so that

$$\Pr(\mathbf{S})_{j=1,2} | \mathbf{T} > \Pr(\mathbf{S})_{j=0} | \mathbf{T}. \quad (2)$$

This assumes that the influence of test scores on the likelihood of admission to a selective institution depend on group membership—precisely the grounds on which affirmative action has been criticized. Therefore,

$$\Pr(\mathbf{S})_{ij} = \alpha + \beta_j \mathbf{M}_{ij} + \gamma \mathbf{T}_i + \delta_j \mathbf{M}_{ij} \mathbf{T}_i + \mathbf{X}_i + \varepsilon, \quad (3)$$

where δ_j represents the conditional probability that group “j” enrolls at a selective versus nonselective institution for a given SAT band.

Evidence that $\delta > 0$, or that β_1, β_2 or $\beta_3 > \beta_0$, is insufficient support for the “mismatch” hypothesis, which requires evidence of lower graduation rates relative to group members whose academic credentials are more congruent with their institutional peers. Critics of affirmative action argue that Hispanic and black students admitted using

race sensitive criteria are not well suited to the rigorous academic demands of selective institutions. Thus, the “mismatch” hypothesis predicts that Hispanic (and black) students are less likely to graduate from selective compared to nonselective institutions (Arkes, 1999).¹¹ That is,

$$\Pr(\text{Grad})_{j=1,2} | (\mathbf{S}=1) < \Pr(\text{Grad})_{j=1,2} | (\mathbf{S}=0). \quad (4)$$

Presumably, the lower expected graduation probability for minority students attending selective institutions reflects the incongruence between their standardized test scores and the institutional average. Thus, in the following specification,

$$\Pr(\text{Grad})_{ij} = \alpha + \beta_j \mathbf{M}_{ij} + \gamma \mathbf{S} + \lambda_j \mathbf{M}_{ij} \mathbf{S}_i + \mathbf{X}_i + \varepsilon, \quad (5)$$

the “mismatch” hypothesis can not be rejected when $\lambda < 0$.

It is important to distinguish between racial and ethnic graduation probabilities *within* institutions and the predictions of the “mismatch” hypothesis, which focus on same group comparisons *between* selective and nonselective institutions. Both sources of inequality are of policy interest, and both invoke vitriolic allegations from opponents of affirmative action. Our focus is on the latter, and speaks to the former only tangentially because we do not model institution-specific differences in graduation rates, which the “mismatch” hypothesis does not address.

Data and Empirical Modeling

Data: We analyze the College and Beyond (C&B) database using the 1989

¹¹ Bowen and Bok’s (1998) analysis of the “fit” hypothesis considered multiple outcomes, including college graduation, but the widened white-Hispanic disparities in college completion warrant emphasis on this outcome.

cohort who attended selective and highly selective institutions. However, because this dataset represents the experience of a relatively small share of students attending four-year selective institutions, and particularly Hispanics, we also analyze two nationally representative data sets—the High School and Beyond (HS&B) and the National Educational Longitudinal Survey (NELS:88). Comparing the experiences of C&B matriculants to national college-bound populations not only provides a broader perspective on the selection processes that allocate students to institutions of varying competitiveness, but also provides a reliability check on Bowen and Bok’s (1998) claims for blacks. This is especially important because the C&B institutional selectivity spectrum is truncated, which may limit the generalizability of influences.

The C&B database is a restricted-access database built by the Andrew W. Mellon Foundation between 1995 and 1997 (Bowen and Bok 1998: Appendix A). Two strengths of these data for analyzing graduation rates at selective colleges and universities are the accurate persistence data derived from college transcripts (rather than students’ self-reports) and the large samples of minority students attending selective institutions. The core of the C&B database is an “institutional data file” consisting of more than 90,000 records of undergraduate students who enrolled at one of 34 academically selective colleges and universities in the fall of 1951, 1976, and 1989. Because the Hispanic samples are small for the early cohort and because the debate over affirmative action gained momentum since the controversial *Bakke* decision, we focus on the 1989 entry

cohort at 28 of the C& B schools.¹²

The institutional file contains information drawn from students' applications and transcripts, including race, sex, SAT scores, college grade point average, major field of study, whether the student graduated and when. Institutional records were collected for all students who enrolled in the fall of 1989 at all but three of the C&B institutions.¹³ These individual student records are linked to several other sources including a survey that collected retrospective data, files provided by the College Entrance Examination Board (CEEB), and data collected by Higher Education Research Institute (HERI) at the University of California, Los Angeles. Limiting the analysis to U.S. residents/citizens with valid racial and ethnic identities and graduation status, the final sample of 29,018 students includes 23,086 whites, 2,260 blacks, 1,235 Hispanics, and 2,437 of Asian origin.

The HS&B and NELS:88 surveys are nationally representative samples of the 1982 and 1992 high school graduation cohorts, respectively. The detailed education histories provided by these longitudinal surveys make them ideal for studying both the transition to college and the selectivity of college matriculants. In addition to over-samples of blacks and Hispanics, these surveys also include rich information about test

¹² Six institutions were excluded from the analysis: four historically black colleges and universities and two universities (one public and one private), as these schools did not provide the detailed information needed to measure the timing of graduation.

¹³ At one institution a sample of approximately 2,000 matriculants was taken. All known under-represented minority students, all athletic letter winners, all students with combined SAT scores of 1350 or higher were selected, and a random sample of all other students. Sample weights equal to the inverse of the probability of being sampled are applied to achieve institutional representativeness.

scores and academic high school performance, as well as standard indicators of family background. Transcript data are available for students who attended college.

Our substantive interest dictates restricting both samples to white, black, Hispanic, and Asian students who attended a 4-year postsecondary institution with a valid institutional selectivity ranking. For the NELS survey, the analysis sample includes the 1992 high school graduation cohort respondents who were interviewed in the 2000 follow-up. Of the 4,530 eligible students, 3,326 are white, 386 black, 361 Hispanic, and 457 of Asian origin. The comparable HS&B analysis sample consists of 4,704 students who graduated from high school in 1982 and who were re-interviewed 10 years later. Eligible respondents include 3,260 whites, 644 blacks, 559 Hispanics, and 241 Asians. All analyses are weighted to adjust for over-sampling, non-response, and attrition. Appendix A provides detailed definitions and descriptive statistics of variables analyzed from each dataset.

Empirical Estimation: The multivariate analysis is designed to assess the effect of institutional selectivity on six-year graduation status (1 = yes, 0 = no) of white, black, Hispanic, and Asian students for all three surveys. That the majority of college students, and minority students in particular, do not attend selective post-secondary institutions warrants depiction of the sorting regime governing this allocation. Because the allocation of individuals to colleges and universities that differ in the selectivity of their admissions is endogenous to subsequent academic success, the likelihood of enrollment at selective institutions and the likelihood of graduation is estimated jointly. We used the procedure of Seemingly Unrelated Bivariate Probit to obtain unbiased and consistent estimates.

This technique estimates error covariances across equations while permitting different predictors between them (Pindyck and Rubinfeld, 1998; Greene, 2000). The estimated Rho coefficient indicates the extent of correlation among the errors.

As an added reliability check, we conduct a propensity score analysis by creating group-specific subsamples of students with similar propensities to attend selective and highly selective institutions (Rosenbaum and Rubin 1983). Following Hoffer (1992) and Betts and Shkolnik (2000)—who used this analytical strategy for a parallel problem of high school tracking—we stratify the race and ethnic groups into quartiles based on propensity scores and test for the effect on graduation of attending a selective school within each quartile. This important extension allows us to assess whether the alleged costs of attending a selective institution differs by students' ability and whether these purported costs increase as the disparity between students' and institutional test scores diverge, as insinuated by proponents of the mismatch hypothesis.

Results

Table 1 reveals the diversification of college campuses changed during the post-*Bakke* expansion of affirmative action. The relative share of white students attending selective institutions declined since the early 1980s, when the HS&B students began their postsecondary education. Asians witnessed the most substantial gains at selective institutions, nearly doubling their shares between 1982 and 1992. Despite the rapid growth of the Hispanic college-age population since 1980, and the aggressive recruitment of black and Hispanic students by admissions officers from selective colleges and universities, their shares of the entering cohort rose only slightly during the 1980s.

At the most competitive institutions included in the C&B sample, the combined representation of blacks and Hispanics reached 12.5 percent. Paralleling national trends, the diversification of the most elite institutions largely reflects the rising Asian presence. Cross-data comparisons reveal relatively similar shares of black students attending selective institutions, approximately 6 to 7 percent for NELS and C&B, respectively, but lower shares of Asian and Hispanic enrollees in selective institutions based on the C & B data compared to NELS. Most likely this reflects the exclusion of Texas and California public flagship institutions from the C&B database.

[Table 1 about here]

Although minority enrollment and graduation from selective post secondary institutions increased since 1980, racial and ethnic disparities in graduation rates persist. Six-year graduation rates are higher, on average, for selective compared to nonselective institutions, which undermines allegations that lowering admission thresholds to include more minority students lowers overall graduation rates. Table 2 refutes this claim by showing that black and Hispanic students increased their graduation rates between 1982 to 1992 at both selective and non-selective institutions. Specifically, the graduation rate of black students attending non-selective schools rose from 26 percent in 1982 to 48 percent in 1992, while black graduation rates at selective institutions rose 20 percentage points from 52 to 72 percent. The rise in Hispanic graduation rates during this period

were more modest, increasing from 26 to 40 percentage points at non-selective institutions compared with a rise of only 7 percentage points at the selective institutions.¹⁴

[Table 2 about here]

Graduation rates are uniformly higher for selective compared with nonselective institutions (see “ratio” column), although the graduation gap between selective and non-selective colleges and universities narrowed over time for all groups. White students’ 1982 graduation ratio of 1.5, which indicates those attending selective schools are 1.5 times more likely to graduate than their race counterparts attending non-selective institutions, declined modestly to 1.3 ten years later. For Hispanic students the graduation ratio between selective and nonselective institutions narrowed more substantially, falling from 2.4 to 1.7. That graduation rates are higher for the C&B schools than the selective schools included in NELS and HS&B samples is unsurprising given the positive association between institutional selectivity and graduation rates overall. However, these differences also highlight a limitation of the C&B data for testing the “mismatch” hypothesis because the truncated distribution of institutional selectivity greatly restricts variation in both student attributes and graduation rates.

Two findings are noteworthy for the “mismatch” hypothesis. First, Hispanic and black students’ graduation probabilities are higher at selective compared to nonselective institutions, contrary to the predictions of the “mismatch” hypothesis. In fact, the racial

¹⁴ That Asians’ graduation probability is lower in 1992 than in 1982 may reflect the greater heterogeneity of the Asian sample in 1992 compared with 1982. The earlier sample includes a higher share of South and East Asian youth, who are known to have very high rates of academic success. In addition, their high graduation rate in 1982 may be inflated due to the small sample size, which increases the error of the estimate.

and ethnic graduation gap narrows as institutional selectivity increases. Second, the graduation gap between selective and nonselective institutions is greater for blacks and Hispanics compared with whites in all datasets. Although these tabular results appear to challenge the “mismatch” hypothesis, this is not definitive evidence because students attending selective institutions are generally better prepared academically than their counterparts enrolled in nonselective institutions. Thus the higher minority graduation rates at selective institutions may simply reflect their higher average qualifications.

To assess the degree of mismatch between students and their post-secondary institutions, Table 3 reports the deviation of each group SAT and class rank mean from the institutional tier average.¹⁵ Because Hispanic students are more likely than either whites, blacks, or Asians to be first generation college-attendees, we also examine group deviations from institutional means for this crucial indicator of college success. The lower panel reports the corresponding tier averages to which group-specific means are compared.

[Table 3 About Here]

In both 1982 and 1992, average SAT scores for white and Asian students were slightly higher than the institutional tier average at both selective and nonselective institutions. In contrast, and in line with the claims of mismatch proponents, both black and Hispanic students enrolled in selective institutions averaged test scores well below the respective institutional tier average—162 and 112 points lower, respectively, for

¹⁵ For the C&B we report the percent in the top decile of their class because of the restricted variation on this item, in this data set.

black and Hispanic HS&B respondents, and 176 and 95 points lower, respectively, for NELS students. However, the deviation of the Hispanic (and black) mean SAT scores for the nonselective institutional average was greater still, about 115 points for Hispanic HS&B students, and 100 points for NELS students. Racial and ethnic disparities in class rank mirror those based on average SAT scores.

That black and Hispanic mean SAT scores lag behind institutional averages at *both* selective schools and nonselective institutions would appear to challenge the “mismatch” hypothesis. Presumably, group-specific disparities in test scores lower the odds that black and Hispanic students will graduate in six years, yet the tabular differences reveal more pronounced disparities among students attending non-selective schools compared with those attending selective institutions. The C&B results show similar patterns, indicating that Hispanic students are better matched than blacks, but less well than either whites and Asians, to their institutions' average academic level. Hispanic students' mean SAT score lags about 86 points behind the tier average at both selective and highly selective schools, but they are better matched to highly selective institutions based on class rank.

An equally if not more important disadvantage confronted by black and Hispanic students enrolled in selective institutions derives from their family background, most notably their parents' educational attainment. In both national samples the percentage of first generation of college goers exceeds their tier average by about 20 percentage points. A similar disparity obtains from C&B students attending selective institutions, but the gap rises to about 30 percentage points among students enrolled in C&B's highly

selective schools. That Hispanic and black students attending both selective and non-selective institutions appear to be less well prepared scholastically and to hail from families with low parental education has direct implications for their persistence in the postsecondary education system. Their different starting lines may be more consequential at selective institutions compared with non-selective schools, according to the “mismatch” hypothesis, because the academic curriculum is more demanding (Bowen and Bok 1998; Massey, et al. 2002; Alon 2003b).

Comparisons between academic preparedness of students attending selective and nonselective institutions highlight misunderstanding about the “mismatch” hypothesis. Although minority students are less well prepared academically, on average, than whites and Asians based on test scores and class rank, those enrolled in selective schools are better prepared than their same-race counterparts enrolled in non-selective institutions. The “mismatch” hypothesis is not about racial and ethnic differences in graduation *within* selectivity tiers, but rather about *same group* comparisons *across* institutions that differ in the selectivity of their admissions. Therefore, it is necessary to model the selection regime that assigns students to selective and nonselective institutions. To isolate the effect of students’ characteristics on access to selective schools from the likelihood of graduation, we use an estimation technique that portrays the allocation regime governing assignment to selective and nonselective institutions (or more versus less selective institutions in the C&B data) and separates these influences (reflected in correlated errors) from the circumstances that influence persistence and graduation.

Multivariate Analysis

Because the allocation of individuals to colleges and universities that differ in the selectivity of their admissions is endogenous to subsequent academic success, we model enrollment in selective institutions and the likelihood of graduation simultaneously. For each dataset we estimate a bivariate probit model of enrollment in selective versus nonselective institutions (highly selective in the C&B data) and graduation six years after initial matriculation. The graduation equation includes covariates that are known to shape college persistence and success: a dummy variable for attending a selective school, dummy variables for parental education and income, class rank, individual SAT scores (to isolate student qualifications from institutional selectivity), athlete status and sex.¹⁶ The enrollment equation excludes institutional selectivity and sex, but includes group-specific interaction terms with SAT to portray affirmative action admissions, dummy variables for public high school attendance, and home geographical region. We estimate both a pooled model that represents minority groups with dummy variables as well as group-specific models that permit direct comparisons between selective and nonselective institutions. For ease of interpretation, probit coefficients are reported in a statistical appendix (Appendix Table B); Table 4 reports marginal effects associated with the covariates of theoretical interest.¹⁷

The statistical estimates corroborate the descriptive findings regarding affirmative action and the changing racial and ethnic diversity of selective institutions. In 1992,

¹⁶ The NELS data does not include a measure for athlete status.

¹⁷ For a dummy variable the marginal effect represents the change in the probability associated with a discrete change in the variable from 0 to 1, holding other variables at their mean (Long, 1997).

black and Hispanic high school graduates were, respectively, 18 and 11 percent more likely to attend a selective school, but in 1982 they were, respectively, only 4 and 10 percent more likely to do so than their statistically similar white counterparts. Nationally, Asian students also share an admission/enrollment advantage over white students, but not at the C&B institutions. Minority enrollment advantages are pronounced at the most selective institutions represented at the C&B top tier colleges and universities, where affirmative action has been used to diversify student bodies. The likelihood that black and Hispanic students enrolled at the most highly selective colleges and universities in 1989 was .3 and .2 higher, respectively, than statistically similar whites. These differentials are all the more impressive because the average probability of attending such institutions is about 10 percent.

[Table 4 about here]

Group-specific interactions with individual SAT scores provide further information about the operation of race sensitive admissions in allocating students to selective and non-selective institutions. Scholastic aptitude scores increase white applicants' chances of enrollment at selective schools, and the SAT premium for access to competitive institutions is significantly higher for blacks in both 1982 and 1992, but only in 1982 for Hispanics students. There is no evidence that black and Hispanic students enjoy a significant enrollment advantage to the most competitive C&B institutions compared with statistically similar white applicants. However, Asian students who matriculated in 1989 enjoyed greater access to the most competitive institutions than statistically comparable whites. Parental socioeconomic status,

represented by their college education and income, also increases students' probability of attending a selective institution (Hearn 1984; 1991). That only the highest parental income category significantly influenced enrollment probability suggests that financial aid was successful in equalizing access to competitive institutions by removing financial barriers for needy students (Alon 2001; Alon 2003b; Manski and Wise 1983).

The graduation equation reveals that Hispanic students are significantly less likely than whites to graduate within 6 years. This result is consistent over time and across samples. On average, the graduation probability of Hispanic students who matriculated in 1982 and 1992 was 0.18 and 0.12, respectively, lower than their statistically similar white classmates. The ethnic graduation gap is smaller among C&B students, as Hispanic graduation probabilities are less than .05 below those of comparable whites. Similar results obtain for black students, except that in 1992 the race graduation gap does not reach statistical significance. However, attending a selective institution significantly increases black students' graduation probability—other characteristics equal.

The most substantial impact on the odds of graduation of institutional selectivity obtains for the HS&B sample. For the 1982 high school graduation cohort the marginal effects on the 6-year graduation probability of some income brackets are comparable to the effect of minority group status. Interestingly, parental education and income exert a more substantial effect on the six-year graduation probability than on the odds of enrollment at a selective institution. This reinforces Bowen and Bok's (1998) admonition that resources invested in attracting disadvantaged students should be matched with comparable investments to ensure that all admitted students realize their full potential.

Evidence that black and Hispanic students are less likely to graduate than their white counterparts is not a test of the “mismatch” hypothesis, which requires evidence that the probability of graduating from a selective institution is significantly less than zero; in that case, the “mismatch” hypothesis can not be rejected. Table 5 reports results from group-specific bivariate probit models of enrollment and graduation using specifications identical to those reported in Table 4. In the interest of parsimony, we only report the marginal effect of attending a selective institution (highly selective for the C&B data) on six year graduation status. In addition to the conventional statistical test for the null hypothesis $H_0: b = 0$, we perform statistical tests for $H_0: b \geq 0$ versus $H_1: b < 0$, required by our theoretical framework (Greene, 2000).

In both national data sets that portray the experience of students who began their college careers in 1982 and 1992, white and Asian students who attended a more selective school graduated at higher rates than their statistical counterparts who attended less selective institutions. The point estimates for Hispanic and black students do not reach statistical significance, indicating similar graduation probabilities at both selective and nonselective institutions. Moreover, the data is inconsistent with the hypothesis that blacks and Hispanics are less likely than whites to graduate from a selective institution.¹⁸ Thus, using national data, we reject the “mismatch” hypothesis.

[Table 5 about here]

¹⁸ For the one tailed test assessing $H_0: b \geq 0$ versus $H_1: b < 0$ we receive the following p-values for Hispanics: 0.79 and 0.76 for the HS&B and NELS, respectively. For blacks, the corresponding p-values are: 0.63 and 0.25, respectively.

However, the national sample of selective colleges and universities aggregates a wide range of institutions with highly diverse admission policies, academic rigor, and support mechanisms. To further test the “mismatch” hypothesis, we direct our focus to highly selective institutions not only because this is where race-sensitive admission policies are most controversial, but also because elite institutions are wealthier and have other resources to support the disadvantaged students they admit.¹⁹ In this respect, an examination of the difference between C&B students who attend elite schools and those attending less selective college and universities is very instructive. On average, Hispanic and black students (as well as whites and Asians) who attend C&B top tier schools (institutional mean SAT is 1320) are significantly *more likely* to graduate than their same-race counterparts attending less selective schools (institutional mean SAT is 1174). Specifically, attending an elite school increases Hispanic and black students’ graduation probability by approximately .11 and .10, respectively. Thus, the C&B findings further refute the “mismatch” hypothesis.²⁰ Moreover, these results suggest that affirmative action policies can ensure broader demographic representation among graduates of elite institutions, which is the rationale for race sensitive admissions.

¹⁹ Based on U.S. News and World Report, the highest ranking institutions have the lowest student/faculty ratio. For example, at the top ranking schools the student/Faculty ratio is 6/1, 8/1, and 7/1 at Princeton, Harvard, and Yale, respectively. At the five selective schools tied for the 47th ranking, the ratio is 12/1, 17/1, 17/1, 19/1, and 11/1 for Pepperdine University, Rensselaer Polytechnic Institute, University of California at Santa Barbara, University of Texas at Austin, and University of Washington, respectively. These factors contribute to the ranking formula (U.S. News and World Report, 2003).

²⁰ For the one tailed test assessing $H_0: b \geq 0$ versus $H_1: b < 0$ we derive the following p-values for Hispanics and blacks: 0.97 and 0.99, respectively. Performing a one tailed-test in the opposite direction reveals that the point estimate of attending a selective school is significantly larger than zero, i.e. for minority students attending a more selective school significantly *increases* graduation likelihood.

Our findings from three different datasets provide a robust assessment of the costs/benefits associated with attending selective institutions, conditional on admission and enrollment. However, proponents of the mismatch hypothesis may argue that mean differences conceal more than they reveal and that the likelihood of failure rises as the disparity between student and institutional characteristics increases. To unpack the average effect produced by the bivariate probit models, we use propensity score analysis to stratify students into more homogeneous subsamples based on family background and scholastic achievement. Accordingly, students from similar strata should exhibit more similar propensities to attend selective institutions. We then gauge the effect of attending a selective/highly selective college on the likelihood of graduation within 6 years for student allocated to relatively homogeneous SES groups. Because a test of the mismatch hypothesis requires comparing graduation *within* race/ethnicity groups and because variable admission regimes govern the enrollment to top tier schools, all calculations (propensity and graduation) are group-specific.

Table 6 reports the group-specific marginal effects of attending a selective/highly selective institution on the 6-year graduation probability within propensity quartiles. Since very few students with the lowest propensity score actually attend top tier institutions, we report these effects for the three top propensity quartiles and only when sample sizes were adequate for reliable statistical comparisons. Results from all three datasets confirm the prior findings not only by showing that white students who attend selective institutions enjoy significantly higher graduation probabilities, but also by illustrating that the benefits increase for the more advantaged strata. That is, the higher

are students' initial propensities to attend top tier institutions, the greater their likelihood of succeeding academically and graduating in six years. Contrary to the premises of the mismatch hypothesis, the marginal graduation probability among the lower propensity quartiles is still *positive*, although of smaller magnitude and lower statistical significance compared with students represented in the highest quartile.

[Table 6 About Here]

Although results for minority groups defy a neat monotonic pattern (conceivably because of smaller sample sizes for minorities), they clearly illustrate the graduation benefits of attending a top tier institution. For example, considering minority students in the highest (group-specific) propensity quartile in 1992 (NELS), we find that attending a selective institution increases their likelihood of graduation by approximately .34 relative to students enrolled in less selective institutions. Hispanic students in the top two propensity quartiles seem to take advantage of the learning opportunity and resources available at top tier institutions, although the results do not always reach statistical significance.²¹

Discussion

In this analysis we sought to test claims that considering Hispanic origin and race in admissions decisions predestined “affirmative admits” for inevitable failure. Our findings established that minority students thrive in selective schools despite their

²¹ We caution against comparing *across* groups because by construction, group-specific propensity quartiles permit only *within* group comparisons. In other words, blacks and Hispanics in the top propensity quartile may represent different levels of mismatch from the institutional strata.

disadvantaged starting lines. Specifically, the likelihood of graduation appears to increase as the competitiveness of the institution attended rises. These findings should not come as surprise to the reader, as both common knowledge and empirical research demonstrate that students will learn more if they have greater opportunities for learning and that cognitive skill development is affected by *where* one is in school (Gamoran 1987). Research on elementary and secondary school levels shows that, net of initial differences, students who attend higher tracks/better schools attain higher scholastic success (Gamoran 1987; Gamoran and Berends 1987; Hallinan 1996; Entwisle et. al. 1997).

Bowen and Bok could not directly observe *why* graduation rates of black students were higher among those attending more compared to less selective institutions, but they speculated about plausible reasons. They proposed three, including (1) the fine-tuned admission process at the most competitive institutions, which seeks to identify students with very high probabilities of success; (2) large institutional endowments and resources that allow for small class sizes and facilitate strong mentoring at the most competitive schools; and (3) unobserved individual differences in drive and motivation to succeed.

Of these three reasons, institutional differences in resources that create diverse learning opportunities and facilitate persistence and timely graduation lend themselves to a straightforward investigation. To that end we focus on the C&B database that contains detailed information about financial aid and mentoring. Financial aid information included in the HERI file is derived from a questionnaire administered to college freshman as part of the Cooperative Institutional Research Program. The HERI questionnaire asked students about the sources and amounts of financial aid they received

for college. Nineteen possible aid sources were listed, which we allocated among three main categories: grants, loans, and work-study support.²² To assess other institutional support we draw on information from the C&B survey.²³ The measure used in the current analysis is a simple count of persons with whom students sustained meaningful contact.

Table 7 reports the share of students who received aid, and for those who did, it summarizes the mean dollar amounts received from each source. Fifty three percent of student attending highly selective institutions received grants compared to 45 percent of student attending less selective schools. Students attending the most elite schools also collected larger sums of grant dollars, averaging \$3,700 – a figure that exceeds grants claimed by students in less selective schools by about \$700. Not only were students attending more selective schools more likely than students attending less selective institutions to participate in work-study programs and to receive loans to cover college expenses, but they also collected larger sums from these sources. Finally, students who

²² *Grants* included Pell Grant, Supplemental Educational Opportunity Grant, state scholarship or grant, other college grant or scholarship, other private grant, and other government aid (ROTC, BIA, GI, etc.); *loans* included Federal Guaranteed Student Loan, National Direct Student Loan, other college loan, and other loan; *work-study* included college work-study grant, part-time job on campus, other part-time job while in college, full-time job while in college. Sensitivity analysis, which assessed the justification of including work-study grant with other type of work, showed that similar results were obtained when replacing this “\$ from work” construct with work-study aid only, excluding other types of work while in college. These three aid categories—grants, loans, and work-study—are considered external aid resources. All other resources are classified as a residual of independent resources—aid from parents or spouse, savings from summer work, other savings, and other aid—and are not included in the analysis. We distinguish between whether aid was received and the amounts received. Amounts ranged from zero to over \$18,000 for each financial aid type. See Alon (2003c) for details.

²³ The students were asked, “While you were an undergraduate, did anyone associated with your school, other than fellow students, take a special interest in your work—that is, was there someone you could turn to for advice or for general support or encouragement?” If the respondent answered “Yes,” he/she was asked, “Who was that? A faculty member, teaching assistant, resident advisor, college dean or other administrator, athletic coach, alumnus, or other?”

attended the more selective schools also benefited from stronger mentoring, as they were more likely than their counterparts attending less competitive institutions to find a faculty or a staff member they could turn to for advice or for general support or encouragement while in college.

[Table 7 About Here]

These institutional differences in both the quantity and quality of support resources available to students reveal some of the mechanisms that enable students who attend the most academically and financially demanding institutions in the country to persist and graduate within six years of matriculation. Support mechanisms are especially important for students hailing from socioeconomically and academically disadvantaged backgrounds, particularly first generation college goers, among whom Hispanic and black students are disproportionately represented. Alon (2003c) directly links financial aid to college graduation by showing that financial aid, and grants in particular, is an important factor in equalizing black and Hispanic minority students' college success with that of their white and Asian counterparts.

Nevertheless, our results do not speak to the persistent racial and ethnic graduation gap within selectivity tiers. Given the immense efforts and ample resources devoted to attracting and recruiting under-represented minorities to the most selective colleges and universities, evidence that nontrivial shares of blacks and Hispanic students leave these institutions without a college diploma is disconcerting. Even more disturbing are race and ethnic differences in graduation rates among students of comparable

academic ability and socioeconomic background, (Bowen and Bok 1998; Small and Winship 2002; Vars and Bowen 1998).

Racial and ethnic gaps in college graduation rates are of major concern not only because education serves as a gateway to personal financial success and social standing (Hoxby 2001), but also because of the shadow that graduation disparities casts on race-sensitive admission practices. For these reasons, further research must continue to explore reasons for minority students' underperformance in both selective and nonselective institutions. Differential participation in college athletics is one plausible reason, but there are many others. Striving to increase college access while narrowing graduation gaps is all the more urgent in light of the changing demographic contours and the dire need to curtail the ethno-racial divide in life chances. In that respect, our results suggest that applying race-sensitive admission criteria aid in achieving this societal goal. Our findings also show that investing institutional resources toward goals that promote college success help minority youth realize their potential.

Table 1
Racial and Ethnic Composition of Post-secondary Institutions by Admission Selectivity Tier and Entry Cohort

	HS & B 1982		NELS 1992		C & B 1989	
	Non-selective	Selective	Non-selective	Selective	Selective	Highly Selective
White	82.5	85.4	79.4	78.2	83.2	75.9
Black	11.4	5.3	10.3	6.2	6.9	7.3
Hispanic	4.4	4.4	6.2	6.0	3.3	5.2
Asian	1.7	4.9	4.1	9.6	6.7	11.7
Total	83.2	16.8	72.2	27.9	71.7	28.3
N	3831	854	3105	1341	19804	9214

Table 2
Graduation Probabilities by Race, Institutional Selectivity Tier and Entry Cohort

	HS & B 1982			NELS 1992			C & B 1989		
	Non-selective (1)	Selective (2)	Ratio (2)/(1)	Non-selective (1)	Selective (2)	Ratio (2)/(1)	Selective (1)	Highly selective (2)	Ratio (2)/(1)
White	53.4	82.0	1.5	62.5	81.2	1.3	86.1	93.4	1.1
Black	26.4	51.6	2.0	47.6	71.7	1.5	72.3	84.4	1.2
Hispanic	25.7	62.1	2.4	40.5	69.0	1.7	79.3	91.2	1.2
Asian	50.9	90.9	1.8	53.6	82.9	1.5	87.8	96.1	1.1
Average	49.0	80.0	1.6	59.3	80.0	1.3	85.0	93.4	1.1
N	3831	854		3105	1341		19804	9214	

Table 3
The Mismatch Regime: Deviations from Mean Institutional Scholastic Achievement and Parental Education
by Selectivity Tier, Entry Cohort and Race

	HS & B		NELS		C & B	
	1982		1992		1989	
	Tier		Tier		Tier	
Deviations from Tier Means:	Non-selective	Selective	Non-selective	Selective	Selective	Highly-selective
White						
Class rank mean	1.5	0.1	1.0	-0.4	2.4 ^a	1.3 ^a
SAT mean	21.8	10.0	21.8	13.5	13.8	13.4
% 1st generation college	-1.3	-2.4	-3.4	-2.5	-1.7	0.0
N	2668	578	2345	929	16091	6995
Black						
Class rank mean Deviation	-9.5	-7.0	-6.9	-3.2	-24.6 ^a	-21.9 ^a
SAT mean Deviation	-180.0	-162.3	-155.1	-176.0	-172.1	-156.9
% 1st generation college	19.4	32.2	17.6	13.0	22.0	22.4
N	547	95	287	85	1592	668
Hispanic						
Class rank mean Deviation	-10.6	-3.1	-0.1	1.5	-13.5 ^a	-2.6 ^a
SAT mean Deviation	-115.2	-112.0	-100.1	-95.1	-86.6	-85.2
% 1st generation college	19.8	18.8	23.4	17.8	18.8	30.9
N	466	91	267	82	758	477
Asian						
Class rank mean Deviation	9.1	9.3	-5.7	4.5	1.5 ^a	6.8 ^a
SAT mean Deviation	7.4	37.0	-19.3	32.6	45.7	46.8
% 1st generation college	-2.2	-8.0	-9.4	5.9	-11.1	-3.8
N	150	90	206	245	1363	1074
Tier SAT mean	930.7	1112.6	912.7	1090.2	1174.3	1320.5
(s.d.)	(182.2)	(179.3)	(176.7)	(172.0)	(148.4)	(122.0)
Tier class rank mean	64.6	78.5	67.4	81.4	62.4	81.6
(s.d.)	(25.47)	(19.81)	(23.09)	(18.32)		
Tier % 1st generation college	61.4	35.9	56.2	29.5	44.6	30.4

Notes:

^a For C&B data, classrank represents percent ranked in top decile.
The number reported is the deviation from the corresponding tier average percentage in HS top ten percent.

Table 4
Bivariate Probit Marginal Effects on Enrollment in Selective Institutions and
6-Year Graduation Status

Covariates ^a	HS&B, 1982		NELS, 1992		C&B, 1989	
	Enroll in Selective Institution	Graduate in 6 years	Enroll in Selective Institution	Graduate in 6 years	Enroll in Highly Selective Institution	Graduate in 6 years
Black	0.04 ^a	-0.16 **	0.18 **	-0.04	0.31 **	-0.09 **
Hispanic	0.10 **	-0.18 **	0.11 *	-0.12 **	0.20 **	-0.04 **
Asian	0.15 **	-0.03	0.16 **	0.00	0.01	0.02 *
Selective Institution		0.44 **		0.20 *		0.09 **
Parents B.A.	0.05 **	0.10 **	0.08 **	0.04	0.01	0.03 **
Parents Adv. Degree	0.08 **	0.12 **	0.15 **	0.08 *	0.02 **	0.02 **
Inc2	-0.02	0.06	0.03	0.11 **	-0.02 **	0.03 **
Inc3	0.00	0.07 [†]	-0.03	0.10 *	-0.02 **	0.05 **
Inc4	-0.03	0.12 **	-0.04	0.12 **	-0.01	0.05 **
Inc5	-0.01	0.12 **	0.01	0.17 **	0.00	0.06 **
Inc6	0.07 **	0.04	0.11 *	0.18 **	0.03 **	0.06 **
Class rank	0.00 **	0.01 **	0.00 **	0.01 **	0.06 **	0.04 **
SAT (centered)	0.04 **	0.02 **	0.08 **	0.01 *	0.09 **	0.00
B*SAT	0.01 **		0.02 *		0.00	
H*SAT	0.01 **		0.01		-0.01 *	
A*SAT	0.00		0.00		0.02 **	
Athlete	0.02	0.09 **			0.19 **	0.03 **
Female		0.00		0.07 **		0.02 **
Public H.S.	-0.08 **		-0.06 [†]		0.01 *	
South	-0.15 **		-0.05 [†]		0.06 **	
Midwest	-0.09 **		-0.04		-0.07 **	
West	-0.06 **		0.05		0.14 **	
Predicted Probability	0.11	0.55	0.24	0.67	0.10	0.89
rho	-0.48 **		-0.16		-0.14 **	
Observations	4685	4685	4446	4446	29018	29018

* P ≤ .05; ** P ≤ .01; † P ≤ .10

[Notes: ^aSee Appendix Table A for detailed variable descriptions]

Table 5
Group-Specific Marginal Effects of Attending a Selective Institution on
6-Year Graduation Status^a

Group-Specific Model	HSB 1982	NELS 1992	CB 1989
White	0.41 **	0.25 **	0.08 **
Black	0.11	-0.19	0.10 **
Hispanic	0.22	0.21	0.11 *
Asian	0.62 **	0.50 **	0.11 **
N	4685	4446	29018

* $P \leq .05$; ** $P \leq .01$; † $P \leq .10$ (two-tailed: null hypothesis $b = 0$)

^a Based on group-specific bivariate probit of enrollment and 6-year graduation status

Table 6

Group Specific Marginal Effect of Attending a Selective Institution on 6-Year Graduation Status, By Propensity Quartiles^a

	HSB 1982			NELS 1992			C&B 1989		
(Group-Specific)	propensity quartile			propensity quartile			propensity quartile		
Model	2	3	4	2	3	4	2	3	4
White	0.05	0.17 **	0.23 **	0.08	0.09 †	0.08 *	0.03 *	0.04 **	0.05 **
Black	^b	0.08	0.22 †		-0.10	0.34 **	0.13 †	0.04	-0.01
Hispanic		0.24	0.11		0.52 **	0.33 **	0.07	0.09 **	0.05
Asian		0.56 **	0.03	0.10	0.40 **	0.34 **	0.07 **	0.00	0.03

* $P \leq .05$; ** $P \leq .01$; † $P \leq .10$ (two-tailed)

^a We do not report results for the lowest propensity quartile because very few students in this quartile attended a selective/highly selective institution.

^b Empty cells are due to small sample sizes

Table 7
Support Mechanisms Available at Selective and Highly Selective
Institutions, C&B Schools
(means or percents)

	C & B 1989	
	Selective	Highly Selective
<i>Financial Aid</i>		
Grants		
% Received Grants	45.1	53.4
\$ Grants Receipt (Std. Dev.)	3011.13 (2114.44)	3692.59 ^a (2193.91)
Work		
% Received Work-Study	32.2	45.4
\$ Work Employment (Std. Dev.)	1239.54 (991.29)	1301.65 ^a (938.02)
Loans		
% Received Loans	30.6	38.3
\$ Loans Receipt (Std. Dev.)	2385.07 (1393.53)	2798.30 ^a (1498.90)
N	10733	4463
Source: HERI data		

Academic and Social Support

Mentoring		
% With Mentors	48.6	50.4
# mentors mentor > 0 (Std. Dev.)	1.71 (0.95)	1.82 ^a (0.98)
N	5062	4284
Source: C&B Survey data		

a) Difference b/w selective and highly selective institutions is significant at 1%;

**Table Appendix A:
Descriptive Statistics of the Sample, HS&B, NELS:88 and C&B Students**

Data and Entry Cohort		HS & B	NELS	C & B	HS & B		NELS		C & B	
					1982		1992		1989	
Variable	definition				Mean	(Std. Dev.)	Mean	(Std. Dev.)	Mean	(Std. Dev.)
Grad6	6-year graduation rate				0.54		0.65		0.87	
White	White, not of Hispanic origin				0.83		0.79		0.81	
Black	Black, not of Hispanic origin				0.10		0.09		0.07	
Hisp	Hispanic, regardless of race				0.04		0.06		0.04	
Asian	Asian or Pacific Islander				0.02		0.06		0.08	
Selective	Inst. Mean SAT	1112.6	1090.171	1320.52	0.17		0.28		0.28	
Pared_ba	At least one parent with a BA degree				0.19		0.22		0.09	
Pared_adv	At least one parent with an advanced degree				0.23		0.25		0.47	
Inc2	Parental Income, grouped	15-20k	15-25k	20-39k	0.10		0.10		0.19	
Inc3	Parental Income, grouped	21-25k	25-34k	40-59k	0.11		0.11		0.19	
Inc4	Parental Income, grouped	26-30k	35-49k	60-79k	0.13		0.20		0.08	
Inc5	Parental Income, grouped	31-40k	50-74k	80-99k	0.18		0.24		0.31	
Inc6	Parental Income, grouped	40+k	75+k	100+k	0.25		0.23		0.18	
Class rank	HS class rank	1-100	1-100	in Top 10%	50.01	(36.20)	55.19	(35.79)	0.55	
SAT	SAT score				960.47	(193.83)	963.25	(192.81)	1217.03	(156.07)
Athlete	Whether the student was an athlete	N/A			0.12				0.12	
Female	Female=1, Male=0				0.53		0.55		0.51	
Public	Attended a Public HS				0.83		0.75		0.44	
South	Home Region				0.29		0.31		0.26	
Midwest	Home Region				0.30		0.27		0.23	
West	Home Region				0.14		0.15		0.08	
Grants Receipt	Received Grants 1=Yes, 0=No								0.47	
Grant Amount	Amounts in \$								3220.68	(2162.04)
Work-Study Receipt	Received Work-Study/Worked 1=Yes, 0=No								0.36	
Work-Study Amount	Amounts in \$								1261.04	(973.55)
Loan Receipt	Received Loans 1=Yes, 0=No								0.33	
Loan Amount	Amounts in \$								2516.92	(1440.79)
Mentor	A count of people with whom the student had meaningful contact while in college								0.25	(0.71)
Observations					4685		4446		29018	

Table Appendix B:
Bivariate Probit Estimates of Enrollment in Selective Institutions and
6-Year Graduation Status
(Asymptotic standard errors)

	HS&B		NELS		C&B	
	Selective	Grad6	Selective	Grad6	Selective	Grad6
Black	0.206 (0.118)	-0.395** (0.084)	0.519** (0.150)	-0.096 (0.118)	1.093** (0.046)	-0.369** (0.036)
Hispanic	0.440** (0.149)	-0.464** (0.092)	0.333* (0.162)	-0.326** (0.103)	0.765** (0.049)	-0.179** (0.047)
Asian	0.586** (0.123)	-0.069 (0.119)	0.465** (0.136)	-0.010 (0.136)	0.052 (0.061)	0.086* (0.042)
Selective institution		1.352** (0.144)		0.589* (0.301)		0.515** (0.048)
Parents, B.A.	0.259** (0.085)	0.259** (0.074)	0.242** (0.078)	0.102 (0.077)	0.047 (0.038)	0.179** (0.040)
Parents, adv. degree	0.375** (0.085)	0.303** (0.075)	0.451** (0.087)	0.214* (0.098)	0.093** (0.024)	0.078** (0.026)
Inc2	-0.104 (0.126)	0.160 (0.111)	0.081 (0.140)	0.336* (0.136)	-0.125* (0.051)	0.151** (0.045)
Inc3	0.002 (0.128)	0.186 (0.106)	-0.091 (0.147)	0.278* (0.134)	-0.151** (0.052)	0.309** (0.047)
Inc4	-0.158 (0.116)	0.317** (0.104)	-0.145 (0.136)	0.349** (0.126)	-0.042 (0.058)	0.292** (0.058)
Inc5	-0.029 (0.102)	0.299** (0.099)	0.036 (0.136)	0.489** (0.124)	-0.029 (0.050)	0.334** (0.047)
Inc6	0.355** (0.092)	0.099 (0.099)	0.335* (0.136)	0.534** (0.142)	0.153** (0.054)	0.384** (0.055)
Class rank	0.011** (0.002)	0.014** (0.001)	0.010** (0.002)	0.014** (0.002)	0.380** (0.023)	0.216** (0.026)
SAT (centered)	0.209** (0.022)	0.038** (0.006)	0.250** (0.022)	0.024* (0.010)	0.786** (0.030)	0.154** (0.034)
Athlete	0.090 (0.090)	0.234** (0.078)			0.507** (0.010)	0.007 (0.006)
Female		-0.013 (0.052)		0.187** (0.057)		0.123** (0.022)
B*SAT	0.065** (0.023)		0.068* (0.028)		-0.014 (0.017)	
H*SAT	0.069* (0.028)		0.021 (0.027)		-0.044 (0.022)	
A*SAT	-0.021 (0.025)		0.006 (0.022)		0.096** (0.034)	
Public H.S.	-0.361** (0.070)		-0.192* (0.082)		0.051* (0.022)	
South	-0.984** (0.096)		-0.162 (0.086)		0.316** (0.025)	
Midwest	-0.534** (0.076)		-0.137 (0.082)		-0.470** (0.029)	
West	-0.376** (0.095)		0.153 (0.120)		0.601** (0.033)	
Constant	-2.087** (0.160)	-1.306** (0.120)	-1.585** (0.199)	-1.192** (0.157)	-1.099** (0.053)	0.489** (0.047)
Rho	-0.48 **		-0.16		-0.14 **	
Observations	4685		4446		29018	

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

References

- Ahituv, Avner and Marta Tienda. forthcoming. "Employment Activity and School Continuation Decisions of Young Women." *Journal of Labor Economics*.
- Alon, Sigal. 2001. "Racial, Ethnic and Socioeconomic Disparities in College Destinations, 1982 and 1992." Office of Population Research Working Paper No. 2001-02.
- , 2003a. "Race and Class Intersectionality in the Access to College Destination: The influence of Race- and Need-sensitive Policies." Unpublished manuscript.
- , 2003b. "Overlapping Disadvantages and Racial and Ethnic Disparities in College Graduation." Unpublished manuscript.
- , 2003c. "Financial Support and Ethnic Disparities in College Graduation." Unpublished manuscript.
- Arkes, Hal R. 1999. "Review: The Shape of the River: Long-Term Consequences of Considering Race in College and University Admissions." *Liberty*, 83, 51-56. Online: <http://www.libertysoft.com/liberty/reviews/71arkes.html> (Accessed 30 July 2003).
- Barron's, 2003. *Profiles of American Colleges*, 25th Edition. Hauppauge, New York: Barron's Educational Series.
- Bean, Frank D. and Marta Tienda. 1987. *The Hispanic Population of the United States*. New York: Russell Sage.
- Betts Julian R. and Jamie L. Shkolnik. 2000. "The Effect of Ability Grouping on Student Achievement and Resources Allocation in Secondary Schools." *Economics of Education Review*, 19:1-15.
- Bowen, William G. and Derek Bok. 1998. *The Shape of the River: Long-Term Consequences of Considering Race in College and University Admissions*. Princeton, N.J.: Princeton University Press.
- Bureau of Labor Statistics (BLS). 2001. "College Enrollment of Last Year's High School Graduates." Online: <http://www.bls.gov/opub/ted/2001/apr/wk3/art01.htm> (Accessed 30 July 2003).
- Crawford, Curtis. 2000. "Weighing the Benefits and Costs of Racial Preference in College Admissions review of: The shape of the River: Long-Term Consequences

- of Considering race in College and University Admissions.” *Society*, 37 (4), 71-80. Online: <http://www.ceousa.org/crawford.html> (Accessed 1 August 2003).
- Danziger, Sheldon and Gottschalk, Peter (eds.). 1993. *Uneven Tides: Rising Inequality in America*. New York: Russell Sage.
- Davies, Scott and Neil Guppy. 1997. “Fields of Study, College Selectivity, and Student Inequalities.” *Social Forces*, 73 (4), 131-151.
- Dworkin, Ronald. 1998 (October 22). “Affirming Affirmative Action Review.” *The New York Review of Books*.
- Entwisle, Doris R., Karl L. Alexander, and Linda S. Olson. 1997. *Children, Schools and Inequality*. Westview Press
- Fry, Richard. 2002. “Latinos in Higher Education: Many Enroll, Too Few Graduate.” Research Report. Washington, D.C.: Pew Hispanic Center. Online: <http://www.pewhispanic.org/site/docs/pdf/latinosinhighereducation-sept5-02.pdf> (Accessed 1 August 2003).
- , 2003. “Hispanic Youth Dropping Out of U.S. Schools: Measuring the Challenge.” Research Report. Washington, D.C.: Pew Hispanic Center. Online: <http://www.pewhispanic.org/site/docs/pdf/high%20school%20dropout%20report-final.pdf> (Accessed 1 August 2003).
- Gamoran, Adam. 1987. "The Stratification of High School Learning Opportunities." *Sociology of Education*, 60:135-155.
- Gamoran, Adam and Mark Berends. 1987. "The Effect of Stratification in Secondary Schools: Synthesis of Survey and Ethnographic Research." *Review of Educational Research*, 57:415-435.
- Gamoran Adam and Robert Mare. 1989. "Secondary School Tracking and Educational Inequality: Compensation, Reinforcement, or Neutrality?" *American Journal of Sociology*, 94:1146-83
- Graglia, Lino A. 1993. “Racial Preferences in Admission to Institutions of Higher Education.” In Howard Dickman, ed., *The Imperiled Academy*. New Brunswick, NJ: Transaction Publishers.
- Greenberg, Jack. 2002. “Affirmative Action in Higher Education: Confronting the Condition and Theory.” *Boston College Law Review*, 43, 521-621.

- Greene, William H. 2000. *Econometric Analysis*, 4th ed. Upper Saddle River, NJ: Prentice-Hall.
- Hallinan, Maureen T. 1996. "Track Mobility in Secondary School." *Social Forces*, 74 (3):983-1002.
- Hearn, James C. 1984. "The Relative Roles of Academic, Ascribed, and Socioeconomic Characteristics in College Destination." *Sociology of Education*, 57, 22-30.
- Hearn, James C. 1991. "Academic and Non-Academic Influence on the College Destinations of 1980 High School Graduates." *Sociology of Education*, 64, 158-171.
- Hoffer, Thomas. 1992. "Middle School Ability Grouping and Student Achievement in Science and Mathematics." *Education Evaluation and Policy Analysis*, 14:205-227.
- Hoxby, Caroline M. 2001. "The Return to Attending a More Selective College: 1960 to the Present." In Maureen Devlin and Joel Meyerson (eds.), *Forum Futures: Exploring the Future of Higher Education, 2000 Papers*, 3: 13-42.
- Kane, Thomas J. 1998. "Misconceptions in the Debate Over Affirmative Action in College Admissions." In Gary Orfield and Edward Miller, (ed), *Chilling Admissions: The Affirmative Crisis and the Search for Alternatives*. Cambridge: Harvard Education Publishing Group. 17-32
- Karen, David. 2002. "Changes in Access to Higher Education on the United States: 1980-1992" *Sociology of Education*, 75: 191-210.
- Lerner, Robert and Althea K. Nagai. 2001. "Pervasive Preferences: Racial and Ethnic Discrimination in Undergraduate Admissions across the Nation." Center for Equal Opportunity. <http://www.ceousa.org/multi.html> (Accessed September 19, 2003).
- Long, J. S. (1997). *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks, CA: Sage Publications, Inc.
- Manski, Charles F. and David A. Wise. 1983. *College Choice in America*. Cambridge, MA: Harvard University Press.

- Massey, Douglas S., Camille Z. Charles, Garvey Lundy and Mary J. Fischer. 2003. *Source of the River: The Social Origin of Freshmen at America's Selective Colleges and Universities*. Princeton NJ: Princeton University Press.
- McDonough, Patricia M. 1994. "Buying and Selling Higher Education: The Social Construction of the College Applicant." *The Journal of Higher Education*, 65 (4): 427-446.
- Pell, Terrance J. 2003. "Racial Preferences and Formal Equality." *Journal of Social Philosophy*, 342, 309-325.
- Pindyck, Robert S. and Daniel L. Rubinfeld. 1998. *Econometric Models and Economic Forecasts* (4th ed.). Boston: Irwin/McGraw-Hill.
- Rosenbaum, Paul R. and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Casual Effect." *Biometrika*, 70(1):41-55.
- Small, Mario Luis and Christopher Winship. 2002. "Better Environments or Better Students? Why Black Graduation Rates Vary Across Elite Colleges and Universities." *Working Paper presented at Mellon Foundation Diversity in Higher Education Conference*.
- Sowell, Thomas. 2003 (February 8). "Damaging Admissions: Increasing Faculty Diversity," *Capitalism Magazine*. Online: <http://www.capmag.com/article.asp?ID=2448> (Accessed 31 July 2003).
- Thernstrom Stephan, & Thernstrom, Abigail. 1999. "Reflections on The Shape of the River Book Review." *UCLA Law Review*, 46, 1583-1631.
- Tienda, Marta and Susan Simonelli. 2001. "Hispanic Students are Missing from Diversity Debates." *The Chronicle Review, The Chronicle of Higher Education*, section 2, June 1, B13-14.
- U.S. Department of Education, National Center for Education Statistics (NCES). 2003. "Status and Trends in the Education of Hispanics," (NCES 2003-008), by Charmaine Llagas. Project Officer: Thomas D. Snyder. Washington, DC.
- U.S News and World Report. 2003. Best Colleges. <http://www.usnews.com/usnews/edu/college/rankings/rankindex.htm> (Accessed: 24 June 2003)
- Vars, Fredrick E. and William G. Bowen. 1998. "Scholastic Aptitude Test Scores, Race, and Academic Performance in Selective Colleges and Universities." In

Christopher Jencks and Meredith Phillips (eds.), *The Black-White Test Score Gap*. Washington, D.C.: Brookings Institution Press. 457-479.