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Postsecondary Access, Persistence, and Completion of Houston-area Youth

Executive Summary

Pedro Reyes
Celeste Alexander
Matt Giani

The University of Texas at Austin

Acknowledgements

The Texas Education Research Center (TERC) is located at The University of Texas at Austin. The TERC is an independent, non-partisan, and non-profit organization focused on generating data-based solutions for Texas education and workforce demands. The goal of the TERC is to supply policymakers, opinion leaders, the media, and the general public with academically sound research surrounding today's critical education issues.

Texas Education Research Center
The University of Texas at Austin
Department of Educational Administration, SZB 310
Austin, TX 78712
Phone: (512) 471-4528
Fax: (512) 471-5975
Website: www.utaustinERC.org

Contributing Authors:
Pedro Reyes, Celeste Alexander, Matt Gianni

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Houston Endowment Inc., 600 Travis, Suite 6400, Houston, Texas 77002,
Phone: 713.238.8100

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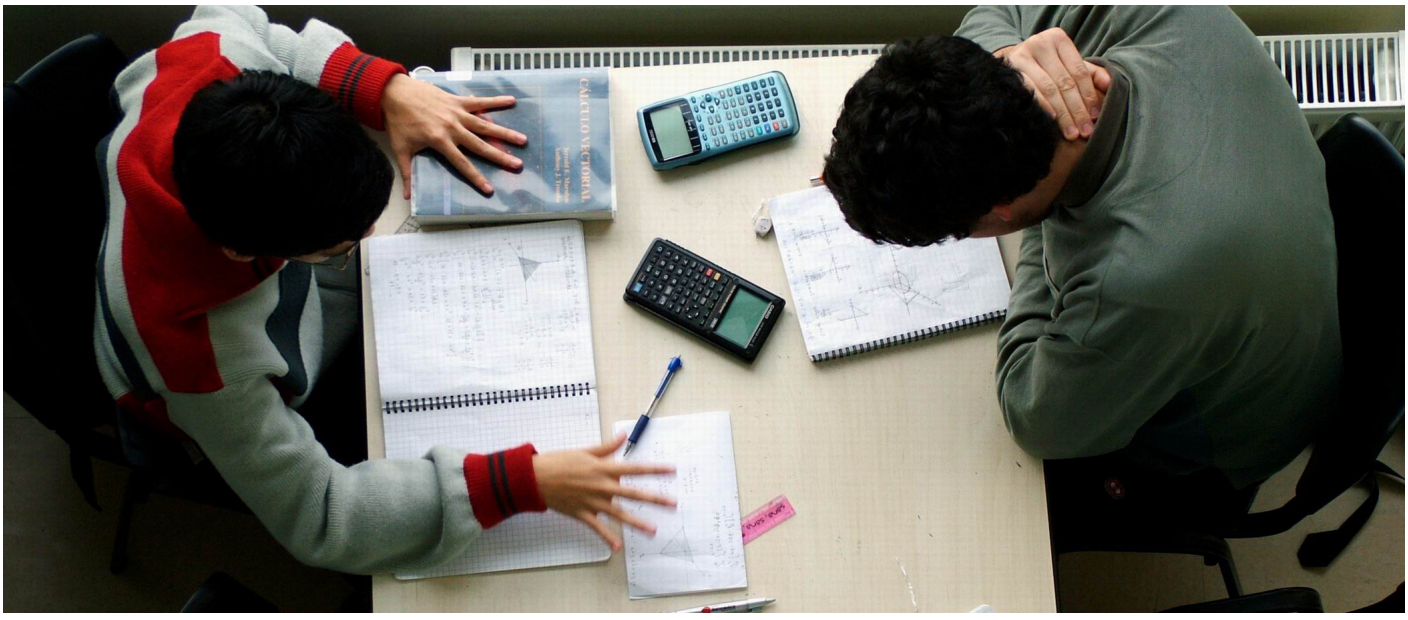


Introduction

Given the rapidly changing nature of the global economy, with its emphasis on information and technology, there is growing consensus among policymakers, the business community, and educational leaders that post secondary entrance and completion is the key to future economic and societal wealth in the United States. As a result, the nation is seeing an increased focus and effort to adequately prepare high school students, especially those students whose communities are historically underrepresented at colleges and universities, to be successful in post secondary education, whether it is a technical degree or a 2- or 4-year college degree.

The State of Texas has recently implemented several initiatives designed to strengthen the college readiness of its high school graduates as well as increase the number of post-secondary degrees awarded in the state. The Texas Higher Education Coordinating Board (THECB) adopted *Closing the Gaps, 2015* in October of 2000 (THECB, 2000). This higher education plan outlines the goals of significantly reducing many of the racial disparities in higher education participation and success. The ambitious plan proposed to significantly overhaul higher education in Texas by 2015. The report argued that stagnant college attendance and completion rates would soon produce an under-educated workforce unable to support a growing state economy (THECB, 2005). By the 2015 deadline, the initiative proposes to expand post-secondary enrollment in Texas by 630,000 and increase the number of post-secondary degrees awarded by 210,000. *Closing the Gaps* represents an overhaul to the Texas education system with a broad set of goals geared towards increasing college attendance and completion.

The goals of these reforms hold the potential to ensure the continued growth of the Texas economy through maintaining a supply of highly qualified workers capable of meeting the demands of the 21st Century labor market. Indeed, in a recent study estimating the potential economic benefits *Closing the Gaps* reforms could have on the state, the Perryman Group concluded that the economic gains associated with a more educated work force amount to $200 billion per year in incremental gross product and more than 1 million additional jobs (Perryman Group, 2007). By understanding the types of schools and districts that provide strong structures of support to encourage skills and aspirations for a college-going culture, we can better equip high school students to access postsecondary institutions and meet these 21st-century challenges.

In light of the significant steps being taken at the federal and state level to strengthen the college and career readiness of public high school graduates, the Houston Endowment Inc, a philanthropic organization serving the greater Houston area, commissioned The University of Texas at Austin Education Research Center (TERC) in 2008 to conduct a longitudinal study of state and Houston area public school students.

This current report focuses on four primary categories of research questions: 1) Who persists through high school; 2) Who gains access to postsecondary institutions and why; 3) Who persists through college and why, and; 4) Who eventually completes their post secondary education and earns some type of degree or certificate and why? In order to address these sets of questions this report focuses on two separate cohorts of Texas students. Students in the first cohort were high school freshman in the school year 2003-04, while students in the second cohort were high school seniors in the 2003-04 school year. As we began following Cohort 1 students in their freshman year, this cohort was studied to determine their high school persistence patterns, their initial college access rates, and the factors that predicted access to postsecondary institutions. Because the second cohort of students graduated from high school in 2004 and had thus been out of high school for six years at the time of this study, this cohort was analyzed for its postsecondary persistence patterns and its college graduation rates.

In our study we are interested in the performance of students at three separate levels: the state, the region (there are 20 Regional Education Service Centers in Texas defined by the state, the one for the Houston area is Region IV), and the district. This causes the persistence patterns of students at these different levels to appear quite dissimilar; far more students move out of a district than move out of the entire state, so persistence patterns for the districts will appear signifi-

cantly lower than the persistence rate for the state if you define the state cohort as all students who remain in the state. We have attempted to overcome this potentially misleading comparison by including only students who stayed in the same district even for the region and state cohorts. Thus, if a Region IV student moves to another school that is still in Region IV but in a different district, that student would be excluded from the analysis.

As the second cohort is composed of those students who only attended a district or region of interest their senior year of high school, interpretations of the relationships between district attendance and college persistence and completion rates must be more tentative for the analyses of this cohort. For example, because a student who attended District A from kindergarten through grade eleven but moved to District B before her senior year would be included in the District B cohort, it would be unwise to attribute that student's ability to persist in postsecondary to the education she received in District B. Thus, the analyses of Cohort 2's trajectory will focus primarily on the influence of individual-level variables on college persistence and completion rather than on the relationship between district attended and these outcomes.

While the study focused primarily on the educational patterns of Houston Independent School District (HISD) students, the research team was also interested in comparing the performance of HISD to the state as a whole, Region IV, and neighboring districts. Thus, in the full report results are often reported for these other groups of students in order to allow the performance of HISD students to be compared to that of their peers. Data are presented for students across the state of Texas, for all students in Region IV, and for students in the ten largest districts in Region IV after HISD (Aldine, Alief, Clear Creek, Cypress-Fairbanks, Humble, Katy, Klein, Pasadena, Spring, and Spring Branch) in the full report.

> "By understanding the types of schools and districts that provide strong structures of support to encourage skills and aspirations for a college-going culture, we can better equip high school students to access postsecondary institutions and meet these 21st-century challenges."

Literature Background

Given the persistent gaps in postsecondary transition and success, educational researchers have devoted significant attention to the role that high schools play in postsecondary outcomes. Extant research has identified several facets of a student's secondary education that significantly predict postsecondary outcomes. This section provides a brief synopsis of the more robust findings to-date.

In a widely cited Department of Education study, Adelman (1999) examined student transcript data to assess the relationship between high school characteristics and postsecondary outcomes for a national sample of students who were high school sophomores in 1980. Adelman found student high school GPA, achievement test scores and the rigor of their coursework to be significant predictors of postsecondary completion. A number of other studies have identified similar relationships between student academic resources and postsecondary outcomes (ACT, 2004; USDOE, 2001).

Another important facet of this research area is the extent to which there are significant racial/ethnic and socioeconomic differences in the relationship between student academic preparedness and postsecondary outcomes, specifically as measured by the amount of advanced coursework available to and completed by students. Extant research has found that non-white and poor students graduate from high school less prepared for college than their white and economically privileged counterparts (Barth, 2003; USDOE, 1999).

This unequal distribution of advanced coursework completion is particularly problematic because the amount and level of advanced coursework taken by a student in high school is highly predictive of their postsecondary success. For example, Adelman (1999) found that the level of high school mathematics a student reaches is highly predictive of their likelihood of obtaining a bachelor's degree. Among students finishing high school with Algebra 2 or less, 40% obtained a bachelor's degree. Comparatively, 80% of the students that completed calculus obtained bachelor's degrees.

Research has also shown that enrollment and completion of college-credit courses can help students gain access to and successfully complete postsecondary. College-credit courses allow students to receive college credit for the same classes they are taking to meet their diploma requirements. There are two main types of college-credit courses, Advanced Placement (AP) and dual-credit. The first allows students to take a national test at the end of the school year covering their course content; this test will allow them either to test out of base level college courses or to be granted course credit for them upon entrance to a higher education institution. Dual-credit courses are a bit different in that they are classes where the student is simultaneously enrolled at a high school and a higher education institution. Students in dual-credit courses gain credit to both institutions through course content and assessments. Both AP courses and dual-credit have been shown to positively impact student success in high school and greater participation in higher education, especially for minority and poor students (Flowers, 2008; Hoffman, 2003; Kirst, Venezia, & Nodine, 2009; Santoli, 2002).

AP coursework in high school is linked to a variety of positive outcomes. Santoli (2002) conducted a literature review of research on AP participation and found that the research suggests positive impacts of the program on college enrollment, persistence, and degree completion. Participation in AP courses seems to be especially beneficial to traditionally disadvantaged students. For example, African American and Hispanic students who participated in the AP program scored higher on college entrance exams and had higher college GPAs (Flowers, 2008). Currently, though, minority and low-socioeconomic students are vastly underrepresented in AP programs (Klopfenstein, 2004; Ndura, Robinson, & Ochs, 2003; Solorzano & Ornelas, 2002; 2004; The College Board, 2004; 2006; Venkateswaran, 2004).

Dual-credit courses count for both high school credit and college credit, even giving the student a college transcript before graduation. Unlike AP courses, dual-credit courses are actual college credits and not subject to the rules of the higher education institution a student enrolls in later. Bailey and Karp (2003) conducted a review of the early research on dual-credit courses and found little support for the program at the time. However, more recent reports from several different states show more promising evidence for dual-credit programs' effects on academic achievement and attainment. Studies from New York City (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007; Michalowski, 2006; Skadberg, 2005) suggest positive impact of the city's *College Now* dual-enrollment program. Dual-credit programs in Florida also show positive impacts on student enrollment in higher education (Florida DoE, 2004; Hoffman, Vargas, & Santos, 2009; Bailey & Karp, 2003; Karp & Jeong, 2008). Further, early study of Texas' and California's dual-credit programs show a positive influence for participating students on higher education enrollment (Kirst et al, 2009; Texas P-16 Council, 2007). Lastly, a growing body of research suggests that their use can directly help students who would not otherwise continue their education past high school (Hoffman, 2003; Kirst et al, 2009; Texas P-16 Council, 2007).

Methodology

Data Source

The data for this report were provided by the TERC. This research center is one of three in the state created by the 79th Texas Legislature, 3rd called session, in 2006. These ERCs contain nearly all education data collected by the Texas Education Agency (TEA), the THECB, and the Texas Workforce Commission and combine them into a single database. The integrated nature of the database allows researchers to follow the educational trajectory students take from elementary school through postsecondary institutions and into their careers. TEA and THECB datasets were merged in order to allow the researchers to study the transition patterns students made from K-12 to postsecondary institutions.

Statistical Techniques

Given the nature of our outcome variables of interest, two primary statistical techniques were used for our analyses. When an outcome variable being studied is described as "dichotomous" (yes/no, pass/fail, graduated/did not graduate) and occurs at a specific point in time, logistic regression techniques are often the most appropriate statistical models. With logistic regression, the outcome variable is defined as the odds that the outcome of interest will occur, and each variable in the model predicts the estimated difference in the odds of the outcome occurring. An odds ratio greater than one represents an increase in the likelihood of the outcome, while a ratio between zero and one indicates a decrease in the likelihood of the outcome. Logistic regression methods were used to investigate the predictors of both postsecondary access and postsecondary completion.

As the second cohort of students was followed through twelve semesters of postsecondary education, twelve separate models would need to be analyzed if logistic regression techniques were used to study postsecondary persistence. Because of this, a different technique known as survival analysis, event-history analysis, or failure analysis was chosen to study student persistence patterns. In survival analysis the outcome variable is still dichotomous (persist/did not persist) but the technique allows the researcher to follow a cohort over a period of time and include all of the data in a single model for the entire time period. Instead of an odds ratio, each predictor in the model is assigned a hazard ratio. While hazard ratios and odds are different, the interpretations of the estimates for the variables in the model are similar. Just as in logistic regression, a hazard ratio estimate greater than one indicates an increase in the likelihood of the outcome while an estimate between zero and one represents a decrease in the likelihood. However, because the outcome in our postsecondary persistence survival analyses is actually failure to persist, higher hazard ratios indicate a higher level of risk for dropping out of postsecondary.

While descriptive data are presented for the entire state, Region IV, HISD, and the ten other districts in the study, the analyses were conducted solely with the data from the eleven districts. This was done to allow HISD's performance to be compared directly to the performance of its ten largest neighboring districts. The results of the analyses are therefore only truly generalizable to the eleven districts that were included in the analyses. The relative performance of the eleven districts is presented in detail in the full report.

In the full study, for each topic of interest (access, persistence, and completion), we examined two types of outcome groups. The first outcome group included all postsecondary institutions in the sample, whether they are technical schools, community colleges, public universities, or private universities. The second group includes only public 4-year universities in Texas and the students that attend them. In this executive summary, we will highlight the factors that influence postsecondary outcomes generally that are common to all types of institutions of higher education. In the next section we present selected results from the full study.

Results

The state of Texas educates over 4 million students in the public K-12 schools every year. Table 1 below presents some basic demographic information for the state, Region IV, and HISD. As evidenced by this table, enrollment in Texas schools is composed primarily of non-white students with 43.8% of Texas students being Hispanic and 14.3% African-American as of 2003-04. The percentage of lower-income students in the state has also increased over time with approximately 53% of Texas students being classified as economically disadvantaged in 2003-04 as defined by enrollment in federally funded free- or reduced-priced lunch.

HISD is the largest school district in Texas and the seventh largest in the United States serving 211,157 students in 307 schools. In 2003, the student population in this district is composed of 58.1% Hispanic students and 29.8% African American students. Asian students are 3.0% of the HISD population, Native American students are 0.1%, and White students are the remaining 9.1%. Of note, 81.7% of the student population is economically disadvantaged, meeting the federal criteria for free and reducedprice lunch programs (TEA, 2003).

Table 1: Total State, Region IV, and HISD Demographics, 2003-04*

Level	#Students	Amer. Ind./ Alaska	Asian Pacific Isld.	Afr. Amer.	Hispanic	White	Econo. Disadv.	LEP	Spec Ed
State	4,311,502	0.3%	2.9%	14.3%	43.8%	38.7%	52.8%	15.3%	11.6%
Region IV	944,176	0.2%	5.4%	21.5%	40.5%	32.5%	51.5%	17.9%	10.0%
HISD	211,157	0.1%	3.0%	29.8%	58.1%	9.1%	81.7%	29.0%	10.0%

* Academic Excellence Indicator System Data, 2003-04 (TEA, 2003)

High School Persistence, Dropouts, and Graduation

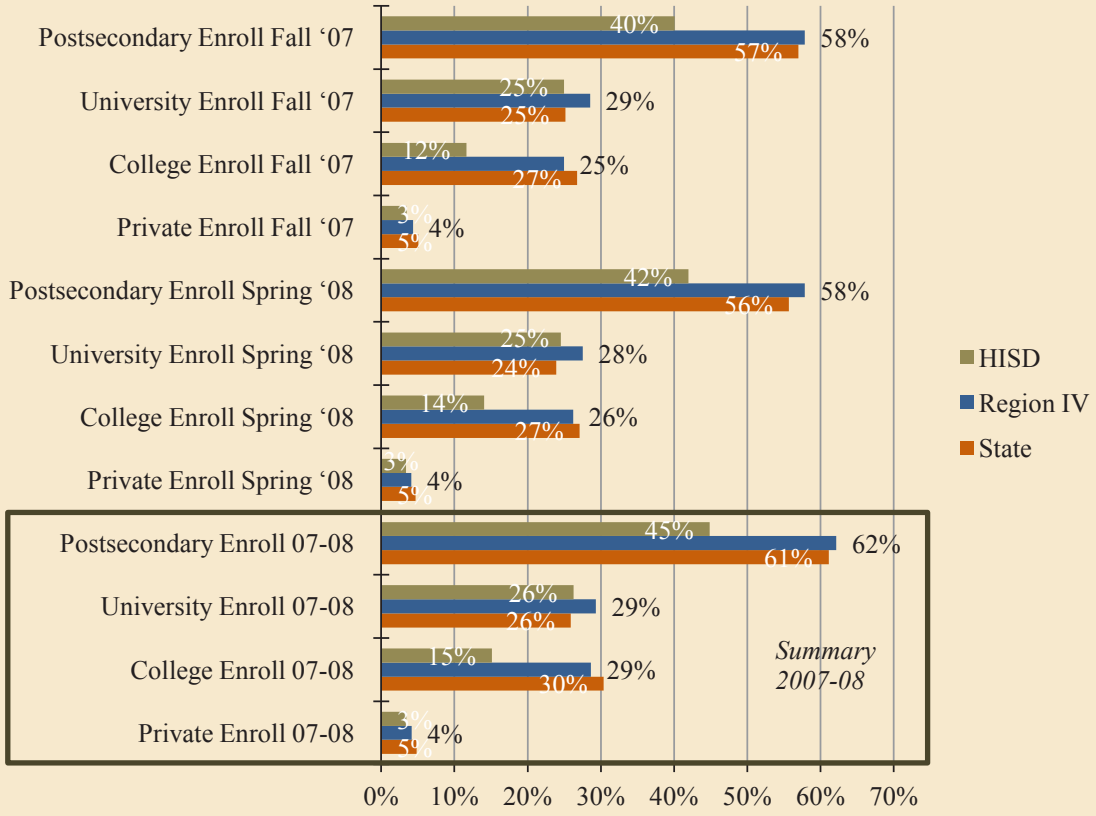
The research team first investigated high school graduation rates. Table 2 contains this data for the state, Region IV, and HISD. Three different methods of calculating graduation rates were used for the data in this table. In the "percent of beginners that graduate" column, a student was counted as a graduate if they were in the 9th grade cohort and they graduated from any district at any time by the 2006-07 school year. This number serves as the percentage of the entering cohort that graduates on-time somewhere in the state. The "percent of persisters that graduate" row restricts the sample to only those students that were present in the same district for all four years of high school and then calculates the percentage of those students that graduated. This graduation rate is expected to be high given the fact that all of these students made it through all four years of high school without repeating a grade or dropping out, making it somewhat discouraging to see that more than 16.0% of students in HISD that made it through all four years of high school still failed to graduate on time. The final rate presented in Table 2 is likely the most disheartening as it represents the percentage of the original 9th grade cohort that persisted in the same district through all four years of high school and graduated on time. Texas and Region IV both had rates in the mid-40.0% range for this graduation rate.

Table 2: Student Persistence and Graduation Rates for State, Region IV, and Houston ISD.

	9th Graders 2003-04	# of Graduates, Any District	% of Beginners that Graduate	All Years, Same District	# of Graduates, Same District	% of Persisters that Graduate	% of Total that Persist and Graduate
State	391,557	224,398	57.3%	197056	178142	90.4%	45.5%
Region IV	85,844	47616	55.4%	41481	37344	90.0%	43.5%
HISD	18,524	7986	43.1%	6793	5676	83.6%	30.6%

Postsecondary Access and Preparedness of High School Students

Figure 1: College Access Rates for State, Region IV and HISD



This section again examines Cohort 1 students but focuses on two primary topics of interest relating to college access, which are: 1) Who gains access to postsecondary institutions out of the cohort that persisted through high school and graduated on-time, and; 2) What factors at the K-12 level predict postsecondary access?

Figure 1 illustrates data on the Texas postsecondary institution enrollment of students across the state, from Region IV, and from HISD. The baseline denominator for the calculated rates contained in Figure 1 represents the number of students from the original 9th grade cohort that persisted through all four years of high school in the same district and successfully graduated from high school. The rates in this figure are also disaggregated by semester (fall 2007 or spring 2008) and by type of institution attended (public university, college or technical school, and private university). This illustrates the percent-

age of persister graduates that enrolled in some type of postsecondary institution at any time during their first year out of high school. As shown in Figure 1, more than 60% of persister graduates from Region IV and the state enrolled in some type of postsecondary institution after graduation while only about 45% of HISD students did. However, a higher percentage of HISD students did gain access to universities than the state average.

After assessing the relative rates of postsecondary access for our cohort we investigated the factors that predict postsecondary access. As mentioned in our methodology section, the dichotomous nature of our outcome variable of interest (postsecondary access) lends itself to analysis through logistic regression techniques. With logistic regression, the outcome variable is in fact a ratio of the probability of an event occurring over the probability of it not occurring. It should be noted that the outcome is not a percentage. An odds ratio, which represents the difference in the odds of the outcome variable occurring, is estimated for each variable in the model. If an estimated odds ratio is greater than 1 the likelihood of the outcome occurring is higher while an odds ratio between 0 and 1 means that the odds of the outcome occurring are lower.

In the following models, this study addresses student achievement performance using the state assessment examination. In 2003, the Texas legislature significantly revamped the state's educational accountability system and redesigned the assessment to the current system called Texas Assessment of Knowledge and Skills (TAKS). The "TAKS___CR" variables indicate whether or not a student scored high enough on the TAKS test in that subject to be classified as college-ready (as defined by TEA's standards for college-readiness). In addition, the "Total Advanced Core" and "Total Dual-Credit" variables represent the total number of advanced core classes and dual-credit non-advanced classes, respectively, that a student received credit for from all four years of high school. The "percent attend" variable indicates the percentage of total days a student attended high school for which he or she was eligible. The access model in this section also attempts to control for district-level variables. Each district-level variable represents the percentage of the district students classified in that category.

Table 3 presents the results for the variables that were included in the first access model. The outcome variable is any type of postsecondary access. The variables in the model are divided into two parts, although this is simply for ease of interpretation and does not reflect any characteristic of the analysis itself. The left-hand side of the table includes all individual-level variables that were included in the model and the right-hand side contains the district-level variables. The first column is the name of the variable in the model, the second column is the standard estimate of the variable, the third column is the odds ratio for the variable which is calculated from the standard estimate, and the final column contains the results of a test of statistical significance (a number less than .05 is considered "statistically significant" by conventional social science standards).

In terms of ethnicity, Asian students are approximately 1.35 times more likely than whites to gain access to college, while Hispanic students are about 0.77 times less likely than whites to access college. However, the model did not find any significant difference between the access rates of whites and African-Americans. As was predicted, economically disadvantaged, LEP, and special education students were all significantly less likely to enroll in college, with LEP students being by far the least likely with odds of 0.25. Put differently, a LEP student is approximately four times less likely to go to college than a non-LEP student of the same socioeconomic status and with the same academic background. Males were also found to be roughly 0.83 times less likely than females to make it to college. Interestingly, while some

Table 3: Access Model: Individual-Level Variables and District-Level Variables

Individual-Level Variables				District-Level Variables			
Variable	Stand Est	Odds Ratio	Sig.	Variable	Stand Est	Odds Ratio	Sig.
Intercept	-3.81		<.0001	Intercept	-3.81		<.0001
Asian	0.23	1.35	<.0001	District Minority%	0.04	1.04	<.0001
African-American	0.05	1.05	0.339	District LEP%	0.01	1.01	0.403
Hispanic	-0.26	0.77	<.0001	District Econ Dis%	-0.05	0.96	<.0001
Econ Dis	-0.33	0.72	<.0001	District Special Ed %	-0.15	0.86	<.0001
LEP	-1.39	0.25	<.0001	District Gifted %	0.03	1.03	0.043
Special Ed	-0.29	0.75	<.0001				
Gifted	-0.10	0.90	0.035				
Male	-0.19	0.83	<.0001				
Percent Attend	0.05	1.05	<.0001				
TAKS Reading CR	0.30	1.35	<.0001				
TAKS Math CR	0.26	1.30	<.0001				
TAKS Social CR	0.30	1.35	<.0001				
TAKS Science CR	0.14	1.15	0.008				
TAKS All CR	-0.11	0.90	0.076				
Total Advanced Core	0.00	1.00	0.451				
Total Dual-Credit	0.11	1.11	<.0001				

researchers have argued that there is little relationship between performance on standardized assessment and college access, our model found that scoring at the level of college-readiness was significantly related to college enrollment for every TAKS subject area. However, when controlling for performance on the individual assessments, there was no additional benefit of scoring at the college-ready level on all subjects simultaneously. Also noteworthy were the findings that each additional dual-credit course passed increased a student's odds of accessing college by approximately 12%, but there was no significant relationship between advanced coursework and college enrollment.

In addition to the individual-level variables, the results for this model included the aggregate district-level variables. These variables represent the percent of the entire student body (not just the 9th grade cohort) that was classified as having the characteristic the variable represents. As these variables are continuous and can range anywhere from 0-100%, the odds ratios represent the change in the odds of a student accessing college for every 1% increase in the district-level variable. For example, the economically disadvantaged odds ratio of 0.96 means that, controlling for all of the individual-level characteristics as well as the other district-level variables, a student is 0.96 times as likely to access college for every percent increase in the district's economically disadvantaged population. The aggregate impact of special education students was also found to negatively influence postsecondary access chances as every one percent increase in a district's special education population results in a student being 0.86 times as likely to enroll in college. Districts with higher percentages of economically disadvantaged and special education students are therefore predicted to have lower rates of postsecondary access. The opposite holds true for the gifted population as increases in the district's gifted student percentage increases the likelihood of students accessing college. Interestingly, this model also found the same positive relationship for percent minority. Students are actually 1.04 times as likely to make it to the postsecondary level for every one percent increase in the minority population in their district. No significant relationship was detected between percent LEP and the odds of postsecondary access at the aggregate district-level.

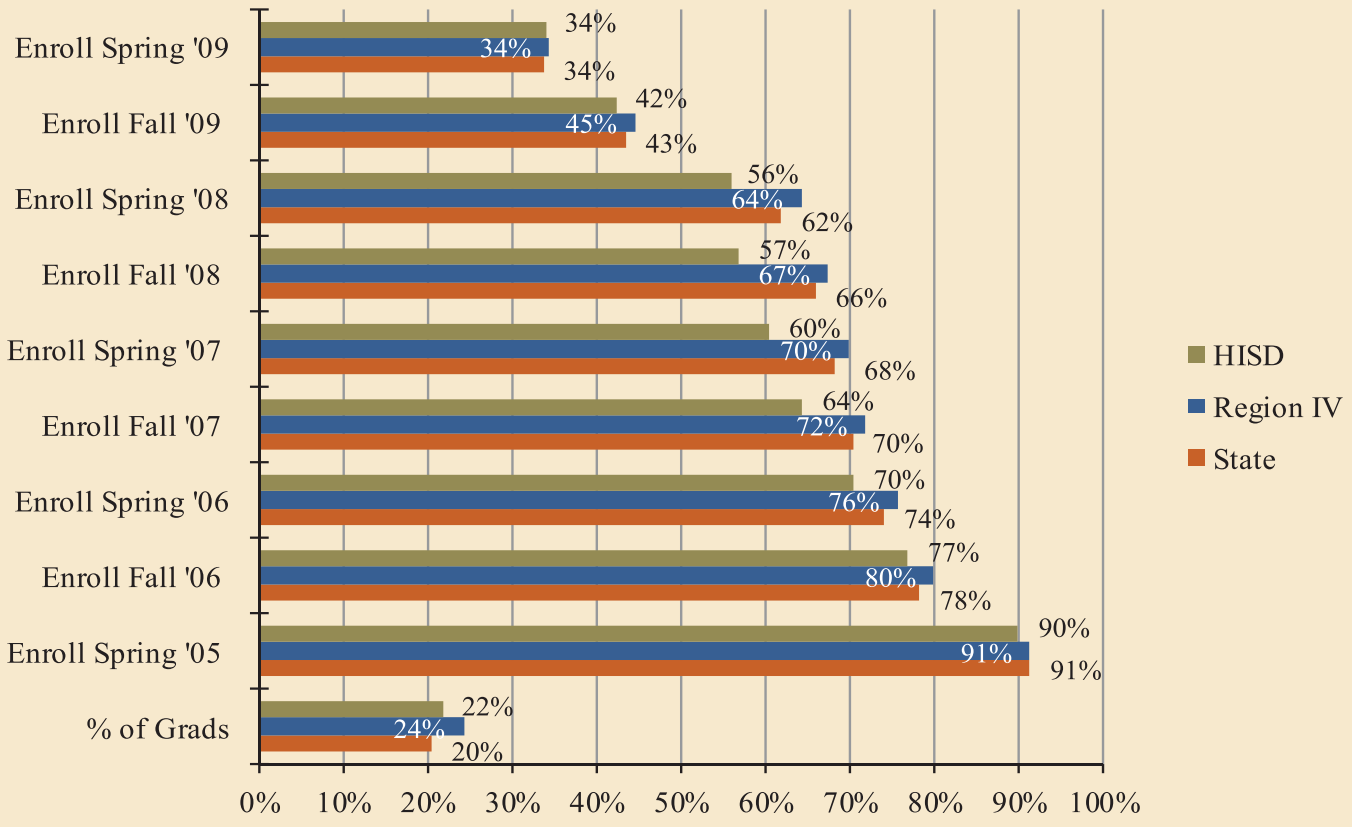
Postsecondary Persistence

The previous section identified a number of factors that both improve and inhibit a student's chances of gaining access to a postsecondary institution: academic preparation through advanced and dual-credit coursework, performance on standardized assessments, demographic characteristics, and the demographic composition of the district a student attends are all predictive of college access. However, gaining access to a college or university does not mean that a student will persist and successfully complete their postsecondary education, and thus far it remains to be seen if the variables that predict college access will also predict college persistence and completion. This section focuses on college persistence patterns for students across the state and students from Region IV, and HISD, as well as those factors that predict persistence through college.

As mentioned in the methodology section, the cohort of students used for the previous two sections had only been out of high school for three years at the time of this study, making it difficult to study their college persistence and completion patterns. We therefore have elected to follow a different cohort of students for the final two sections of our analyses. Cohort 2 students were seniors during the 2003-04 school year and thus had experienced six years of possible postsecondary education at the time of this report.

Figure 2 provides a picture of the postsecondary persistence patterns for the state, Region IV, and HISD students in Cohort 2. The baseline denominator for the calculated rates contained in Figure 2 represents the number of students remaining out of the cohort that enrolled in college during the first semester. The rates in this figure are also disaggregated by semester (fall 2007 or spring 2008) and by type of institution attended (public university, college or technical school, and private university). Each variable indicates the school year for that semester as opposed to the actual calendar year. For example, the "Fall 05" variable represents students that were enrolled in the fall of the 2004-05 year, which actually occurred in 2004. It should also be mentioned that this figure only spans the first five postsecondary years. This is because significant percentages of students are lost after the fourth year, but this is likely due primarily to students graduating from college. Additionally, the calculations of these rates allow for students to exit and subsequently reenter postsecondary and still be counted as attendees in later semesters.

Figure 2: College Persistence Rates for State, Region IV, and HISD



There appear to be both a number of similarities and some important variation in the persistence patterns. In terms of similarity across HISD, Region IV, and the state, the first two semesters of postsecondary enrollment seems to be particularly treacherous for students as sizeable percentages of the cohort are lost during these semesters. The rate of attrition appears to decrease after these first two semesters for all cohorts. While this pattern is common for all students, HISD students begin exiting postsecondary before graduating at higher rates than their peers. By the spring of 2007, approximately 10% fewer HISD students are remaining in postsecondary compared to the Region IV average. By the spring of 2008 nearly half of all postsecondary enrollees are no longer attending, although many of these students may have earned an associate's degree or postsecondary certificate by this time.

Our analysis of persistence presented below further explores the phenomenon of postsecondary persistence. In the persistence model illustrated in Table 4, the variables are once again divided by whether they are student-level or district-level variables. In regards to the student-level variables, there are both similarities and some important differences between the current persistence model and the access model from the previous section. In terms of race, Asian students are found to be performing better than their white peers while Hispanics are performing lower than whites, results consistent with the access models. However, while African-Americans were found to be accessing postsecondary at rates equivalent to whites, they are estimated to be at significantly higher risk of leaving postsecondary than their white peers. Economically disadvantaged, LEP, and special education students are likewise significantly less likely to persist than their peers. Fortunately, academic preparation does appear to improve a student's chances of persisting as all three academic variables (advanced coursework, dual-credit coursework, and attendance) were found to significantly reduce the likelihood of early postsecondary exit.

While district-level variables likely affect the relationship between individual student characteristics and postsecondary persistence, the direction and strength of their influence is thus far unknown. The inclusion of the district-level variables in the model attempts to discover these precise relationships, and many of them are unexpected. As shown in the following table (Table 4), the results of the analysis indicate that higher percentages of non-Asian minority and LEP students actually decrease the risk of postsecondary failure by a statistically significant amount. Specifically, for every one percent increase in the district's minority population a student's risk of dropping out of postsecondary decreases by approximately 1.2%. This is an interesting finding that aligns with the postsecondary access model presented in the previous section. In both of these models, higher percentages of minority students result in a higher likelihood of positive postsecondary outcomes. Given the limitations of the study it is difficult to determine why this relationship might be occurring, but future research could more deeply investigate this finding.

Less surprising was the result that the percent of economically disadvantaged students in the district has a negative impact on any given student's likelihood of postsecondary persistence. Once again, this result was also found in the previous section on access as higher percentages of economically disadvantaged students in the district had a harmful impact on any given student's chances of postsecondary access. The results of the current model estimate that for every one percent increase in the economically disadvantaged population, a student's likelihood of failure also increases by approximately 3.0%. Additionally, there was also a strong, negative relationship between the percent of gifted students in the district and likelihood of postsecondary failure. Overall, then, it appears that many of the district-level variables are not only significantly related to postsecondary outcomes but their influence on the outcome is often consistent across different postsecondary outcomes.

Table 4: Persistence Model: Individual-Level Variables and District-Level Variables

Individual-Level Variables				District-Level Variables			
Variable	**Prmtr Est**	**Hazard Ratio**	**Sig.**	**Variable**	**Prmtr Est**	**Hazard Ratio**	**Sig.**
Asian	-0.199	0.819	<.0001	District Minority%	-0.014	0.986	0.0008
African-American	0.289	1.336	<.0001	District LEP%	-0.023	0.977	<.0001
Hispanic	0.206	1.229	<.0001	District Econ Dis%	0.025	1.026	<.0001
Econ Dis	0.148	1.159	<.0001	District Special Ed %	-0.011	0.989	0.4896
LEP	0.218	1.244	0.0455	District Gifted %	-0.056	0.946	<.0001
Special Ed	0.484	1.623	<.0001				
Gifted	-0.015	0.985	0.7188				
Male	0.125	1.133	<.0001				
Total Advanced Core	-0.035	0.966	<.0001				
Total Dual-Credit	-0.086	0.918	<.0001				
Percent Attend	-0.043	0.958	<.0001				

College Completion

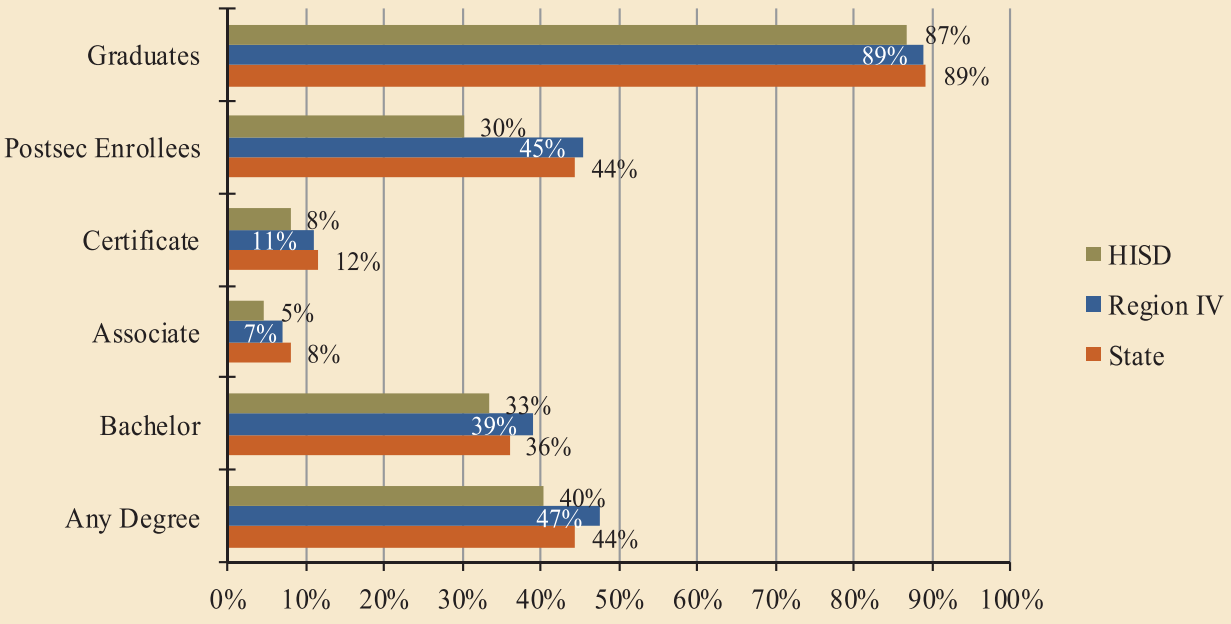
The final section of the analyses focuses on whether or not students successfully complete their postsecondary education and what factors influence their eventual outcomes. This section is important because it relates to a limitation of the types of analyses conducted in the previous section. In survival analysis models, which were used to study postsecondary persistence, once a student exits a postsecondary institution for even a semester they are considered to be excluded from the sample for the remainder of the time period and coded as having "failed" to persist. Because there is no variable for dropping out of school in the postsecondary files like there is in the K-12 data, the only way to determine persistence or failure is to determine whether or not a student is enrolled in any given semester. While the language of "dropping out" was used to describe students in the previous section, this phrase is actually inappropriate given the limitations of the higher education data. These facets of the previous analyses likely result in an overestimation of the percentage of students who fail to persist. This overestimation may be particularly severe for those students who are either more mobile or who may take semesters off to work and save money to finance their postsecondary education. The current section is therefore devoted to assessing college completion regardless of the paths students took to reach that goal.

While bachelor's degrees are obviously considered to be the highest quality undergraduate degree, we believe that associate degrees and certificates are both valuable outcomes for many students. The analyses will focus on whether students completed any type of postsecondary degree or certificate and the factors that predict completion. We were initially unsure as to whether or not associate degrees should be included as these degrees are meant primarily to prepare students to transition to a university and eventually complete a baccalaureate education. However, because THECB does define a student who completes an associate education as having earned a degree, we elected to include such students in our general postsecondary completion models.

These analyses will once again use the student Cohort 2 that was enrolled as seniors in 2003-04 and therefore had experienced six years of possible postsecondary education by the time these analyses were conducted. This six-year time period is often used to study completion as the majority of students who eventually earn a degree or certificate do so by six years after initially enrolling in postsecondary but significant numbers of students have not earned a degree by the conclusion of their fourth year. However, because we are studying postsecondary completion the cohorts will be limited to only those students that enrolled in some type of postsecondary institution during at least one of the first two postsecondary semesters immediately following their high school graduation, the fall 2004 and spring 2005 semesters.

Figure 3 below presents the college completion rates for the state, Region IV, and HISD. The percentages of students who earned some type of degree or certificate are calculated by using only the cohort of postsecondary enrollees as the denominator rather than the entire twelfth grade

Figure 3: College Completion Rates for State, Region IV, and HISD



cohort. Unfortunately, less than half of students that enroll in any type of postsecondary institution upon graduating from high school earn a postsecondary degree or certificate within six years, and only 40% of students that graduate from HISD do so. Another interesting finding was the fact that students complete postsecondary certificates at much higher rates than associate degrees. The average completion rates for the state and Region IV were 44% and 47%, respectively.

The results of the model on postsecondary completion are contained in Table 5. While the previous analyses uncovered some disparities between different groups in regards to access and persistence, the disparities in college completion are arguably the most stark. African-American students are predicted to complete postsecondary at a rate half that of whites, and Asians and Hispanics are likewise found to be significantly less likely to earn a degree or certificate than their white peers. Economically disadvantaged and especially special education students are also found to be completing postsecondary at significantly lower rates than students who are not in these categories. The only student-level variables that were not found to significantly influence a student's chances of completing postsecondary while controlling for district characteristics were the variables for LEP and gifted classification. While the estimate for gifted is nearly significant at the $\alpha = .05$ level ($p = .0535$), there appears to be almost no relationship between LEP classification and one's chances of postsecondary completion. The estimated odds ratio for LEP is approximately 0.99, meaning that a LEP student is for all practical purposes just as likely as a non-LEP student to successfully complete postsecondary. This finding is somewhat unexpected given the fact that LEP students were previously found to gain access to and persist through postsecondary at significantly lower rates than their peers, but this result may be caused in part by the large number of LEP students that earn a postsecondary certificate rather than attempt an associate or bachelor's degree.

In regards to the district-level variables, three of the five variables included in the model were found to be statistically significant. The percent of students classified as special education and percent district minority were the only variables that did not appear to influence the likelihood of postsecondary completion. The aggregate influence of the percent of economically disadvantaged students once again negatively impacts a student's odds of completion. Students are only 0.97 times as likely to earn a degree or certificate. In other words, a 20% increase in the district's economically disadvantaged population means that a student will be approximately half as likely to complete their postsecondary education even when controlling for the student's race, advanced and dual-credit coursework, and personal economic status. The estimate for percent LEP was also found to be significant and that for percent minority was nearly significant ($p = .0889$). Taking a closer look at the relationship between the racial composition of the district and the variety of postsecondary outcome variables we have analyzed begins to reveal a fairly strong and consistent trend. In nearly every analysis thus far, the percent of minority students in the district has significantly influenced the postsecondary outcome of interest, but rather than having a damaging impact on a student it appears as though increasing the percentage of non-Asian minority students increases a student's likelihood of accessing, persisting through, and completing postsecondary. The fact that this variable was found to be significant or nearly significant in the majority of the models leads us to conclude that this finding is not simply an anomaly. Future research could possibly investigate whether this relationship is relatively constant regardless of the total percentage of minority students in the district. For example, higher percentages of minorities could be beneficial if the district is still diverse, but extremely high levels may be detrimental if students become racially isolated from their peers of other races.

Table 5: Completion Model: Individual-Level Variables and District-Level Variables

Individual-Level Variables				District-Level Variables			
Variable	Stand Est	Odds Ratio	Sig.	Variable	Stand Est	Odds Ratio	Sig.
Asian	-0.414	0.661	<.0001	District Minority%	0.012	1.012	0.0889
African-American	-0.729	0.482	<.0001	District LEP%	0.03	1.03	0.0012
Hispanic	-0.487	0.614	<.0001	District Econ Dis%	-0.03	0.97	0.0004
Econ Dis	-0.272	0.762	<.0001	District Special Ed %	0.01	1.01	0.725
LEP	-0.008	0.992	0.9684	District Gifted %	0.067	1.069	0.0009
Special Ed	-0.98	0.375	<.0001				
Gifted	0.13	1.138	0.0535				
Male	-0.444	0.641	<.0001				
Total Advanced Core	0.097	1.102	<.0001				
Total Dual-Credit	0.15	1.162	<.0001				
Percent Attend	0.101	1.106	<.0001				

Conclusions

In this section we will attempt to summarize the results by identifying some of the themes and findings that were discovered throughout the analyses. In general, it was found that the relationship between the district a student attends during high school and her postsecondary outcomes depends largely upon what variables are being controlled for in the statistical model. When no other variables are included in the models the disparities between the districts are large regardless of whether the outcome is access, persistence, or completion. However, accounting for the individual and aggregate influences of student characteristics makes the districts appear to be performing more similar, often quite substantially.

In addition, interpretation of the relationships between a number of other variables and postsecondary outcomes should be done carefully. The relationship between race/ethnicity and postsecondary for African-American students is a telling example. African-Americans and whites were estimated to gain access to postsecondary institutions at essentially the same rate and African-Americans were actually twice as likely to gain access to university when all other variables were controlled for. However, African-Americans had the lowest likelihood of completing postsecondary out of all ethnic subgroups. Once again, a nuanced understanding of the relationships between predictor variables and postsecondary outcome is important in order to more effectively design policies and programs that can better assist all students in accessing, persisting through, and successfully completing postsecondary.

Selected Results

Student-Level Demographic Characteristics

Race/Ethnicity – The relationship between race/ethnicity and postsecondary outcomes depends both on the racial subgroup in question and the outcome variable of interest, and some groups perform much more consistently than others. The performance of Hispanics in relation to whites appears to be the most stable across outcomes. Hispanics performed lower than their white peers when controlling for all other variables on every postsecondary outcome. Asian students were significantly more likely than whites both to gain access to postsecondary institutions and to persist through them, but were significantly less likely than their white peers to successfully complete postsecondary within six years. The relative performance of African-Americans compared to whites was by far the most inconsistent across outcome variables. African-Americans were just as likely as whites to gain access to postsecondary generally when accounting for all other variables. However, African-Americans were at greatest risk of dropping out of postsecondary before completing their degree out of any racial subgroup and were significantly less likely to successfully complete their degree. Overall, then, we would say that special attention should be paid to Hispanics in regard to postsecondary access, Hispanics and African-Americans in regards to postsecondary persistence, and all ethnic subgroups apart from whites in regards to postsecondary completion.

Socioeconomic status – Socioeconomic status was one of the most consistently influential variables on postsecondary outcomes. In all of the final models we ran, economically disadvantaged students were estimated to perform statistically significantly worse than their more advantaged peers. In sum, low-income status at the K-12 level as defined by eligibility for the federal government's free or reduced-price lunch program significantly decreases a student's odds of accessing, persisting through, and successfully completing postsecondary.

Language proficiency status-The relationship between language proficiency status and postsecondary outcomes was one of the most interesting and inexplicable relationships in our analyses. As we expected prior to this research, being classified as having limited English proficiency (LEP) significantly reduces a student's chances of gaining access to a postsecondary institution generally. LEP students are also significantly less likely than their peers to persist through postsecondary institutions. Contrary to our expectations, however, there appear to be no significant differences between LEP and non-LEP students in regards to students likelihood of completing some type of postsecondary degree or certificate. It is difficult to say why this relationship might exist. It is possible that having limited English proficiency significantly decreases a student's odds of accessing postsecondary, but simultaneously those students that do access some type of postsecondary institution may be either more resilient or exceptionally strong in other subjects such as math or science. These are merely some of the possible explanations, however, and are not in any way supported by the data or analyses.

Special education status – Special education status was also one of the more stable variables in our analyses. The performance of special education students was estimated to be lower than their peers for all outcome variables, although the estimates were not always found to be statistically significant given the small sample of special education students in certain analyses. It appears as though being classified as special education at the K-12 level has a significantly detrimental impact on one's likelihood of enjoying successful postsecondary outcomes.

Gifted status – The relationship between being classified as gifted and talented before or during high school and postsecondary outcomes was also quite interesting. Gifted students appear to be slightly less likely than their peers to enroll in a postsecondary institution. There were almost no differences between gifted and non-gifted students in regards to persistence, nor were there any significant differences when the outcome was postsecondary completion generally.

Gender – Interestingly, gender was also one of the most consistently significant variables throughout our analyses. While prior research does indicate that females are often outperforming their male peers, the magnitude and consistency of these gender disparities were both surprising and alarming. Males performed worse than their female peers on every postsecondary outcome, even when controlling for race, socioeconomic status, academic preparation, and all of the other variables in the model. The gender disparity is perhaps most severe in regards to postsecondary completion. Females are approximately 1.5 times more likely than males to complete postsecondary generally, even though males also gain access to postsecondary institutions at a significantly lower rate than females.

"...special attention should be paid to Hispanics in regard to postsecondary access, Hispanics and African-Americans in regards to postsecondary persistence, and all ethnic subgroups apart from whites in regards to postsecondary completion."

District-Level Demographic Characteristics

Percent minority – While the relationship between the percent of minority students in the district and postsecondary outcomes was fairly consistent, the direction of the relationship was not what we had expected prior to conducting this research. In no analysis did the percent of minority students in the district increase a student's risk of a negative postsecondary outcome. Higher percentages of minority students actually increase any given student's likelihood of gaining access to a postsecondary institution and persisting through. We had previously predicted that high percentages of minority students may indicate potentially damaging forms of racial segregation and isolation. However, it may be the case that few districts in the study experienced this type of extreme segregation. The increases in the percentage of minority students may thus be a positive influence as higher levels of diversity prepares students for future success in postsecondary institutions. This would indeed be a heartening conclusion, although more research would need to be conducted in order to reach such a conclusion with a high degree of assurance.

Percent LEP – The influence of the percent of students classified as LEP and postsecondary outcomes was also unexpected. We did not predict that there would be a strong influence of this variable since the overall variation between districts in regards to the percentage of their student body classified as LEP was not very great, and this variable was not very influential in regards to postsecondary access generally. However, higher percentages of LEP students in the district do appear to significantly reduce the risk of a student dropping out of postsecondary and significantly increase the likelihood that a student will successfully complete postsecondary. It is difficult to say why this relationship might be occurring.

Percent economically disadvantaged – The percent of the students in the district classified as economically disadvantaged had the most consistently harmful impact on student postsecondary outcomes out of any of the district-level student characteristic variables. This variable was found to have a statistically significantly negative impact on access, persistence, and completion. While it may not be entirely surprising that this is the case, the finding is still quite remarkable. Higher percentages of lower-income students decrease the likelihood that any given student, regardless of her personal economic status, will enjoy positive postsecondary outcomes.

Percent special education –Through the first five analyses, it appeared as though the percent of students in the district classified as special education only had an influence on access. While higher percentages of special education students had a negative influence on a student's likelihood of gaining access to a postsecondary institution, no significant relationship was discovered between percent special education and the persistence outcome or postsecondary completion.

Percent gifted – Prior to actually running the analyses, we also predicted that there would not be a strong influence of the percent of students classified as gifted on postsecondary outcomes. This is definitely not what we found. The influence of this variable was precisely the opposite of the influence of percent economically disadvantaged; the percent of gifted students had a significant and positive influence on every postsecondary outcome. Once again, this aggregate influence is controlling for the influence of an individual student's gifted status, meaning that a higher percentage of gifted students in the district increases the likelihood of positive postsecondary outcomes for all students, regardless of their personal gifted status. This variable was even more influential when the outcome was persistence or completion than when it was for access. This is an interesting finding given the fact that the influence of district attendance on postsecondary outcomes was stronger for access than for persistence or completion.

Academic Preparation

Scores on state accountability assessments (TAKS) – Because of the way the cohorts were defined in the study, TAKS scores were only used for our analysis of postsecondary access for Cohort 1 and we can say nothing about the relationship between TAKS scores and postsecondary persistence or completion. However, we did find that scoring at the level of college-readiness as defined by TEA's standards did result in a significant increase in students' odds of accessing postsecondary institutions generally as well as universities specifically. Additionally, there was a significant impact for scoring at the college-ready level for each subject tested by TAKS. However, we did not find any additional impact of being college-ready on all four TAKS subjects simultaneously above and beyond the influence of being college-ready on the individual subjects.

Advanced courses – The advanced courses variable in the model represented the number of total credits a student earned during their entire high school tenure in those classes that were both defined as advanced by TEA and in one of the core subject areas (math, science, social studies, English/language arts, and foreign language). The relationship between this variable and postsecondary outcome was also quite complex. The number of credits earned in advanced core courses was positively related to postsecondary persistence and postsecondary completion. However, there was almost no relationship between this variable and postsecondary access generally. Overall, though, it does appear that there is a fairly consistent, positive relationship between advanced courses completed and postsecondary outcomes.

Dual-credit courses – While the influence of advanced coursework on postsecondary outcomes was nuanced, the completion of dual-credit coursework had a consistently strong and positive relationship with all postsecondary outcomes. The dual-credit variable was found to be statistically significant in every postsecondary model and the actual estimate of the variable was also found to be much greater than that for advanced coursework in all models. It should also be noted that this variable only included dual-credit courses that were not defined as advanced by TEA (as those courses were included in the advanced courses variable), meaning that the influence of dual-credit coursework could actually be even larger. This is a somewhat surprising finding given the fact that districts have much more leeway in defining dual-credit courses, creating partnerships with local community colleges and universities to develop these courses, and actually offering them to students. Expanding dual-credit course offerings to students, especially those that are less likely to gain access to, persist through, and complete postsecondary may be a promising practice.

Attendance – The final variable included in the analyses that we categorized as academic is the percent of total days for which a student was enrolled that they actually attended high school. While we originally included this variable primarily as a control, we were quite surprised to see the consistent and positive relationship between this variable and postsecondary outcome. High school attendance was found to significantly increase a student's positive postsecondary outcome regardless of which outcome variable was being modeled. This influence could be caused by a number of factors. One explanation would be that the additional education a student receives during high school increases their chances of enjoying positive postsecondary outcomes. Another explanation could be that students who develop positive attendance habits during high school may continue those habits during postsecondary and attend their college or university classes at higher rates. Either way, students that attend high school for a higher percentage of days are more likely to experience positive postsecondary outcomes and, conversely, students who attend less during high school may be at increased risk of failing to access, persist through, and complete their postsecondary education.

> "...the completion of dual-credit coursework had a consistently strong and positive relationship with all postsecondary outcomes."

Summary

Never before in the history of our nation has there appeared to be more emphasis placed on the importance of college access and completion, especially for low-income and minority students. This is particularly true in Texas, where both the Texas legislature and the Texas Higher Education Coordinating Board have set ambitious goals for this generation of students that are either currently enrolled in college or about to graduate from high school.

In this light, our goal has been to present results in the report that describe the current conditions in this large urban area in Texas. By specifying these conditions and identifying areas of strengths and weaknesses, we hope this information will assist educators and policy makers in determining where targeted efforts should be focused.
The results of this study focus on four primary categories of research questions: 1) Who persists through high school; 2) Who gains access to postsecondary institutions and why; 3) Who persists through college and why, and; 4) Who eventually completes their postsecondary education and earns some type of degree or certificate and why?

Although schools and districts cannot control what students enter their classrooms, it does not mean that they are unable to affect their students' postsecondary outcomes. As this research indicates, the courses that students complete at the K-12 level and their level of academic preparation both have a powerful influence on their likelihood of accessing and completing college. Our research found that scoring at the level of college-readiness was significantly related to college enrollment for every TAKS subject area. In addition, dual-credit courses appear to be a particularly promising approach to preparing students for postsecondary success, particularly for students that may not be enrolled in or qualified for advanced courses during high school. Districts should continue to explore potential partnerships between themselves and local colleges and universities in order to expand dual-credit offerings to their students and help them earn college credits even before graduating.

Once student enroll in postsecondary, the first two semesters of enrollment seem to be particularly treacherous for students as sizeable percentages of the cohort are lost during these semesters. The rate of attrition appears to decrease after these first two semesters for all cohorts. Also, while African-Americans were found to be accessing postsecondary at rates equivalent to whites, they are estimated to be at significantly higher risk of leaving postsecondary than their white peers.

Finally, the study addressed whether students completed any type of postsecondary degree or certificate. Unfortunately, less than half of students that enroll in any type of postsecondary institution upon graduating from high school earn a postsecondary degree or certificate within six years, and only 40% of students that graduate from HISD do so. In addition, African-American students are predicted to complete postsecondary at a rate half that of whites, and Asians and Hispanics are likewise found to be significantly less likely to earn a degree or certificate than their white peers.

Overall, we found that while we are working to close the gaps in college access and completion between poor, Hispanic, and African-American students and their peers, these gaps remain large. Even when controlling for academic preparation, low-income and minority students are often still at a significant disadvantage in terms of postsecondary outcomes. These disparities also appear to be exacerbated by the concentration of low-income students in a district, meaning that more attention ought to be paid on the aggregate influence of poverty on students' postsecondary chances.

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