

**Where College-Bound Texas Students
Send Their SAT and ACT Scores: Does Race Matter?**

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Abstract

Although extensive research has been conducted on estimating college enrollment demand and even admission decisions, I have identified only one study (Toutkoushian, 2001) that examines the full college choice set at its beginning stage, prior to admission. Because graduating from selective colleges and universities improves the wages and opportunities for students of all races (Bowen and Bok 1998), encouraging college-bound minorities to send their standardized test scores to selective institutions is a laudable policy goal. Allowing well-prepared minorities to shortchange themselves at the earliest stages of the college choice process serves neither them nor society at large.

Using the Texas Schools Microdata Panel (TSMP), housed at The University of Texas at Dallas, I examine where college-bound Texas students sent their SAT and ACT scores in 1998 to analyze their revealed preferences for higher education. After controlling for standardized test scores, income and other background characteristics, and limiting the analysis to Texas public colleges and universities, I find that Texas college-bound minorities perceive their opportunities for post-secondary education to be different from whites. Results from a multinomial logit regression model indicate that being black, relative to white, reduces the probability of sending SAT or ACT scores only to selective Texas public colleges and universities by 6.2 percentage points. Being Hispanic reduces the probability by 2.6 percentage points. Furthermore, being black increases the probability of considering only non-selective schools by 8.1 percentage points.

Restricting the analysis to SAT-takers allows identification of private institutions as well as out-of-state schools, and although selectivity still matters, whether the school is located inside or outside of Texas becomes extremely important. Results from a similar multinomial logit model reveal that although blacks and Hispanics are still less likely than whites to send their scores to selective Texas institutions, they are *more* likely to send their scores to selective institutions out-of-state. Although the reasons why are currently unclear, a likely suspect is the *Hopwood vs. Texas* decision, a court ruling effectively ending affirmative action initiatives in the admissions decisions of all Texas public colleges and universities. Future research will examine that possibility.

1. Introduction

Minority access to higher education is receiving increased attention among college officials and policymakers, especially in light of recent court decisions banning affirmative action policies in admissions decisions. As college enrollments swell (Shea and Marcus 2001), the debate over who deserves admission becomes more intense as competition for a limited number of slots increases. It is possible that the aspirations of college-bound minorities suffer as racial and ethnic diversity at colleges with selective enrollment is increasingly called into question. But even ignoring changes in affirmative action policies, understanding how college-bound minorities determine their postsecondary choices is worthwhile. Do minorities, *ceteris paribus*, perceive their opportunities to be different from whites and select their college choice sets accordingly? If minorities constrain their choice sets from the earliest stages of the process, policy-makers need to address that inequity. In a report to the Texas State Legislature, for example, the Texas Higher Education Coordinating Board advocates the importance of addressing diversity. Demographers estimate that by 2010, no one racial or ethnic group in Texas will be in the majority. A failure to promote racial and ethnic diversity in higher education will decrease the population of skilled workers and reduce economic growth in Texas (THECB 1998).

While studies abound that consider enrollment demand (e.g., Wetzel, O'Toole, and Peterson 1998; McPherson and Schapiro 1991) and application decisions, (e.g., DesJardins, Dundar, and Hendel 1999; Savoca 1990; Kain and O'Brien 2001) few studies consider the first step in the college choice process: where students send their standardized test scores. Identifying the set of institutions where college-bound students send their SAT and ACT scores remains the most accurate form of revealed preference at the initial stage of the college decision path. Given that earnings are strongly correlated with the selectivity level of the college attended (Dale and Krueger 1998; Bowen and Bok 1998), high-achieving minorities who choose to send their standardized test scores only to colleges and universities with little or no selectivity in their admissions process are potentially placing themselves at a disadvantage even before applying.

In the only study to date, Toutkoushian (2001) examines particular postsecondary institutions in and around New Hampshire where New Hampshire students sent their

SAT scores in 1996. He finds that SAT-takers with and without college-educated parents consider attending the same colleges and universities, and that low incomes do not appear to keep students from considering more expensive or selective schools. However, Toutkoushian suggests the demographic characteristics of New Hampshire limit the study's applicability to most states. New Hampshire currently boasts the lowest child-poverty rate in the nation. Furthermore, its population lacks racial diversity (95 percent of the 2000 state population is white, non-Hispanic), rendering an accurate examination of the influence of race and ethnicity on college choice sets impossible. In contrast, Texas is rich in racial and ethnic diversity—52 percent of the 2000 state population is white, non-Hispanic, 32 percent is Hispanic and 12 percent is black (*Statistical Abstract of the United States* 2000).

This paper examines the four-year college choice sets of over 100,000 college-bound Texas students, as evidenced by where they sent their SAT and ACT scores in 1998. Using multinomial logit regression, I first estimate the probability that students in the sample will send scores to only selective Texas public institutions, only non-selective Texas public institutions, a combination of both, or exclude their scores from Texas public colleges and universities altogether. Focusing only on Texas public colleges and universities allows me to utilize both SAT and ACT data. Empirical results indicate that all else equal, blacks and Hispanics, relative to whites, are less likely to send their scores to selective Texas public institutions, and are more likely to send their scores to less selective institutions. Second, I restrict the analysis to SAT-takers in order to include private and out-of-state schools. Similar analysis reveals that while the selectivity of the college or university still matters, blacks and Hispanics are more inclined to send their scores only to out-of-state institutions.

The paper proceeds as follows. Section 2 analyzes the college choice sets or where students send their standardized test scores. Section 3 presents the empirical model and relates it to previous research. Sections 4 and 5 include the empirical results, and section 6 presents concluding remarks.

2. Defining the Choice Sets: Where Texas Students Send Their Scores

To analyze the college choice sets of Texas high school students, I use data from the Texas Schools Microdata Panel (TSMP), which includes SAT and ACT scores for Texas students taking the standardized tests in 1998, where college-bound students sent their scores, and background information on those students. Of those students taking a college entrance exam in 1998, 48 percent took only the SAT, 21 percent took only the ACT and 31 percent took both exams. The Student Data Questionnaire (SDQ) from the SAT identifies the specific institutions where students had their scores sent. The ACT data does not contain specific identifications of out-of-state institutions--only the state the student sent the score. Furthermore, ACT does not identify any Texas private colleges or universities. Consequently, the only information when considering both SAT and ACT scores is for Texas public colleges or universities. In 1998, 81,734 students sent SAT scores to the colleges in which they were interested, and 71,664 students them to a four-year, Texas public college or university.¹

Table 1 provides a breakdown by the selectivity of the college or university based on national rankings from *Barron's Guide to Colleges and Universities (2000)*. Barron's establishes the selectivity rankings according to median SAT and ACT scores for the entering freshman class, percentages of freshmen ranked in the upper fifth or two-fifths of their high school graduating class, minimum class rank and GPA required for admission, and the percentage of freshmen applicants accepted. In Texas, only five public colleges or universities rank highly selective or selective. Twenty-seven Texas public colleges or universities rank less selective or non-selective.² Both SAT and ACT allow students to send four scores at no additional cost. For additional score reports, SAT charges \$6.50 each and ACT charges \$7 each. Although one would expect a large drop in the number of students sending five scores, Table 1 reveals that of the number of scores sent to all Texas public institutions, the first significant drop-off occurs from two to three. This indicates that these students are more than likely sending scores to private

¹ Although SAT scores exist for 95,080 Texas students, 14 percent elected not to send them.

² Barron's creates more than four levels of selectivity. I include the following Barron's categories in my category of highly selective: most competitive, highly competitive plus, and highly competitive. The selective category includes institutions Barron's labels as very competitive plus, and very competitive. The less-selective category includes institutions Barron's labels as competitive plus and competitive, while non-selective includes institutions Barron's labels as less competitive and non-competitive.

schools and out-of-state schools which cannot be identified when pooling SAT and ACT information. While SAT reports the data for up to 30 college choices, ACT reports only the first six, although students willing to pay can send as many scores as they wish. No student sent more than ten scores.

Of those students that sent SAT scores, 56 percent sent at least one score to a highly selective public institution, which includes only The University of Texas at Austin and Texas A&M University. Thirty-five percent of the students sent their score to at least one selective public institution in Texas, 39 percent sent at least one score to a less selective institution, and 32 percent sent at least one score to a non-selective institution.

Turning to the ACT, 56,408 students sent their ACT scores to a college in which they presumably were interested, and 46,349 students sent those scores to a four-year, Texas public college or university.³ Of those students sending ACT scores, 38 percent sent at least one score to a highly selective public institution in Texas. Twenty-nine percent sent at least one score to a selective public institution in Texas, 37 percent sent at least one score to a less selective institution, and 32 percent sent at least one score to a non-selective institution.

Table 2 combines SAT and ACT scores and profiles the students' choice sets of Texas public colleges and universities by selectivity. When considering only two categories of selectivity, i.e., combining highly selective and selective colleges into one category called selective and combining less selective and non-selective colleges into one category called non-selective, the greatest number of students chose to send their SAT scores to institutions of both types (38 percent), followed by only selective colleges and universities (26 percent). When considering all four categories of selectivity, highly selective, selective, less selective and non-selective, the greatest number of students sent their scores only to highly selective institutions (UT-Austin and Texas A&M), leading the sixteen possible combinations with 14 percent of the students sending SAT scores, ACT scores or both to these schools. Nearly 13 percent sent no scores to Texas public colleges, indicating their choice sets include Texas private colleges or universities or out-of-state public or private schools. The next most popular choice set includes only non-selective institutions, followed by a choice set that includes only less selective schools.

³ Although ACT scores exist for 62,385 Texas students, 10 percent elected not to send them.

Less than 3 percent of the students sent scores to public colleges or universities of all selectivity levels.

3. Modeling College Choice Sets

The primary objective of this research is to determine whether race/ethnicity influences the types of colleges and universities that Texas students send their SAT or ACT scores. When students decide where to send their test scores, they are establishing a personal set of college choices. Depending on whether or not the student applies and is ultimately admitted, college-bound students must eventually decide where to enroll. Their first decision in this process, however, is where to send their standardized test scores. What are the characteristics of students who send scores only to selective schools versus those students that do not? How important is race/ethnicity in predicting the probability that a college-bound student will send his or her scores only to selective schools, even after controlling for income and ability? These are just some of the questions to consider.

Most college choice models divide themselves into several steps. Hossler and Gallagher (1987) propose a three-stage model that draws upon both the economic and sociological literature.⁴ They describe the transition from high school to college as one of predisposition, search and choice. DesJardins, Dundar and Hendel (1999) identify six stages: the formation of college aspirations, the identification and selection process, application, admission, enrollment and attendance. Sending standardized test scores to a particular postsecondary institution falls into the search process in the Hossler and Gallagher model and in the identification and selection process in the DesJardins, Dundar and Hendel model.

Notice how the identification and selection process is distinct from the decision to apply. One of the primary reasons this division is necessary is the current popularity of early decision programs. Today, almost all four-year colleges and universities offer some type of early admissions program to prospective students (*Chronicle of Higher Education*, 2000). Students have the opportunity to apply early to a single institution and receive an early decision—usually by mid-December. Institutions with binding policies

⁴ See Plank and Jordan (2001) for a review of other models.

require all students accepted through early decision programs to attend. Thus, students interested in early decision are likely to send their SAT and ACT scores to multiple institutions—their first-choice as well as their back-up schools. However, if admitted through early decision, those students will never apply to the other colleges and universities to which they sent standardized test scores. The decision on where to send scores and where to apply also remains distinct because of actions by the higher education institutions themselves. Colleges and universities can purchase mailing addresses from high scoring students willing to be contacted directly. They use this information to aggressively recruit students to join the freshman class—even if the student did not choose to send them a score.

At this identification stage of the process, when students decide where to send their test scores, they usually do not focus on one institution. Rather, they tend to compile a list of schools in which they are interested and hope to obtain admission. This decision process can be represented by a random utility model with each choice set expressed in terms of net utility. When the student makes a choice out of several unordered alternatives, we assume that the student derives the greatest net utility from that option (Greene 2000). The net utility of college choice set j for the i^{th} student is

$$U_{ij} = \beta'x_{ij} + \epsilon_{ij}, \text{ such that } \Pr(U_{ij} > U_{ik}) \text{ for all other } k \neq j. \quad (1)$$

An assumption about the distribution of the error term operationalizes the model. Assuming the j disturbances are independent and identically distributed with a Weibull distribution (McFadden 1973), then the multinomial logit model can be expressed as equation (2). Consider the following four outcomes for students choosing to send their SAT and ACT scores to four-year colleges and universities:⁵

- ?? students do not send any scores to Texas public colleges or universities
- ?? students send scores only to selective Texas public colleges or universities

⁵ The previous four categories of selectivity have been collapsed into two: highly selective schools join the selective category and the less selective schools join the non-selective category. Although estimating a model on the 16 choices presented in Table 2 would be ideal, the necessary computer time is prohibitively lengthy.

?? students send scores to both selective and non-selective Texas public colleges or universities

?? students send scores only to non-selective Texas public colleges or universities

Although students send scores to particular institutions, Table 1 reveals most send scores to more than one school. Thus, students are deciding on the optimal set of colleges and universities to send their scores. Some students may choose to increase their chances by sending their scores to colleges of all selectivity levels. Others may decide to play it safe by sending their scores to institutions with little or no selectivity in their admissions process. Still others may be confident enough in their chances of admission to send scores only to selective institutions. The model for college choice sets according to selectivity and conditional on a set of student characteristics is:

$$\text{Prob}(Y_i = j) = \frac{e^{\beta_j X_i}}{\sum_{k=0}^3 e^{\beta_k X_i}}, j = 0, 1, \dots, 3, \text{ where} \quad (2)$$

determinant of college application (Savoca 1990) and, in all likelihood, college aspirations,⁶ this information is only available for SAT-takers, and therefore cannot be used as a control variable. Type of high school isolates the different effects of graduating from a public or private high school as well as alternative types such as charter schools or home schools.

College major choice is tied to future earnings and because some schools have better reputations in some majors than others, I expect intended major to factor into the decision process of where students send their scores. I separate math and science majors from all others because research indicates that life-cycle earnings are higher for science and engineering majors (Berger 1988), and college graduates with mathematical majors earn more than those with other majors (Weinberger 1999). Assuming that college-bound students possess this information when deciding where to send their scores, college major should impact their choice set. Intended terminal degree controls for students with higher postsecondary education goals than others.

4. Empirical Results: SAT and ACT

Recall the empirical model for the predicted probabilities given in equation (2). Because marginal effects depend upon the values of all the independent variables in the model as well as the coefficients for each outcome, they are not easily interpretable. Depending upon the point of evaluation, even the signs can change. Long (1997) suggests using measures of discrete change in the probabilities of each outcome instead. Table 5 contains these discrete changes. For dichotomous variables, Table 5 provides the predicted changes in the probability of each college choice set outcome associated with a change in the dummy variable from zero to one. Table 5 also provides the predicted changes in the probability of each college choice set outcome associated with a one standard deviation increase for each continuous variable. The base category for all comparisons is the choice set *Only Selective Institutions*. Although I do not include the

⁶ Toutkoushian (2001) found that first-generation college students are just as likely to send their SAT scores to the same institutions as their peers with college-educated parents.

original parameter estimates, the predicted changes inherit the significance levels of the ancestor coefficients.⁷ Table 5 also includes those significance levels.

Measures of ability follow the same general pattern across all choices. SAT score and high school GPA are positive and significant only for the choice set *Only Selective*. A 218-point increase in the SAT score increases the probability that a student will send that score only to selective Texas public institutions by 12 percentage points. A grade-level increase in high school GPA increases that probability by 1.3 percentage points. College-bound students with higher SAT scores and higher GPA's are less likely to send scores only to non-selective institutions. Although the predicted changes are small, the number of math and foreign language years a student takes in high school is positively related to the choice set *Only Selective*, while the number of English years is negatively related to both *Only Selective* and *Both Selective and Non-Selective*. Furthermore, each additional year of high school math decreases the probability that a college-bound student will send his or her scores only to non-selective Texas public institutions by 1.2 percentage points. Just as math achievement serves as a better predictor of future earnings relative to other subjects (Grogger and Eide 1995), these findings indicate that math is mildly linked to higher postsecondary aspirations.

Relative to private high school graduates, public high school graduates are less likely to choose *No Texas Publics* or *Only Selective*. Furthermore, being a public high school graduate increases the likelihood that a student will send their scores to Texas public colleges and universities of all selectivity levels by 0.12 relative to their private high school counterparts. The same relationship holds for only non-selective schools, but the effect is much smaller (0.025). Those college-bound students that attended charter schools or were home-schooled decrease the probability of choosing the outcome *Only Selective* by 5 percentage points and increase the probability of choosing *No Texas Publics* by 7 percentage points. Because many students are home-schooled for religious reasons and a large number of private colleges and universities hold religious affiliations, this result is not surprising.

Although family income is significant, the predicted changes are small. Larger family incomes are associated with choosing *Only Selective* or *Both Selective and Non-*

⁷ I must credit Paul Jargowsky for coining this phrase.

Selective. Family income would have to rise by \$31,000 to increase the probability by 2.7 percent that a college-bound student would send scores only to selective institutions. Conversely, higher family incomes are associated with lower probabilities of choosing *Only Non-Selective*. A \$31,000 increase reduces the probability a student would choose *Only Non-Selective* by 3.1 percentage points. These small effects are similar to Toutkoushian's (2001) findings and are especially encouraging given the difference in incomes between New Hampshire and Texas. One might expect negligible income effects on college choice sets for New Hampshire because it is a relatively wealthy state. The results for Texas indicate that at least when considering Texas public colleges and universities, family income does not seem to place a large restriction on the aspirations of college-bound students as evidenced by where they sent their SAT scores.⁸

Overall, those students intending to pursue higher terminal degrees are more likely to send their scores only to selective institutions and less likely to send their scores to non-selective institutions. Intending to pursue a doctorate increases the probability that one will send scores only to selective public colleges and universities in Texas by 6.8 percentage points. Intending to pursue a master's degree increases that probability by 3.6 percentage points.

Finally, race/ethnicity plays an important role in the choice sets of college-bound students. Being Hispanic, relative to being white, increases the probability of sending SAT scores to only non-selective public colleges and universities in Texas by 2.4 percent. That predicted change is even larger for blacks (8.1 percent). Furthermore, being black reduces the probability of choosing *Only Selective* by 6.2 percentage points, while being Hispanic reduces the probability by 2.6 percentage points. Although Hispanics, relative to whites, are more likely to send scores to schools of both selectivity levels, being black reduces the probability of making that choice by 4.6 percentage points. The pattern for college-bound Asians is the exact opposite of the pattern for college-bound blacks. Asians are more likely than whites to consider only selective public colleges and universities in Texas and less likely to send their scores only to non-selective institutions.

⁸ These findings do not preclude a rather large role for family income in determining who these college-bound students are and where they actually attend.

5. Empirical Results: SAT Only

Including both SAT-senders and ACT-senders in the analysis has the disadvantage of excluding private or out-of-state colleges and universities. The category *No Texas Publics* contains colleges and universities of all selectivity levels from across the nation, making the results less clear. To solve this problem, I estimate a similar model using just SAT-takers. Of all the Texas students taking standardized tests in 1998, 79 percent took the SAT and 76 percent sent the score. Although restricting the sample to SAT-takers eliminates nearly one quarter of the observations in a non-random fashion, the information gained from being able to identify private and out-of-state institutions outweighs those concerns.⁹

I expand the categories of the dependent variable to seven, allowing special consideration of the colleges and universities in Texas. As before, selectivity is a key concern, but the location of the institution is more important than whether it is public or private. The reason is simply that most Texas high school graduates choose to attend Texas postsecondary institutions. In 1997, for example, 85 percent of Texas high school students enrolling as first-time freshman enrolled in four-year Texas public or private universities (Kain and O'Brien 2000). The seven categories of the dependent variable (where college-bound Texas students sent their SAT scores) are as follows:

- ?? Only Selective Texas Institutions
- ?? Only Selective Out-of-State Institutions
- ?? Only Selective Institutions in Texas and Out-of-State
- ?? Both Selective and Non-Selective Texas Institutions
- ?? Both Selective and Non-Selective Out-of-State Institutions
- ?? Both Selective and Non-Selective Institutions in Texas and Out-of-State
- ?? Only Non-Selective Institutions

⁹ In addition to the sample selection issue mentioned above, multinomial logit models depend upon the independence of irrelevant alternatives (IIA) assumption. In this application, as in many others, the data violate that assumption. One possible remedy is to specify a multinomial probit model which allows for correlation of the error terms between the different outcomes. However, multinomial probit models are computationally difficult especially when computing predicted probabilities for more than two outcomes. Furthermore, convergence requires additional restrictions beyond those necessary for identification, making it more difficult to obtain meaningful parameter estimates (Greene 2000).

Table 6 provides the distribution by category. Thirty-five percent of the Texas students sending SAT scores in 1998 sent them to both selective and non-selective institutions within the state. Twenty-three percent of the students sent their scores only to selective colleges and universities. Of the 17,497 students that did so, 4 percent are black, 14 percent are Hispanic and 67 percent are white. Compare that to the 9,567 students that sent their SAT scores only to non-selective institutions: 19 percent are black, 29 percent are Hispanic and 44 percent are white. Blacks and Hispanics are over-represented in this category (only 10 percent of the entire sample are black and only 21 percent are Hispanic), while whites are under-represented (58 percent of the entire sample are white).

In addition to expanding the dependent variable categories to seven, I also include an independent variable previously unavailable for the analysis utilizing both SAT and ACT scores, i.e., parental education. Students report the highest level of education attained by both mother and father on the SDQ. I use the father's level of education and replace any missing values with the mother's education. The dummy variable is coded one if the parent attained a high school diploma or less. I label this variable *First Generation College Student*. The means and standard deviations for this model are reported in Table 7, and the predicted discrete changes are presented in Table 8. The base category for comparison is *Only Non-Selective Institutions*.

Overall, sending scores to schools of greater selectivity is associated with higher SAT scores. SAT score is positive and significant for every choice but two: *Selective and Non-Selective in Texas* and *Only Non-Selective*. Relative to non-selective institutions, a 200-point increase in the SAT reduces the probability of students choosing to send their scores only to non-selective schools by 5.3 percentage points. Recall that the largest percentage of Texas students sending their scores in 1998, over one-third, chose to send their scores to institutions of all selectivity levels, but restricted their choices to in-state schools. A 200-point increase in SAT score decreases the probability of making that choice by 8.5 percentage points. In contrast, higher SAT scores are associated with greater probabilities of sending scores to institutions of all selectivity levels both in Texas and out-of-state.

Lower high school GPAs are associated with higher probabilities of choosing to send SAT scores only to non-selective institutions, but the results are less clear for the other categories. While students with higher GPAs are more likely to send their scores only to selective schools in Texas, they are less likely to send their scores only to selective schools out-of-state. However, the magnitudes are small.

As before, higher family incomes are associated with greater probabilities of choosing the more selective options when sending SAT scores and a lower probability of choosing *Only Non-Selective*. Like New Hampshire, the family incomes of Texas students do not seem to limit the college aspirations of these students as evidenced by where they sent their SAT scores. A \$31,000 increase in family income increases the probability of choosing *Only Selective in Texas and Out-of-State* by 1.1 percent while reducing it by 1.7 percent for *Only Non-Selective*.

Being a first-generation college student reduces the probability of choosing the most selective options, although the predicted changes are small. First generation college students are less likely to send their scores to selective institutions both in Texas and out-of-state. These students are also more likely to choose *Only Non-Selective*. These results are in contrast to Toutkoushian (2001), who found that first-generation students and those with college-educated parents sent their SAT scores to similar colleges and universities in New Hampshire. Also of interest, those first-generation college students sending scores to schools of all selectivity levels seem to want to remain closer to home. Being a first-generation college student increases the probability of choosing *Selective and Non-Selective in Texas* by 1.7 percentage points. Contrast that to the negative signs on *First Generation College Student* for the categories of all selectivity levels that include out-of-state schools.

Turning to type of high school, the empirical results indicate that relative to private high school students, public high school graduates in Texas love their in-state colleges and universities. Graduating from a public high school reduces the probability of considering only selective out-of-state institutions by 1.5 percentage points and reduces the probability of considering both selective and non-selective out-of-state institutions by 1.8 percentage points. On the other hand, being a public high school graduate increases the probability of choosing *Selective and Non-Selective in Texas* by

9.3 percentage points. *Other High School* is statistically significant for only two categories.

As found in the first set of results, there is an overall positive relationship between the number of years students studied math in high school and the more selective college choice sets. In fact, an additional year of math increases the probability that a student will send scores only to selective institutions in Texas and out-of-state by 12 percentage points. Just under an additional year of high school English reduces the probability of choosing *Only Selective in Texas* by 1.1 percentage points and increases the probability of choosing *Only Non-Selective* by 1.5 percentage points. Intending to major in science or math has a small positive effect on the probability of sending SAT scores only to selective Texas colleges and universities and a small negative effect on sending SAT scores only to non-selective institutions.

Relative to obtaining a bachelor's degree, those intending to pursue master's degrees or doctorates are more likely to send their SAT scores to selective institutions (save *Only Selective Out-of State* for master's degree) and less likely to send their scores to non-selective institutions. Intending to pursue a doctorate, for example, increases the probability of sending scores only to selective colleges and universities in Texas and out-of-state by 5.3 percentage points. Intending to pursue an associate's degree, relative to a bachelor's degree, is not significant for any of the selective categories, and reduces the probability of sending SAT scores to both selective and non-selective schools in Texas and out-of-state by 11.8 percentage points. Intending to obtain an associate's degree increases the probability of sending scores only to non-selective institutions by 8.4 percentage points.

The previous analysis that focused on Texas public colleges and universities highlighted the large role selectivity plays in where college-bound minorities send their SAT and ACT scores. Although selectivity remains a factor, including private and out-of-state institutions changes the story from one of selectivity to one of in-state versus out-of-state. Although blacks and Hispanics are still less likely than whites to send their SAT scores only to selective Texas colleges and universities, they are *more* likely than whites to send their scores only to selective out-of-state schools. Furthermore, being black reduces the probability of sending scores to schools of all selectivity levels in the state of

Texas by 17 percentage points. In contrast, being black increases the probability of sending scores to Texas and out-of-state institutions of all selectivity levels by 19 percent. This is the largest predicted change amongst all the independent variables. Being black or Hispanic increases the probability of choosing Only Non-Selective, but the effects are much smaller than the previous results. Selectivity still matters, but whether the school is in Texas or not has a significant impact on the college choice sets of minorities.

What about the influence of historically black colleges and universities (HBCUs)? Perhaps the influence of race and ethnicity on where students send their SAT scores is partially due to omitted variable bias. Of the 8,053 black students sending their SAT scores, 4,256 sent at least one score to an HBCU. Of those, 78 percent sent no more than two scores to HBCUs. After controlling for those students sending at least one score to an HBCU, being black relative to white reduces the probability of sending scores only to non-selective institutions by 2.6 percentage points.¹⁰ This is in contrast to the positive sign and small coefficient found in the results presented in Table 8 and most likely due to the fact that HBCUs tend to be less selective in their admissions process. However, the overall results still hold. Blacks and Hispanics are still less likely to send their scores only to selective Texas institutions, and more likely to send them only to selective schools out-of-state. In fact, the magnitude on the black coefficient for *Only Selective Out-of-State* is even larger—2.4 percentage points compared to 1.1 reported in Table 8.

6. Conclusions and Policy Recommendations

Even after controlling for standardized test scores, high school GPA and family income, blacks and Hispanics were less likely than whites to send their SAT and ACT scores to selective public institutions in Texas in 1998, and more likely to aim no higher than non-selective schools. These are sobering results, given that recent research (Kane 1998; Bowen and Bok 1998) indicates that attending a selective university is associated with higher degree completion rates and higher wages after graduation for *all races*. At first glance, it would seem that blacks and Hispanics view their college choice sets to be different from whites and non-Hispanics, setting themselves up for future disadvantages through lower graduation rates and lower wages at the earliest stage of the game.

¹⁰ Results are available upon request.

However, restricting the sample just to SAT-takers reveals that blacks and Hispanics are actually *more* likely than whites to send their scores only to selective colleges and universities—as long as they are out-of-state. High-performing minorities, relative to their white counterparts, seem to be willing to substitute selective out-of state colleges and universities for selective Texas institutions. This is despite the fact that a full year before most of these students took the SAT in the spring of 1998, then-Governor Bush signed into law the Texas Top Ten Percent Law, guaranteeing automatic admission to any Texas public college or university for students graduating in the top 10 percent of their high school class. Furthermore, these college-bound minorities could be signaling a willingness to forgo the financial breaks often given to students attending in-state schools, assuming the students are not awarded financial aid packages from out-of-state institutions. This may not be the case, considering many other states can still recruit minorities with scholarships.

The crucial question I intend to answer in the future is whether this is a new phenomenon related to the *Hopwood* case, or one that existed prior to the Fifth Circuit Court’s elimination of affirmative action policies in the admissions decisions of Texas public colleges and universities.¹¹ Anecdotal evidence suggests that surrounding states are siphoning off Texas’ college-bound minority population because those state schools still practice affirmative action and can offer minority scholarships. The empirical results certainly indicate that blacks and Hispanics are willing to leave Texas to pursue postsecondary education, although the reasons remain unclear. This should be enough to concern Texas higher education officials and policymakers. But even more disturbing is the possibility that this phenomenon is an unintended consequence of the *Hopwood* decision, and one that has not been mitigated by the Top Ten Percent Law. Despite glowing reports that claim minority enrollments at selective Texas public universities have rebounded to pre-Hopwood levels, few officials touting these results consider the large growth in minority graduation rates from Texas high schools. Kain and O’Brien (2001) actually find that black and Hispanic enrollments at selective Texas public colleges and universities remain significantly below pre-Hopwood levels, when

¹¹ Historical data is not presently available.

controlling for other factors. These results are not surprising given my findings that college-bound minorities are more likely to consider out-of-state schools at the outset.

Although the second set of results highlight the importance of school location, selectivity issues do not disappear. Being black and Hispanic still increases the probability that a student will send his or her SAT scores only to non-selective institutions, although the effects are small. These results indicate a need for a policy response. One such response would be to provide additional support for guidance counselors to identify these students and encourage them to send their scores to more selective schools. However, guidance counselors have been called upon to advise increasing numbers of students in recent years, and the market has responded with commercial college counseling services that some argue will only widen the racial and ethnic gap that exists in the college choice process (Walsh 1999). An even broader recommendation involves strengthening the education pipeline. Through simulations using the TSMP, Kain and O'Brien (2000) find that narrowing the performance gap between blacks and whites and Hispanics and whites on middle-school standardized tests would have a significant impact on the enrollment rates of blacks and Hispanics at selective Texas public universities. They also find that overall improvement in the quality of the elementary schools attended by disadvantaged minorities would increase their chances of being accepted at and enrolling in selective universities. This solution is certainly easier to prescribe than to implement, but failure to recognize the crucial links between primary and secondary education places many minority students at a disadvantage, even those that are well prepared. Finally, these findings suggest an ongoing need for aggressive minority recruitment efforts on the part of selective colleges and universities or Texas college-bound minorities may continue not to even give Texas higher education a second glance.

Table 1: Distribution of Students by the Number of Scores Sent to Four-Year, Texas Public Colleges and Universities^a in 1998

Number of Scores	All Texas Schools		Highly Selective		Selective		Less Selective		Non-Selective	
	SAT	ACT	SAT	ACT	SAT	ACT	SAT	ACT	SAT	ACT
0	10,070	10,059	35,643	34,801	53,402	39,903	49,701	35,601	55,837	38,460
1	21,188	16,422	31,288	16,656	24,310	14,966	23,541	16,703	21,503	14,569
2	22,283	16,221	14,803	4,942	3,957	1,534	7,119	3,612	3,877	3,040
3	16,719	10,208		9	65	5	1,252	468	464	330
4	8,217	3,356					112	24	51	8
5	2,379	109					8		2	1
6	676	33								
7	155									
8	35									
9	10									
10	2									

Source: Texas Schools Microdata Panel

Total SAT=81,734 Total ACT=56,408

Selectivity rankings are based upon national categories established by *Barron's Guide to Colleges and Universities*.

a. Highly Selective: Texas A&M and The University of Texas at Austin.

Selective: Southwest Texas State, Texas Tech, and The University of Texas at Dallas.

Less Selective: Midwestern State, Sam Houston, Stephen F. Austin, Texas A&M-Commerce, Texas A&M-Kingsville, Texas A&M-Galveston, The University of Houston, The University of North Texas and West Texas A&M.

Non-Selective: Angelo State, Lamar, Prairie View, Sul Ross, Tarleton, Texas A&M-Corpus Christi, Texas A&M-Texarkana, Texas Southern, Texas Women's University, The University of Texas at Pan American, The University of Texas at Arlington, The University of Texas at Brownsville, The University of Texas at El Paso, The University of Texas at San Antonio, The University of Texas at Tyler, The University of Houston-Downtown, The University of Houston-Clear Lake, and The University of Houston-Victoria.

Table 2: Characterizing Each Student’s College Choice Set of Texas Public Colleges and Universities As Evidenced by Where They Sent Their SAT and ACT Scores

College Choice Set By Selectivity of the Institution	Number of Students	Percent
Two Categories of Selectivity		
Both Selective and Non-Selective	40,114	37.5
Only Selective	27,420	25.6
Only Non-Selective	25,727	24.1
No Texas Publics	13,706	12.8
Total	106,967	100
Four Categories of Selectivity		
Only Highly Selective	14,965	14
No Texas Publics	13,706	12.8
Only Non-Selective	9,228	8.6
Only Less Selective	8,908	8.3
Highly Selective & Selective	8,568	8.0
Highly Selective & Less Selective	7,938	7.4
Less Selective & Non-Selective	7,591	7.1
Highly Selective, Selective & Less Selective	6,078	5.7
Highly Selective & Non-Selective	4,889	4.6
Highly Selective, Less Selective & Non-Selective	4,624	4.3
Highly Selective, Selective & Non-Selective	3,993	3.7
Only Selective	3,887	3.6
Selective & Less Selective	3,605	3.4
Selective & Non-Selective	3,487	3.3
All Selectivity Levels	2,839	2.7
Selective, Less Selective & Non-Selective	2,661	2.5
Total	106,967	100

Source: Texas Schools Microdata Panel

Table 3: Description of Independent Variables Used in Multinomial Logit Model

Variable	Description
SAT Score	Combined math and verbal score; ACT scores have been converted to an equivalent SAT score
High School GPA	High school GPA on a 4-point scale
Public High School	Dummy variable equal to one if student attended a public high school
Other High School	Dummy variable equal to one if student attended a charter school, correspondence school or home school
Family Income	Midpoint of each range reported by SAT and ACT (in thousands)
Native American	Dummy variable equal to one if student is Native American
Asian	Dummy variable equal to one if student is Asian
Black	Dummy variable equal to one if student is African American
Hispanic	Dummy variable equal to one if student is Mexican/Mexican American, Puerto Rican, Latin American, South American, Central American or other Hispanic or Latino
Foreign	Dummy variable equal to one if student is foreign or of another race/ethnicity than above categories
Male	Dummy variable equal to one if student is male
English Years	Number of years student studied English in high school
Math Years	Number of years student studied math in high school
Foreign Language Years	Number of years student studied foreign languages in high school
Science/Math	Dummy variable equal to one if student intends to major in a subject within the general categories of agriculture, biology, CIS, engineering, health, math, military science or the physical sciences
Associate's Degree	Dummy variable equal to one if the intended terminal degree is an Associate's Degree
Master's Degree	Dummy variable equal to one if the intended terminal degree is a Master's Degree
Doctorate	Dummy variable equal to one if the intended terminal degree is a Doctoral Degree
Other Degree	Dummy variable equal to one if the intended terminal degree is a Certificate or other degree
Degree Undecided	Dummy variable equal to one if the student has not decided terminal degree

Table 4: Descriptive Statistics for Multinomial Logit Model

Variable	Mean	Std. Dev.
SAT or ACT Score (00's)	9.58	2.18
High School GPA	3.17	0.92
Family Income (000's)	43.657	31.183
Native American	0.01	0.08
Asian	0.05	0.21
Black	0.10	0.30
Hispanic	0.22	0.41
Foreign	0.03	0.16
White	0.56	0.50
Male	0.45	0.50
Public High School	0.90	0.30
Private High School	0.07	0.25
Other High School	0.005	0.07
English Years	3.71	0.91
Math Years	3.43	0.97
Foreign Language Years	3.01	2.05
Science/Math	0.42	0.49
Associate's Degree	0.03	0.16
Bachelor's Degree	0.26	0.44
Master's Degree	0.27	0.44
Doctorate	0.25	0.43
Other Degree	0.02	0.15
Degree Undecided	0.15	0.36

Source: Texas Schools Microdata Panel
N=106,967

Table 5: Predicted Discrete Changes for Sample Including Both SAT and ACT

	No Texas Publics	Only Selective	Both Selective and Non-Selective	Only Non-Selective
SAT Score	-0.004**	0.12	-0.036**	-0.08**
High School GPA	-0.003**	0.013	-0.003**	-0.007**
Family Income	-0.004**	0.027	0.008**	-0.031**
Native American	0.012	-0.008	-0.026	0.022
Asian	-0.042**	0.013	0.095**	-0.066**
Black	0.027**	-0.062	-0.046**	0.081**
Hispanic	-0.02	-0.026	0.022**	0.024**
Foreign	0.019**	-0.024	-0.003*	0.008**
Male	-0.004**	0.036	0.017**	-0.049**
Public High School	-0.11**	-0.032	0.12**	0.025**
Other High School	0.07**	-0.051	-0.024	0.008*
English Years	0.004**	-0.029	-0.002**	0.027**
Math Years	-0.006**	0.006	0.011	-0.012**
Foreign Language Years	-0.009**	0.012	0.031*	-0.034**
Science/Math Major	-0.032**	-0.002	0.04**	-0.007
Associate's Degree	0.212**	0.002	-0.21**	-0.006
Other Degree	0.104**	0.004	-0.096**	-0.012
Master's Degree	-0.016**	0.036	0.025**	-0.045**
Doctorate	0.021**	0.068	-0.034**	-0.056**
Degree Undecided	0.001**	0.036	-0.004**	-0.032**

Source: Texas Schools Microdata Panel

N=106,697

Only Selective is the base category so significance levels are not reported.

The omitted categories for type of high school, race/ethnicity, gender, science/math college major, and intended terminal degree are private high school, white, female, all other majors and bachelor's degree, respectively.

* 5-percent significant level; ** 1-percent significant level

Predicted changes for discrete variables represent a change from zero to one and a change of one standard deviation for continuous variables.

Table 6: Dependent Variable Categories for Sample Restricted to SAT-Takers

College Choice Sets	Frequency	Percent
Only Selective Texas Institutions	7,525	9.7
Only Selective Out-of-State Institutions	976	1.3
Only Selective Institutions: Texas and Out-of-State	8,996	11.6
Both Selective and Non-Selective Texas Institutions	26,761	34.5
Both Selective and Non-Selective Out-of-State Institutions	1,325	1.7
Both Selective and Non-Selective Institutions: Texas and Out-of-State	22,526	29.0
Only Non-Selective Institutions	9,567	12.3

Source: Texas Schools Microdata Panel
N=77,676

Table 7: Descriptive Statistics of Sample Restricted to SAT-Takers

	Mean	Std. Dev.
SAT Score	10.155	1.995
High School GPA	3.306	0.829
Family Income (000's)	48.033	31.235
First Generation College Student	0.277	0.447
Native American	0.007	0.081
Asian	0.057	0.233
Black	0.104	0.305
Hispanic	0.206	0.404
Foreign	0.028	0.165
Male	0.455	0.498
Public High School	0.904	0.294
Other High School	0.004	0.061
English Years	3.763	0.807
Math Years	3.533	0.885
Foreign Language Years	3.318	2.079
Science/Math Major	0.444	0.497
Associate's Degree	0.010	0.099
Other Degree	0.016	0.124
Master's Degree	0.305	0.461
Doctorate	0.256	0.437
Degree Undecided	0.173	0.378

Source: Texas School Microdata Panel
N=77,67

Table 8: Predicted Discrete Changes for Sample Restricted to SAT-Takers

	Only Selective in Texas	Only Selective Out-of- State	Only Selective Texas and Out-of- State	Selective and Non- Selective in Texas	Selective and Non- Selective Out-of- State	Selective and Non- Selective Texas and Out-of- State	Only Non- Selective
SAT Score	0.0008**	0.012**	0.11**	-0.085**	0.0009**	0.013**	-0.053
High School GPA	0.004**	-0.001**	0.008**	0.003**	-0.002**	-0.0003**	-0.012
Family Income	0.008**	0.007**	0.011**	-0.01**	0.0005**	0.006**	-0.017
First Generation College Student	-0.003**	-0.0006**	-0.009**	0.017**	-0.002**	-0.012**	0.01
Native American	-0.022	0.007	0.023	-0.081	-0.016**	0.062	-0.005
Asian	-0.025**	-0.002**	0.065**	0.0016**	-0.005	0.008**	-0.056
Black	-0.075**	0.011**	0.006**	-0.17**	0.031**	0.187**	0.009
Hispanic	-0.043**	0.004**	0.024**	-0.042**	-0.001	0.056**	0.003
Foreign	-0.032**	0.006*	0.014**	-0.069*	0.013**	0.072**	-0.005
Male	0.006**	-0.00002**	0.018**	-0.033**	0.003**	0.036**	-0.030
Public High School	0.020**	-0.015**	-0.027**	0.093**	-0.018**	-0.048**	-0.005
Other High School	-0.050*	-0.005	0.018	-0.061	0.035**	0.052	0.011
English Years	-0.011**	-0.0005**	-0.009**	0.01**	0.0002**	-0.005**	0.015
Math Years	0.002**	-0.001	0.12**	0.002**	-0.0003	0.007**	-0.008
Foreign Language Years	-0.002**	0.001**	0.011**	-0.004**	0.002**	0.017**	-0.024
Science/Math Major	0.006**	-0.005**	-0.005	0.019**	-0.006**	-0.004	-0.006
Associate's Degree	0.059	0.013	0.033	-0.070**	-0.002	-0.118**	0.084
Other Degree	0.036	0.011	0.020	-0.067**	0.007	-0.033	0.025
Master's Degree	0.0008*	-0.00004**	0.025**	-0.018**	0.0002**	0.028**	-0.036
Doctorate	0.012**	0.005**	0.053**	-0.052**	0.003**	0.033**	-0.053
Degree Undecided	0.009**	0.004**	0.023**	-0.028	0.003**	-0.004*	-0.007

Source: Texas School Microdata Panel N=77,676

Only Non-Selective is the base category so significance levels are not reported.

Predicted changes for discrete variables represent a change from zero to one and a change of one standard deviation for continuous

*5-percent significance level

**1-percent significance level

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