High School Quality and Race Differences in College Achievement

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Abstract

This paper uses 10 years of enrollment data at three Texas public universities to examine whether, to what extent, and in what ways racial and ethnic differences in college achievement can be traced to high school attended. To identify school attributes responsible for unequal college readiness, we estimate fixed effects models for three high school strata defined by the socioeconomic composition of the student body. We find that high school affluence *does not* insulate minority students from achievement disparities vis-à-vis their same school classmates beyond the first semester. Furthermore, high school influences on academic achievement carry over through the college career, but only at institutions with selective admissions.

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I. Introduction

A longstanding controversy about the sources of racial and ethnic differences in academic achievement revolves around the relative importance of individual and institutional factors. This debate occupied center stage following the release of the landmark Coleman Report (Coleman, et al., 1966), which argued that family background, rather than features of educational institutions, is the primary determinant of low student achievement. Another prominent study by Jencks and associates (1972) supports Coleman's claim that school influences on achievement gaps are substantively trivial, although they conceded that average school traits conceal more than they reveal under conditions of high socioeconomic inequality. Despite his sweeping generalization about the salience of family compared to school effects on achievement, even Coleman conceded that black students attending integrated schools outperformed their race counterparts who attended segregated schools.

In light of the counterintuitive conclusion that school quality is responsible for a negligible share of the K-12 achievement gap, these two influential studies spawned numerous investigations that sought to identify the features of schools where economically disadvantaged students reach high levels of academic achievement. Researchers searched for sources of variation in academic outcomes that may be correlated with family background, but either intensify or attenuate the direct influences of family background on student achievement. Murnane's (1981) review of the school effectiveness literature concludes that schools can and do influence student learning. Based on a wide-ranging review of the empirical literature about school effects, Rutter (1983) explains that the mixed evidence reflects extensive variation both in the criteria used to characterize school effectiveness and the outcome measures of student

achievement. Likewise, a meta-analysis of school effects on student performance by Hedges and associates (1994) concludes that the median association is both large and substantively important, but they did not consider links between high school attributes and postsecondary outcomes.

In fact, with few exceptions studies of school effects on student performance largely ignore post-secondary achievement. Furthermore, much of the available evidence about links between high school economic mix and postsecondary outcomes is not only dated, but also focused on college intentions rather than actual performance outcomes (Myers, 1970; Alwin and Otto, 1977). That minority students are disproportionately concentrated in low-performing, under-resourced high schools complicates the task of teasing out unique influences of family background and school quality on academic outcomes, including postsecondary performance. Although higher education draws from the upper half of the K-12 achievement distribution, minority students who attend post secondary institutions perform at lower levels, on average.

For example, Vars and Bowen (1998) show that white students achieve higher college grades than black students across five SAT strata, even after controlling for family background and high school achievement. Yet, Light and Strayer (2000) find that blacks and Hispanics are more, not less, likely to graduate from college than their white counterparts of comparable ability. Kane (1998) also concludes that among black students, those who attend more selective colleges have higher graduation rates compared with those who attend less selective colleges. Using two nationally representative longitudinal surveys and a retrospective survey of students who were enrolled at selective and highly selective institutions, Alon and Tienda (2005) affirm that both minority and white students who attended selective institutions were more likely to graduate than their statistical counterparts attending less selective colleges, even after modeling

the selection regime into the most competitive institutions. Because selectivity of college attended is correlated with persistence and the likelihood of completion, high school influences on performance likely operate via institutional selectivity (Velez, 1985; Braxton, et al., 1997; Bowen and Bok, 1998; Light and Strayer, 2000; Alon and Tienda, 2005; Schneider, et al., 2006).

Building on research that links high school quality to collegiate academic achievement, we investigate whether race differences in college grades depend on the quality of high school attended, and if so, whether the performance gaps also differ according to institutional selectivity. Both issues are policy relevant inasmuch as social class variation remains a salient concern for selective institutions seeking to broaden postsecondary access to underrepresented groups (Finder 2008; Kahleberg 2004; 2010; Nicol 2008) and they undergird persisting controversies about the fairness and wisdom of race preferences in college admissions (Bowen and Bok, 1998).

The next section summarizes prior studies that link pre-collegiate achievement and postsecondary outcomes, focusing on variation in high school quality and ethno-racial gaps in grades, persistence and graduation. Section III justifies the value of Texas as a case study to address theoretical debates about individual and institutional determinants of postsecondary achievement gaps. Specifically, we capitalize on a statewide change in college admission criteria that shifted emphasis from ascribed attributes of individual students to attributes of enrollees' high schools. Following a description of the data and estimation strategy in Section IV, we present empirical results in Section V. We find that attending an affluent high school *does not* insulate minority students from achievement disparities vis-à-vis their same school classmates beyond the first semester. Furthermore, high school influences on academic achievement carry

over through the college career at least through 4-year graduation, but only at selective institutions. Section VI summarizes key findings and considers policy implications.

II. Prior Studies

Early studies seeking to establish links between high school attributes and collegiate outcomes focus on postsecondary intentions (or aspirations) rather than actual behavior. As one of the first studies to consider how the economic mix of a high school influences college behaviors, Meyer's (1970) highly influential study of college intentions shows that average ability students attending high-income schools exhibit lower college intentions than their status counterparts attending low-income schools. Social comparison is the alleged mechanism, but school climate, peer influences, and curriculum placement (e.g., tracking) are also viable contenders (Rutter, 1983).

Comparatively fewer studies consider whether and to what extent high school effects persist beyond the enrollment decision, and in particular whether race and ethnic variation in the quality of high school attended contributes to college performance. Nevertheless, several studies suggest these influences exist (Summers and Wolfe, 1977; Massey, 2006; Schneider, et al., 2006; Niu, et al., 2006). Manski and Wise (1983) contend that students who attended "better" high schools are more likely to persist in college than students of comparable SES and academic achievement who attended high lower quality schools. They represent school quality using the share of the high school class that enrolled in college.

Hill (2008) explains how high schools' commitment to link students with postsecondary institutions fosters race and ethnic variation in college enrollment. Specifically, if high schools operate as clearinghouses rather than brokers, college enrollment rates are low and presumably

so also are academic achievements. Her analyses demonstrate that lower performing schools, which also have high shares of low-income students, use the minimalist clearinghouse approach. Yet, these are precisely the students who would most benefit from both school administrator and parental involvement in the college preparation process. Hill's analysis suggests that high school economic status is a reasonable proxy for the college orientation of the school.

Because postsecondary attendance is not compulsory and draws from the upper half of the achievement distribution, one might expect smaller race and ethnic differences in academic achievement in college compared to high school. At selective institutions in particular, admission officers seek applicants that are likely to succeed, yet racial and ethnic gaps in performance and graduation persist (Vars and Bowen, 1998; Sacerdote, 2001). That minority students average lower standardized test scores than nonminority students is used to argue against race-sensitive criteria that give black and Hispanic students an admission advantage (Alon and Tienda, 2007). This rationale not only presumes that standardized test scores are reliable predictors of college success, but also ignores the role of schools in producing inequities in college preparedness.

Despite the relative neglect of empirical research establishing links between high school quality and postsecondary performance, there are compelling reasons to expect an association. First, high schools differ appreciably in their student mix, their college-going traditions, and their curricula, all of which likely carry over to postsecondary choices and academic success (Manski and Wise, 1983; Meyer, 1970; Jencks and Mayer, 1990). For example, McDonough (1997) posits that high school attended dictates whether selective postsecondary institutions are even envisioned as possible options, which is consistent with findings by Niu and associates (2008) showing that both the number and the selectivity of institutions named by seniors interested in attending college differed vastly according to the socioeconomic mix of high schools. They also

show that minority students attending poor or highly segregated public high schools are less likely than similarly situated whites to enroll at a selective institution, even if they qualify for college admission.

Massey (2006) argues that minority students who attend selective universities attend lower quality high schools that differ on a variety of difficult-to-measure dimensions, such as levels of violence and college-orientation, which in turn carry over to their college experiences. In another study based on enrollees at seven selective colleges and universities in the late 1990s, Espenshade and Radford (2009) find an association between high school quality and college performance that is independent of individual attributes and family background. Specifically, they show that students who attended elite high schools are significantly more likely to graduate within six years compared with statistically equivalent students who attended non-elite high schools.

Several recent studies capitalized on changes in admission regimes in Texas to identify possible links between high school economic mix and various aspects of college behavior, including application behavior and college choices. For example, Koffman and Tienda (2010) show that students from affluent high schools who qualify for automatic admission are significantly more likely to apply compared with comparably ranked students from poor high schools. Based on a representative longitudinal survey of Texas public school graduates, Niu and Tienda (2008) find a strong association between both the number and selectivity of institutions included in students' college choice sets and the socioeconomic mix of their high school. Using administrative data from four public Texas institutions, Fletcher and Tienda (2010) implement a school-fixed-effects methodology to consider whether race and ethnic gaps in college academic performance can be traced to group differences in the types of high schools attended. They show

that black-white and Hispanic-white college performance gaps are mostly eliminated, and often reversed, when students compared attend the same high school. Their results strongly implicate variation in high school quality in producing postsecondary achievement gaps, but they stop short of directly examining high school attributes that might explain race and ethnic variation in postsecondary academic achievement.

Building on this work, we hypothesize that racial and ethnic collegiate performance gaps will differ according to high school quality, but it is unclear whether minority students from the poorest high schools outperform their white classmates. On the one hand minority students from disadvantaged backgrounds may be highly motivated to succeed, especially if they are first or second generation students. On the other hand, white students attending poor high schools may be less economically disadvantaged than their minority counterparts. Because collegiate performance of minority students also depends on institutional selectivity (Bowen and Bok, 1998; Alon and Tienda, 2005), we compare academic outcomes at three universities whose admission regimes range from highly selective to noncompetitive. Before turning to the data and methods, we explain the circumstances from our Texas case study that refocused attention on the significance of high school quality for college performance.

III. Texas College Admissions and the School Quality Debate

During the late 1990s, the state of Texas assumed center stage in the higher education drama about race-sensitive admission preferences. In a bold response to court-ordered ban on use of race in college admissions (see *Hopwood v. University of Texas*), the 75th Texas legislature passed H.B. 588, which guarantees automatic admission to any Texas public college or university for all students who graduate in the top 10 percent of their class. Initial political

support for H.B. 588, popularly known as the top 10% law, derived from its race-neutral admission criteria that were applied uniformly to all high schools, irrespective of size, wealth, or location. Both political and public support dissipated, however, as the demand for access to the flagships surged and students qualified for the admission guarantee swamped the UT-Austin campus, taxing both its carrying capacity and the ability of admission officers to balance the freshman classes along multiple dimensions (Tienda and Sullivan, 2009).

Texas ranks 43rd out of 50 in high school graduation rates (White, 2010), but the statewide average rate of 60 to 65 percent (depending on how the rate is calculated) conceals large disparities across districts and among demographic groups. For example, the Alliance for Excellent Education (2009) reports that just over half of black (52 percent) and Hispanic (56 percent) students graduated in the 2005-06 academic year, compared with three-fourths of white and 85 percent of Asian students. Equally large variation in graduation rates is evident across districts, which range from 100 percent to a low of 40 percent (Texas Education Agency, 2009).

The vast economic heterogeneity of Texas public high schools suggests the testable hypothesis that differences in the quality of Texas public high schools are partly responsible for race and ethnic differences in college performance gaps. Furthermore, the top 10% admission regime likely increased salience of high school quality for academic achievement for two reasons. First, because eligibility for automatic admission is determined on a high school-specific basis rather than standardized statewide criteria, top ranked students from every high school—rich or poor—qualify for the guarantee. Second, the two public flagships—the University of Texas at Austin (UT) and Texas A&M University (TAMU)—each implemented a scholarship program designed to ensure that rank-eligible students from low-income high schools could enroll (Domina, 2007).

In fact, the number of high schools represented among applicants and matriculants to UT increased under the top 10% regime (Montejano, 2001; Long, et al., 2010), including many with high shares of low-income students. Because the Texas percent plan guarantees admission to a segment of the top-performing students *of each high school* in the state, it theoretically leveled the playing field by diversifying the high school feeding patterns to the State's four-year public institutions (Long, et al., 2010). It is conceivable, as critics of the percent plan allege, that students from high schools with low college-going traditions will underperform academically compared with their classmates who graduated from high schools with a strong college orientation.

Although graduates from high schools that largely serve economically disadvantaged students are less likely to attend college even if they qualify for admission (Niu, et al., 2008), those who decide to attend are largely drawn from the very top ranks of the high school achievement distribution, particularly at the most selective institutions. The recruitment of students from poor high schools has direct implications for racial and ethnic gaps in college performance because minority students are disproportionately represented at resource-poor schools and because students who attend poor schools tend to be low-performing relative their peers who graduate from affluent schools.

Just as critics of affirmative action alleged that relaxing the test score threshold for minority students is responsible for the race gap in collegiate achievement, critics of the top 10% law claim that it privileges graduates from low-quality high schools over lower-ranked graduates from highly competitive schools who presumably are better prepared academically even if they do not qualify for the admission guarantee. In effect, the change in admission regime shifted the focus of criticism about admission preferences from individual ascription (i.e., race and ethnic

status) to organizations, namely high schools of differing quality. The admissions and merit debate in Texas parallels that about the relative importance of individual, family and school influences of academic achievement, offering a propitious opportunity to re-engage the debate about the relative importance of individual and institutional factors in achievement by asking whether there are links between high school quality and collegiate performance.

Data and Methods

We use 10 years of administrative data for three Texas public universities that differ in the selectivity of their admissions. These include the two public flagships—the University of Texas at Austin (UT) and Texas A&M University (TAMU)—and the University of Texas-San Antonio (UTSA), which has relatively open admissions.[1] Administrative records for the three institutions include information about enrollment status along with students' class rank, senior class size, SAT scores, and an identifier indicating the high school attended.[2] Publicly available data from the Texas Education Agency (TEA) are used to stratify regular Texas public high schools for the years 1994-2003 according to the socioeconomic status of the students they serve.[3] For each regular public high school, TEA data indicate the total number of graduates in each year, as well as mean school SAT scores and the school-specific share of students ever

[1] The Texas Higher Education Opportunity Project (THEOP) collected these data (See http://www.texastop10.princeton.edu.) Files are available at the University of Michigan's Institute for Social Research.

[2] Applicant percentile rank is calculated using the actual class rank and senior class size. For UT-Austin, 2.8% of applicants' records lack precise class rank measures, but instead include an indicator of class rank within ranges. We smoothed these applicants into appropriate class rank ranges and would like to thank Mark Long (University of Washington) for generously sharing his Stata code to facilitate the interpolation.

[3] We use publicly available data from the National Center for Education Statistics (NCES) to identify special and alternative high schools, which are excluded from the analysis.

classified as economically disadvantaged.[4] These data are appended to student records using the high school identifier available in both the administrative and the TEA files.

Jencks and Mayer (1990) claim that high school economic mix is a reasonable proxy for school environment and college orientation. Therefore, to portray high school quality, we derive a tri-partite measure of economic disadvantage based on percent of students ever economically disadvantaged.[5] Because high school students eligible for free or reduced lunch may be disinclined to request the benefit in order to avoid public stigma, the TEA measure based on receipt of lunch subsidy over the full academic career is a better proxy for low income students than a current year measure for seniors. For each year in the observation period we classify regular Texas public high schools into three broad socioeconomic strata based on the share of students that were ever economically disadvantaged. High schools in the lowest quartile of students are designated *affluent*; those in the highest quartile are designated *poor*; and high schools in the middle quartiles are classified as *average (or typical)*. We make no presumption that school socioeconomic strata represent the status of individual students, but expect that academic preparation and college-linking activities will vary accordingly.

Table 1 shows how the three high school economic strata differ in their ethno-racial composition and three key indicators of college attendance, namely the percent that pass algebra; the share that take a college entrance exam; and conditional on doing so, the average test score. Consistent with prior studies, minority students are disproportionately represented in the poor schools, where Hispanics accounted for three-fourths of Texas high school students in 2002 but only 15 percent of affluent high schools. Statewide, Hispanic comprised over one-third of Texas

[4] The measure of students ever economically disadvantaged was provided in response to a specific request to the Texas Education Agency.

[5] This approach is consistent with Rutter's (1983) recommendation to focus on relative differences among schools based on their placement in a distribution rather mean differences that can obscure inequities within and between schools.

high school students.[6] Blacks also are underrepresented at affluent high schools; they represent about 13 percent of Texas public high school students, but approximately 9 of the student body at affluent high schools. The ethno-racial composition of high schools in the middle quartiles roughly approximates the Texas public high school student population except that African American students are slightly overrepresented relative to their statewide share and whites are slightly underrepresented at these schools. Tienda and Niu (2006) show that minority students' chances of qualifying for the admission guarantee based on class rank are higher at schools where they constitute a larger share of the population, but their enrollment likelihood is lower owing to financial and information about college options (Niu, et al., 2008).

(**Table 1 about Here**)

Arguments about differential college readiness based on high school socioeconomic status find support in the gradients of algebra completion and test taking behavior. Close to 60 percent of students attending affluent high schools pass algebra compared with just over one-third of their counterparts from poor high schools. A similar pattern obtains for taking standardized tests, which range from 75 percent of students from affluent high schools versus just over half of their counterparts attending poor schools. And, not surprisingly, the average test scores vary monotonically with the income composition of the student body, confirming Rothstein's (2004) claim that the test scores are a rough proxy for the high school's economic status. The last entry in Table 1 presents the ratio of graduates in 2002 to the number of 10^{th} graders in that year, which is a rough proxy for graduation rates. Not surprisingly, poor high schools feature the lowest graduation rates, but there is considerable heterogeneity within strata, as evident in the similar graduation rate for the average stratum.

[6] According to the Texas Public School Statistics, Pocked Edition, 2004-2006, Hispanics comprised 35 percent of public high school graduates, African Americans 13 percent, and Asian and other groups about 4 percent. Just under half of Texas public high school graduates were white (48 percent) in 2004, down from 56 percent a decade earlier.

Table 2 provides a distribution of the high school composition of freshmen enrolled at the three public universities of interest. For this tabulation we have disaggregated affluent and poor high schools further by separating "feeder" and "Longhorn/Century" high schools. The former are a subset of 28 high schools out of over 1400 public high schools that accounted for between 20-25 percent of admittees to the two public flagships as of 2000 (Niu and Tienda, 2010). Virtually all of the Longhorn/Century high schools fall into the lowest economic quartile; hence they sent relatively few if any students to the public flagships. The Longhorn and Century scholarship programs implemented by UT and TAMU, not only boost the number of students from low-income schools, but they also target the highest ranked graduates from these schools.[7]

(**Table 2 about Here**)

There is evidence that the high school composition of enrollees' changed after the uniform admission regime was implemented, but only slightly and not uniformly across institutions. At UT's Austin campus, the share of enrollees from affluent schools, including the historically dominant feeder high schools, dropped nearly two percentage points and enrollees from other affluent high schools fell an additional three points, mainly as a result of the institutional saturation with rank-eligible applicants from a growing number of high schools (Tienda and Sullivan, 2009). Enrollees from high schools classified in the second and third quartiles of the socioeconomic distribution, designated "typical" in Table 2, accounted for the largest increases in UT's freshman classes after the top 10% law went into effect. There was a modest change also in the representation of students from the Longhorn/Century high schools,

[7] Domina (2007) provides a detailed account of the Longhorn and Century Scholarship program. Classification of high schools is relatively stable over time, but owing to the rapid growth of the high school population during the observation period, some schools shifted between categories. The Longhorn/Century high schools do not change their designation, however, even if the dates of entry into the program differ.

which serve large numbers of low-income students, but some of this "increase" involved a shuffling of enrollees from the subset of poor schools not targeted for the fellowship program.

At TAMU the changes in the socioeconomic composition of sending high schools also favored the typical schools. By contrast to UT, where most of the increase in student enrollment from typical schools came at the expense of affluent high schools, at TAMU increased representation in students from average income high schools came at the expense of students from poor high schools, including the Longhorn/Century schools. Despite the intensive outreach to rank-eligible students from Century high schools, TAMU was less successful than UT attracting students from poor and minority high schools—at least through 2003, when our data series ended.

The saturation of UT-Austin with top 10% admits benefited UTSA in that its share of students from feeder high school students rose from three to 10 percent. Nevertheless, by comparison to the public flagships, UTSA enrolls a much larger share of students from poor high schools—roughly 30 percent both before and after the top 10% law went into effect. The main change is the slight dip in the share of students from Longhorn/Century high schools, possibly as the highest ranked graduates were lured away to the flagship campuses.

Given the observed changes in the socioeconomic composition of enrollees at the public flagships, it is conceivable that the black-white and Hispanic-white performance gaps will be impacted, particularly as larger numbers of students from low income schools enroll. Table 3, which reports sample characteristics of first-time freshman for each university and the three high school strata, confirms that nearly two thirds of UT enrollees from poor high schools are Hispanic. At TAMU, which draws its students from a broader geographic and socioeconomic spectrum owing partly to its land grant mission (Long, et al., 2010), nearly half of enrollees from

poor high schools are white. Less than 10 percent of enrollees at both UT and TAMU graduate from poor high schools, compared with UTSA, where one-fourth of the student body do so. Moreover, 80 percent of UTSA students who graduated from poor high schools are Hispanic, but among UTSA enrollees who attended affluent high schools, nearly two-thirds are white.

(Table 3 about Here)

These differences in the socioeconomic composition of high school feeding patterns likely influence minority achievement gaps at the postsecondary level. In fact, Table 3 shows monotonic variation in average 1st and 6th semester grade point averages according to the quality of high school attended. Grade point levels tend to be higher at UT, the most selective institution, and lowest at UTSA, the least selective, where students from poor high schools did not earn a C-average during their first semester. Similar differentials obtain for 6th semester GPA, except that the point averages are higher, most likely due to selective attrition of the weaker students and potentially differential course portfolios from selection into chosen majors. At UT and TAMU, four-year graduation rates vary directly with the quality of high school attended, but not at UTSA, where the likelihood of graduating in four years averages five percent, irrespective of high school quality. This measure combines three different groups of students: those who transferred to other institutions; those who have withdrawn; and those who are still pursuing their studies.[8] Transfers and delayed completion rates are particularly problematic for UTSA, both because a higher share of students attend part-time and because transfers to more selective institutions maybe considered a positive outcome. Both transfers and part time attendance make interpretation of UTSA graduation rate problematic; therefore analyses of 4-year completion rates focus on UT and TAMU.

[8] Because many students take time off, or are required to extend their studies for additional semesters when they change majors or to fulfill specific requirements, most reports use the 6-year graduation rate.

Modeling Strategy

To address whether the types of high schools that minority students attend contribute to college achievement disparities, we evaluate three measures of academic performance, namely first and sixth semester grades and four-year graduation rates for students who attended affluent, average, and poor high schools. In particular, we estimate a standard production function that specifies college achievement outcomes as determined by individual, family and school-level inputs:

$$outcome_{iut} = \beta X_{ist} + \alpha U + \tau_t + \varepsilon_{iut} \quad (1)$$

where an educational outcome for student *i* at university *u* at time *t* is determined by the student's demographic and background characteristics (*X*), university characteristics (*U*) and an idiosyncratic error term. In order to control for secular trends in the freshman class, university grading standards, etc., we also control for year fixed effects, τ_t. Institution-specific estimates obviate the need to control for institutional characteristics, *U*. For all specifications, the estimated β coefficients for student racial background represent institution-specific racial disparities in college achievement:

$$outcome_{iut} = \beta_u X_{ist} + \tau_t + \varepsilon_{iut} \quad (2)$$

Furthermore, we estimate variants of (3) to assess whether high schools attended influence race and ethnic differences in college achievement.

$$outcome_{ist} = \beta X_{ist} + S_s + \tau_t + \varepsilon_{ist} \quad (3)$$

This specification models all time-invariant characteristics of each student's high school, denoted by (*s*), to control for school-specific differences ("fixed effects"). Results for equation (3) indicate whether racial disparities in college achievement exist for students who attended the

same high school. That is, we use a within-high-school-of-origin estimator for racial gaps in college achievement, where the coefficient of interest is only identified by within-high school disparities in college performance between individuals of different race/ethnicity who attended the same high school.[9]

The high school fixed effects models compare students from the same high school, but do not reveal whether differentials are similar among rich and poor high schools. The considerable ethno-racial heterogeneity within socioeconomic strata, which is portrayed in Table 3, warrants further refinement to determine whether and in what ways school quality contributes to racial and ethnic disparities in collegiate achievement. Therefore, we stratify the sample into three types of high schools based on the level of school-resources and re-estimate equation (3). This allows the coefficients of interest, β, to vary by high school quality; substantively this refinement addresses whether the estimated ethno-racial gaps among students who attend *the same high schools* differ according to the resource level of their high schools.

Multivariate Results

Tables 4-6 report estimates of race and ethnic differences in first semester grades, sixth semester grades and 4-year graduation, respectively, based on equation (3) for students enrolled at each university. All specifications include standardized test scores and class rank, as well as year fixed effects to monitor annual variation in grading and freshmen class attributes such as those produced by changes in admission criteria.[10] The point estimates compare blacks and

[9] A complementary approach to the method of using high school fixed effects would be to measure and examine the predictors of school-specific race gaps (Stiefel et al. 2007).

[10] Even before the top 10% law was passed, students who graduated in the top decile of their class had their admission to UT and TAMU virtually guaranteed. The law converted a de facto standard to a de jure criterion, but also changed the high school sending patterns. Although standardized test scores were not considered in the admission decision of top 10% graduates after 1997, all students were required to submit the scores for an

Hispanics who were freshmen in a particular year with white students *from the same high school*. Thus, the fixed effects specification captures variation in curricula, college orientation of the school, sports activities, and physical resources across schools, but not individual experiences with college guidance or sports activities.[11]

The fixed effects specifications presented in Table 4 concur with Fletcher and Tienda's finding that minority students at UT outperform their white counterparts who graduated from the same high school, but also reveal that race and ethnic gaps in freshman grades differ by school quality. Both Asian and Hispanic freshmen graduates from poor high schools average higher 1st semester GPA's compared with their white high school classmates, but no comparable advantage obtains for black students who attend poor high schools, most likely because the low quality schools blacks attend have few whites. On average, students from poor high schools represent less than 10 percent of UT's freshman classes, nearly two-thirds of these Hispanic (Table 3). Among graduates from affluent high schools, Hispanic and black UT freshmen also outperform their white same-school classmates, but Asian freshmen achieve grade point averages comparable to their white classmates. These findings not only support claims that high school quality contributes to postsecondary achievement gaps, but also suggest that the minority students from poor schools are highly selective on unobservable attributes like motivation. Asian and African American graduates from typical Texas high schools also outperform their white same-school classmates. Thus, at UT it appears that based on first semester grades students from poor high schools do not underperform academically.

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application to be considered complete. Schools could establish criteria for ranking students, but not the cut-points or rounding. To avoid gaming, schools were required to submit the number of students and the exact ranking, which we used in deriving the class rank distribution.

[11] One caveat is that the coefficients are only identified using high schools that send multiple students to a particular institution and where the race and ethnic background of the students differs. Fletcher and Tienda conducted a sensitivity analysis restricting the sample to high schools that send students from multiple race groups and concluded that the results were robust. However, we will conduct the robustness test for the strata-specific estimates in the future.

(**Table 4 about Here**)

Results for TAMU parallel those of UT, with several notable differences. Like UT, grade point gaps for TAMU's Asian and Hispanic freshmen from poor high schools are smaller than those of their counterparts who attended affluent high schools. The important difference is that Asians outperform their white high school classmates, but Hispanics achieve lower grades than their white classmates.[12] Still, among graduates from poor high schools, the Hispanic-white grade point gap is smaller than their ethnic counterparts who attended affluent high schools. Surprisingly, African American TAMU freshmen from both affluent and typical high schools outperform their same-school classmates during their first semester by .08 to .11 grade points, respectively. Only two percent of black TAMU freshmen hail from affluent high schools, but they appear to be highly motivated to succeed academically.[13]

UTSA provides a stark comparison to the public flagships both in its nonselective admissions and the socioeconomic composition of its student body. The fixed-effects estimates reveal very little evidence of minority achievement gaps, but there is evidence that both Hispanic and to a lesser extent black freshmen from poor high schools achieve higher first semester grades than their same-school white classmates. Fletcher and Tienda's (2010) pooled estimates showed no race gap in first semester grades once school-fixed-effects were modeled, and a .05 Hispanic advantage across all schools. Our strata-specific analyses reveal that the average Hispanic and black freshman achievement advantages derive mainly from the superior performance of students from poor high schools, who comprise nearly one quarter of the student body.

[12] The large point estimate for Asians warrants caution because it is based on a relatively small number of students—less than 1 percent of all graduates from poor high schools attending TAMU are Asian.
[13] We have no way of knowing whether any of the students or their parents are foreign-born, which in the case of African Americans often involves students with highly educated parents rather than under-represented minorities. Most Caribbean populations settle in the northeast or southeast, so this potential bias is likely to be small.

Sustaining the achievement advantages through the college career is essential for changing the ethnic composition of college graduates. To the extent that attrition is driven by withdrawal of academically weaker students, those who persist through the third year of study are presumably adequately equipped to complete their course of study. A sensitivity analysis confirmed that students with higher grade point averages are less likely to withdraw before their 6th semester, but attrition is not uniform across demographic groups and neither is academic performance in more advanced courses, as Table 5 shows.

Apparently drive and motivation cannot compensate for weak academic preparation as courses become more advanced, as evident in the erosion of the freshman minority advantages. The magnitude of the resulting grade gap differs by group and high school quality. By their third year of college, UT Hispanic students from poor high schools achieve *lower* grades than their white classmates as a result of an average grade point erosion of .15 points (-.07 - .08) over the next five semesters. Hispanic students from affluent schools also witness a reversal of academic fortunes vis-à-vis their same high school white classmates, but the average change was much smaller—only .06 points. Black UT students also experience grade erosion over the next five semesters, but the magnitude of their achievement gap relative to their white high school classmates is similar for both graduates of poor and affluent high schools. Even Asian students lost their grade point advantages relative to their white high school classmates by the end of their 6th college semester; moreover, Asians who graduated from affluent schools averaged grades .06 points *below* their same-school classmates.

(**Table 5 about Here**)

At TAMU black students also earned GPA's between .05 and .09 points below their white high school classmates after three years of study, irrespective of the quality of their high

school. The grade erosion for blacks was most pronounced for graduates from affluent and typical schools, where they initially outperformed their white classmates. However, TAMU's Hispanic-white achievement gap does not widen by the third year of study, and students from average schools manage to narrow the gap modestly. That Hispanics comprise less than 10 percent of TAMU's students who attended typical high schools suggests considerable heterogeneity among the white students at these schools. GPA's of Asian students from affluent high schools are below their same-school white classmates by the sixth semester, but graduates from poor schools lost their grade-point advantage over their white classmates. The latter result likely reflects selective attrition of the weakest students from both groups.

At UTSA there are no discernible achievement gaps by the end of the 6th semester. As a nonselective commuter institution, UTSA has some of the highest attrition rates in the UT system. The number of high schools represented in the first semester (Table 4) and sixth semester (Table 5) reveals how attrition differs according to high school quality. Not only did the number of high schools represented among the junior class drop by 24, 30 and 20 percent, respectively, for students who attended affluent, average and poor schools, respectively, but shrinkage in the cohort sizes was a whopping 69 to 72 percent over the next five semesters. Even though many students at UT and TAMU had withdrawn by their 6th semester, attrition was not disproportionate by high school quality. At least one student from each poor high school that sent students to UT remained enrolled through their 6th semester, and only three of the poor schools that sent students to TAMU were no longer represented by the 6th semester. This indicates greater power to hold students from poor high schools at the more selective institutions, which is

consistent with findings from several studies showing that persistence and graduation rates are higher at the more selective institutions (Alon and Tienda, 2005; Bowen and Bok, 1998).[14]

Differential attrition by institutional selectivity and demographic group is also evident in the four-year graduation rates, which range from 22 to 38 percent, depending on high school economic status (see Table 3).[15] Despite persisting minority-white 6th semester grade gaps among UT and TAMU juniors who attended poor high schools, somewhat surprisingly, these disparities do not carry over to four-year graduation rates at either flagship. One plausible explanation is that graduation rates are equally low for all groups, but an alternative is that minority students who graduate in four years earn lower grade point averages. Without additional information based on cohort graduation rates, which are not available due to right censoring, we cannot evaluate this possibility.

(**Table 6 about Here**)

By contrast, among students who attended affluent and average high schools, four-year graduation rates differ along race and ethnic lines at both flagships. Black students who attended affluent high schools are five (TAMU) to eight (UT) percentage points less likely than their white high school classmates to graduate in four years. Hispanic students from affluent high schools also are less likely to graduate in four years compared with their white classmates, but the differential is lower—approximately three percentage points at both flagships. The Asian-white graduation disparity is intermediate between Hispanic and black students who attended

[14] Fletcher and Tienda (2010) examined choice of major as a potential avenue through which grade point gaps widen after the freshman year. They detected little evidence that black and Hispanic students sort into majors in ways that accentuate achievement gaps at the public flagships, but there is suggestive evidence that major choices accentuate race and ethnic grade gaps at UTSA.

[15] Data censoring precludes analysis of 6-year graduation rates for all but a few cohorts; therefore we analyze 4-year graduation rates mainly to illustrate the large variation by institutional selectivity. We exclude UTSA from the graduation analyses.

affluent high schools, but only reaches statistical significance at UT. In part this reflects the large heterogeneity of UT's Asian students, who comprise 21 percent of first-time freshmen from affluent high schools. Only four percent of TAMU's freshmen from affluent high schools are Asian.

Four-year graduation disparities between minority and white students from typical high schools also emerge at both flagships. Black and Hispanic students from average high schools are between four and five percentage points less likely than their white high school classmates to graduate from UT in four years, and at TAMU Hispanics are six percentage points less likely to do so. Many of these students will eventually graduate but some will not, but it remains to be seen whether high school quality also influences the likelihood of ever graduating.

Conclusions

Using a fixed-effects modeling strategy, we examine how class stratification of secondary schools reproduces academic disparities at the postsecondary level. Our analyses generated a plethora of specific results, but three generalizations capture the main story. First, attending an affluent high school *does not* insulate minority students from achievement disparities vis-à-vis their same school minority classmates beyond the first semester; however, this generalization only obtains for selective institutions. Furthermore, during the first semester, students who attended poor high schools often *outperform* their white classmates by a larger grade point margin than their race counterparts who attended affluent or poor high schools.

Second, high school influences on academic achievement carry over through the college career at least through 4-year graduation, but only at selective institutions. Our results show that the Hispanic-white and black-white performance advantages evident in first semester grades dissipate by their 6^{th} semester. With one exception, the modest minority-white grade point

disparities indicate that graduates from poor high schools who enroll in college are not necessarily ill prepared for post-secondary training relative to their race and ethnic counterparts who attended affluent or typical high schools. However, the sizable black-white 6th semester achievement disparities at UT warrant concern, both because they obtain across the three high school strata and because they may undermine eventual graduation prospects. What is unclear, however, is whether the absence of graduation achievement gaps among students from poor high schools simply means that both minority and nonminority students have very low prospects of graduating or that selective attrition equalizes by eliminating the weak students.

Third, the character of "typical" high schools warrants further examination. By definition, these schools are more heterogeneous along economic lines, and other dimensions as well, such as size, geographic location and ethno-racial composition. These three traits are likely related to curriculum and hence college performance in ways that the fixed-effect estimation strategy cannot disclose. That the two public flagships draw unequally from this pool of students may partly explain why race and ethnic disparities are somewhat difficult to characterize—sometimes intermediate between affluent and poor schools, but often not.

Although our tri-partite typology of school quality is crude, it resonates with the college-linking strategies outlined by Hill that differentiated among traditional, clearinghouse and brokering approaches. The institutional policy question centers around the value of broadening economic diversity, which is becoming more difficult as the sticker price of college continues to soar. Our analyses address this question through the lens of ethnic and racial achievement disparities, which remain tightly coupled with economic resources. If the goal is weakening the reproduction of class inequality through postsecondary educational opportunities, the answer is yes, provided that support mechanisms to narrow achievement gaps are also put into place.

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Table 1

High School Characteristics by Economic Strata, 2002

(Means or Percent)[a]

	School Economic Strata		
	Affluent	Average	Poor
Composition			
% Black	8.8	16.7	14.3
% Hispanic	15.0	31.8	74.7
% Asian	5.2	2.6	0.8
% White	71.0	48.9	10.2
% Pass H.S. Algebra	58.8	45.7	34.4
(SD)	(18.7)	(18.7)	(18.8)
% Take SAT	75.2	60.5	53.0
(SD)	(12.7)	(14.3)	(16.6)
$\bar{x}$ SAT/Taking	1037.8	976.4	863.0
(SD)	(53.3)	(68.6)	(73.9)
Ratio $\frac{\text{Graduates}}{\text{10th Graders}}$	0.818	0.744	0.719
(SD)	(.089)	(.129)	(.231)
N	268	537	268

Source: Texas Education Agency, Special Tabulation

[a] Weighted by size of High School

Table 2

Distribution of First Time Freshmen by Type of Public High School School Attended and Period: Three Texas Public Universities

(In Percent)

	UT		TAMU		UTSA	
	Pre-97	Post-97	Pre-97	Post-97	Pre-97	Post-97
Feeder	29.9	28.1	19.2	19.2	6.4	9.8
Affluent	36.2	33	38.6	37.4	37.6	33.0
Typical	22.8	26.8	29.2	33.7	26.4	28.0
Poor	7.0	6.7	8.1	6.0	19.3	19.9
Longhorn/Century	4.1	5.1	4.9	3.7	10.4	9.2
Total	100	100	100	100	100	100
N	15,231	36,212	15,298	28,774	4,141	15,171

Source: THEOP Administrative Data

Table 3

Sample Characteristics of First Time Freshmen by Type of Public High School attended: Three Texas Public Universities

	UT-Austin			Texas A&M			UT-San Antonio		
	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Composition (proportions)									
Hispanic	0.08	0.17	0.63	0.06	0.09	0.44	0.26	0.40	0.80
Black	0.03	0.07	0.06	0.02	0.05	0.05	0.05	0.07	0.04
White	0.69	0.64	0.25	0.86	0.82	0.48	0.62	0.48	0.14
Asian	0.21	0.11	0.06	0.04	0.03	0.01	0.07	0.04	0.02
1st Semester GPA	2.99	2.76	2.62	2.80	2.64	2.44	2.23	2.08	1.85
(s.d.)	(0.84)	(0.90)	(0.93)	(0.77)	(0.80)	(0.83)	(1.08)	(1.07)	(1.07)
6th Semester GPA	3.06	2.94	2.79	2.99	2.91	2.78	2.54	2.51	2.43
(s.d.)	(0.56)	(0.57)	(0.58)	(0.53)	(0.53)	(0.52)	(0.66)	(0.65)	(0.62)
4 Year Graduation Rate	0.38	0.29	0.22	0.33	0.30	0.22	0.06	0.05	0.04
(s.d.)	(0.49)	(0.45)	(0.41)	(0.47)	(0.46)	(0.41)	(0.23)	(0.22)	(0.20)
Test Score	1222.56	1166.89	1081.85	1176.65	1130.16	1070.64	1021.37	982.68	915.68
(s.d.)	(133.92)	(141.39)	(145.30)	(131.99)	(138.19)	(136.69)	(136.94)	(135.31)	(126.94)
Rank	83.93	89.11	91.91	84.20	89.20	90.96	59.56	67.66	77.26
(s.d.)	(14.02)	(10.63)	(8.65)	(12.92)	(9.95)	(8.98)	(21.34)	(20.81)	(18.55)
n of students	46078	17920	6482	33108	18893	4804	9301	5257	5436
Proportion of university total	0.60	0.23	0.08	0.54	0.31	0.08	0.41	0.23	0.24

Source: THEOP Administrative Data

Table 4
Determinants of First Semester GPA with High School Fixed Effects:
Three Texas Public Universities, Stratifed by High School Poverty

Institution & Years	UT-Austin 1990 2001			TAMU 1992-2002			UTSA 1995-2003		
H.S. Strata	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Male	-0.110***	-0.112***	-0.145***	-0.038***	-0.039***	-0.033	-0.054**	-0.023	-0.086***
	(0.007)	(0.012)	(0.022)	(0.008)	(0.011)	(0.022)	(0.022)	(0.031)	(0.030)
Black	**0.053****	**0.060****	-0.056	**0.076*****	**0.109*****	0.047	0.048	0.030	0.164*
	(0.021)	(0.026)	(0.066)	(0.026)	(0.029)	(0.068)	(0.049)	(0.062)	(0.089)
Hispanic	**0.030****	0.026	**0.083*****	**-0.094*****	**-0.093*****	**-0.069****	0.038	0.046	**0.095****
	(0.013)	(0.018)	(0.032)	(0.015)	(0.020)	(0.029)	(0.025)	(0.035)	(0.048)
Asian	0.002	**0.070*****	**0.111****	-0.008	0.002	**0.230****	0.050	0.040	0.119
	(0.009)	(0.020)	(0.054)	(0.018)	(0.032)	(0.095)	(0.043)	(0.074)	(0.123)
Class Rank	0.029***	0.035***	0.035***	0.026***	0.030***	0.027***	0.024***	0.022***	0.023***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Test Score (SAT/ACT)	0.105***	0.124***	0.137***	0.098***	0.114***	0.132***	0.076***	0.109***	0.146***
	(0.003)	(0.005)	(0.009)	(0.003)	(0.004)	(0.009)	(0.009)	(0.013)	(0.013)
Constant	-0.723***	-1.754***	-1.976***	-0.669***	-1.310***	-1.289***	-0.061	-0.518***	-1.417***
	(0.037)	(0.073)	(0.151)	(0.038)	(0.061)	(0.136)	(0.090)	(0.131)	(0.136)
Observations	45576	18479	6082	33103	18891	4804	7667	4194	4478
R-squared	0.33	0.26	0.20	0.27	0.23	0.19	0.26	0.20	0.20
Number of high schools	254	406	176	269	504	235	169	207	163

Note: ***1%, **5%, *10%, All Models include year fixed effects.

Source: THEOP Administrative Data

Table 5

Determinants of Sixth Semester GPA with High School Fixed Effects:

Three Texas Public Universities, Stratifed by High School Poverty

Institution & Years	UT-Austin 1991-2000			TAMU 1992-2002			UTSA 1995-2001		
H.S. Strata	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Male	-0.135***	-0.157***	-0.145***	-0.109***	-0.113***	-0.095***	-0.142***	-0.079**	-0.079**
	(0.005)	(0.010)	(0.018)	(0.006)	(0.008)	(0.016)	(0.027)	(0.035)	(0.034)
Black	**-0.122*** **	**-0.102*** **	**-0.117** **	**-0.046** **	**-0.058*** **	**-0.086* **	-0.036	-0.125*	-0.018
	(0.017)	(0.022)	(0.051)	(0.020)	(0.021)	(0.051)	(0.060)	(0.072)	(0.098)
Hispanic	**-0.030*** **	**-0.034** **	**-0.074*** **	**-0.092*** **	**-0.072*** **	**-0.092*** **	-0.024	0.005	-0.035
	(0.010)	(0.015)	(0.025)	(0.011)	(0.015)	(0.021)	(0.031)	(0.039)	(0.055)
Asian	**-0.056*** **	-0.001	-0.019	**-0.034** **	-0.016	-0.005	-0.025	-0.084	-0.110
	(0.007)	(0.016)	(0.039)	(0.013)	(0.024)	(0.065)	(0.055)	(0.076)	(0.135)
Class Rank	0.019***	0.020***	0.020***	0.019***	0.021***	0.020***	0.015***	0.013***	0.014***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Test Score (SAT/ACT)	0.070***	0.096***	0.103***	0.073***	0.093***	0.100***	0.043***	0.100***	0.083***
	(0.002)	(0.004)	(0.007)	(0.002)	(0.003)	(0.007)	(0.011)	(0.014)	(0.014)
Constant	0.541***	-0.098*	-0.191	0.480***	-0.088*	-0.035	1.210***	0.733***	0.611***
	(0.030)	(0.059)	(0.121)	(0.028)	(0.045)	(0.106)	(0.108)	(0.145)	(0.161)
Observations	32659	11516	3745	27778	15088	3500	2082	1279	1386
R-squared	0.33	0.28	0.23	0.31	0.28	0.24	0.25	0.23	0.18
Number of high schools	258	387	176	266	500	232	128	144	130

Note: ***1%, **5%, *10%, All Models include year fixed effects.

Source: THEOP Administrative Data

Table 6

Determinants of 4 Year Graduation with High School Fixed Effects:

Three Texas Public Universities, Stratifed by High School Poverty

Institution & Years	UT-Austin 1990-2000			TAMU 1992-2000			UTSA 1996-2000		
H.S. Strata	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Male	-0.127***	-0.123***	-0.108***	-0.205***	-0.208***	-0.180***	-0.030***	-0.028***	-0.010
	(0.005)	(0.007)	(0.012)	(0.006)	(0.007)	(0.013)	(0.008)	(0.010)	(0.008)
Black	**-0.078*** **	**-0.053*** **	-0.026	**-0.049** **	-0.008	-0.017	0.005	-0.008	0.024
	(0.015)	(0.016)	(0.033)	(0.020)	(0.019)	(0.041)	(0.017)	(0.019)	(0.023)
Hispanic	**-0.026*** **	**-0.039*** **	-0.016	**-0.034*** **	**-0.063*** **	-0.027	-0.007	0.001	0.003
	(0.009)	(0.011)	(0.016)	(0.012)	(0.013)	(0.017)	(0.009)	(0.010)	(0.012)
Asian	**-0.049*** **	-0.002	0.037	-0.007	0.005	0.070	0.032*	-0.011	-0.020
	(0.007)	(0.013)	(0.027)	(0.014)	(0.022)	(0.054)	(0.017)	(0.024)	(0.034)
Class Rank	0.007***	0.007***	0.006***	0.006***	0.007***	0.006***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Test Score (SAT/ACT)	0.011***	0.016***	0.028***	0.013***	0.020***	0.023***	0.004	0.012***	0.007**
	(0.002)	(0.003)	(0.005)	(0.002)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)
Constant	-0.417***	-0.544***	-0.585***	-0.291***	-0.465***	-0.550***	-0.063**	-0.136***	-0.113***
	(0.026)	(0.043)	(0.071)	(0.029)	(0.041)	(0.079)	(0.028)	(0.037)	(0.033)
Observations	37641	14425	5046	26843	15084	4011	4066	2562	3013
R-squared	0.10	0.09	0.07	0.10	0.11	0.09	0.03	0.03	0.02
Number of high schools	263	403	186	262	498	229	162	204	163

Note: ***1%, **5%, *10%, All Models include year fixed effects.

Source: THEOP Administrative Data

Appendix Table 4a
Determinants of First Semester GPA without High School Fixed Effects:
Three Texas Public Universities, Stratifed by High School Poverty

Institution & Years	UT-Austin 1990 2001			TAMU 1992-2002			UTSA 1995-2003		
H.S. Strata	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Male	-0.158***	-0.146***	-0.167***	-0.097***	-0.069***	-0.059***	-0.117***	-0.107***	-0.117***
	(0.007)	(0.012)	(0.022)	(0.008)	(0.011)	(0.022)	(0.022)	(0.032)	(0.030)
Black	-0.051**	0.032	-0.140***	-0.034	-0.042*	-0.190***	0.013	0.002	0.133
	(0.021)	(0.025)	(0.050)	(0.025)	(0.025)	(0.051)	(0.048)	(0.061)	(0.083)
Hispanic	-0.008	0.041**	0.089***	-0.123***	-0.140***	-0.153***	-0.010	0.001	0.084*
	(0.013)	(0.017)	(0.027)	(0.015)	(0.018)	(0.023)	(0.025)	(0.033)	(0.046)
Asian	0.059***	0.125***	0.136***	0.013	-0.038	0.125	0.197***	0.131*	0.069
	(0.008)	(0.019)	(0.047)	(0.018)	(0.031)	(0.092)	(0.042)	(0.073)	(0.122)
Class Rank	0.022***	0.027***	0.032***	0.019***	0.025***	0.024***	0.018***	0.015***	0.019***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Test Score (SAT/ACT)	0.158***	0.167***	0.156***	0.152***	0.137***	0.150***	0.125***	0.188***	0.168***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.004)	(0.009)	(0.009)	(0.012)	(0.012)
Constant	-0.851***	-1.619***	-1.923***	-0.625***	-1.213***	-1.285***	-0.201**	-0.766***	-1.386***
	(0.039)	(0.076)	(0.148)	(0.039)	(0.060)	(0.134)	(0.091)	(0.130)	(0.135)
Observations	46058	17910	6478	33103	18891	4804	7667	4194	4478
R-squared	0.299	0.239	0.200	0.237	0.219	0.198	0.230	0.175	0.186

Note: ***1%, **5%, *10%, All Models include year fi

Source: THEOP Administrative Data

Appendix Table 5a

Determinants of Sixth Semester GPA without High School Fixed Effects:

Three Texas Public Universities, Stratifed by High School Poverty

Institution & Years	UT-Austin 1991-2000			TAMU 1992-2002			UTSA 1995-2001		
H.S. Strata	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Male	-0.162***	-0.174***	-0.161***	-0.142***	-0.129***	-0.102***	-0.167***	-0.134***	-0.117***
	(0.005)	(0.010)	(0.017)	(0.006)	(0.008)	(0.016)	(0.027)	(0.034)	(0.032)
Black	-0.171***	-0.146***	-0.182***	-0.103***	-0.152***	-0.196***	-0.026	-0.183***	-0.079
	(0.016)	(0.020)	(0.042)	(0.019)	(0.018)	(0.038)	(0.057)	(0.065)	(0.088)
Hispanic	-0.055***	-0.045***	-0.078***	-0.109***	-0.108***	-0.149***	-0.057*	-0.034	-0.022
	(0.010)	(0.013)	(0.021)	(0.012)	(0.013)	(0.017)	(0.030)	(0.036)	(0.051)
Asian	-0.029***	0.012	0.008	-0.022	-0.052**	-0.052	-0.012	-0.056	-0.144
	(0.007)	(0.015)	(0.035)	(0.013)	(0.023)	(0.061)	(0.052)	(0.073)	(0.130)
Class Rank	0.009	-0.095	0.095	-0.071***	-0.062*	-0.034	-0.008	-0.186	-0.201
	(0.043)	(0.075)	(0.193)	(0.025)	(0.036)	(0.072)	(0.222)	(0.261)	(0.407)
Test Score (SAT/ACT)	0.014***	0.016***	0.018***	0.014***	0.018***	0.017***	0.012***	0.009***	0.013***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.103***	0.118***	0.112***	0.105***	0.106***	0.111***	0.061***	0.139***	0.098***
	(0.002)	(0.004)	(0.007)	(0.002)	(0.003)	(0.006)	(0.011)	(0.013)	(0.013)
Observations	32659	11516	3745	27778	15088	3500	2082	1279	1386
R-squared	0.33	0.28	0.23	0.31	0.28	0.24	0.25	0.23	0.18
Number of high schools	258	387	176	266	500	232	128	144	130

Note: ***1%, **5%, *10%, All Models include year fixed effects.

Source: THEOP Administrative Data

Appendix Table 6a

Determinants of 4 Year Graduation without High School Fixed Effects:

Three Texas Public Universities, Stratifed by High School Poverty

Institution & Years	UT-Austin 1990-2000			TAMU 1992-2000			UTSA 1996-2000		
H.S. Strata	Affluent	Average	Poor	Affluent	Average	Poor	Affluent	Average	Poor
Male	-0.143***	-0.126***	-0.111***	-0.216***	-0.213***	-0.185***	-0.032***	-0.025***	-0.016**
	(0.005)	(0.007)	(0.011)	(0.006)	(0.007)	(0.013)	(0.007)	(0.009)	(0.008)
Black	-0.105***	-0.071***	-0.072***	-0.067***	-0.063***	-0.087***	0.006	-0.001	0.031
	(0.015)	(0.015)	(0.027)	(0.018)	(0.017)	(0.029)	(0.016)	(0.018)	(0.021)
Hispanic	-0.046***	-0.047***	-0.011	-0.045***	-0.086***	-0.063***	-0.005	0.004	0.010
	(0.009)	(0.010)	(0.014)	(0.011)	(0.012)	(0.013)	(0.008)	(0.009)	(0.011)
Asian	-0.030***	0.005	0.023	0.003	-0.015	0.039	0.033**	-0.004	-0.017
	(0.006)	(0.012)	(0.024)	(0.013)	(0.021)	(0.051)	(0.017)	(0.023)	(0.033)
Class Rank	-0.041	-0.087*	-0.099	-0.044*	-0.053*	0.011	0.119**	-0.050	-0.049
	(0.037)	(0.051)	(0.125)	(0.024)	(0.031)	(0.059)	(0.053)	(0.066)	(0.078)
Test Score (SAT/ACT)	0.005***	0.006***	0.005***	0.005***	0.006***	0.006***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Constant	0.030***	0.024***	0.030***	0.024***	0.025***	0.027***	0.005	0.015***	0.011***
	(0.002)	(0.003)	(0.004)	(0.002)	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)
Observations	37641	14425	5046	26843	15084	4011	4066	2562	3013
R-squared	0.10	0.09	0.07	0.10	0.11	0.09	0.03	0.03	0.02
Number of high schools	263	403	186	262	498	229	162	204	163

Note: ***1%, **5%, *10%, All Models include year fixed effects.

Source: THEOP Administrative Data