Examining Differential Outcome Trajectories of Similarly Qualified Latino Students Beginning Postsecondary Education at Community Colleges versus Less-Selective Four-Year Universities

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Purpose and Research Questions

This study seeks to answer two related questions. What were the descriptive differences, over time, in key outcomes (e.g., completion of a bachelor's degree) for similarly qualified students beginning their postsecondary experiences at one of the 32 "less-selective" universities in Texas compared with those beginning at a community college? Further, what was the relative contribution of that choice toward likelihood to persist and to graduate with a bachelor's degree?

While UT and A&M accounted for one-quarter of the enrolled first-time-in-college undergraduate student body in 2008 (Texas Higher Education Coordinating Board, 2008), these two flagship institutions only account for one-fifth of the total enrollment among students at four-year institutions in the state and for only 15 percent of the Latino students enrolling in postsecondary education in Texas under the same classification (Texas Higher Education Coordinating Board, 2010). Further, community colleges educate more than half of *all* postsecondary students in the state, a preponderance of which are Latino and African American (National Center for Education Statistics, 2003). Much research has focused broadly on the relative benefits of beginning postsecondary education at a community college relative to a selective four-year institution (e.g., Cohen & Brawer, 2003; Dougherty & Kienzl, 2006; Kane & Rouse, 1995). However, such work has not effectively distinguished the net contribution of the community college to the less-selective four-year institution more specifically toward degree pursuit. Given that both types of institutions together serve the vast majority of the state's Latino

students, a clearer understanding of their comparative effectiveness with respect to moving students toward a BA is critical.

Relevant Literature

As noted in the literature, Hispanics will comprise a substantial proportion of the growth in population in the next 50 years (51%) resulting in 25 percent of the total U.S. population in the year 2050 (Llagas & Snyder, 2003). While the number of Latinos has been increasing at a fast pace, Hispanics trail other racial/ethnic groups in education (Fry, 2004), with only 10 percent of Hispanics between the ages of 25 to 29 having earned an undergraduate or graduate degree as compared to 34 percent of their White counterparts and 18 percent of Blacks (Llagas & Snyder, 2003). Among the largest subgroup of Latinos, 50 percent of Mexican American students do not graduate from high school when using 9th grade enrollment as the baseline year. More heartrending, not all Latino students that graduate enroll in college. It has been found that only 35 to 40 percent of high school graduates enroll in higher education (Arbona & Nora, 2005; Nora, 2005). Roughly 22 percent of the 18 to 24 year old Hispanic students in the United States attend college. The vast majority of Hispanic students that are eligible to attend college are enrolled in two-year institutions (Fry, 2004). While it is estimated that 36 percent of Hispanic students enroll in college following their high school graduation [an increase from the 27 percent in 1985 (Llagas & Snyder, 2003), 48 percent to 55 percent of White students graduating from high school go on to enroll in college.

Upon close examination, differences in the types of colleges Latino students attend when compared to White students become very apparent. Hispanics unmistakably attend two-year colleges or four-year institutions that are less selective (Pew Hispanic Center, 2005). A total of 66 percent of Hispanic students enroll in a community college or a four-year institution with an

open-door policy. In comparison, only 45 percent of White students are enrolled in similar institutions. Schrag (2005) reported that there are "four times as many Latinos in community colleges as there are in UC, the California State University and all California private colleges combined." As expected, differences also extend to enrollment in highly selective colleges (Fry, 2004).

Even though access into higher education for Hispanic students was declared a national priority at all postsecondary levels by the Clinton and Bush administrations (Fry, 2004), substantial gaps continue to exist, emphasizing the need for much more research regarding the unique needs of Latino students in higher education to begin to make a difference (Hurtado & Ponjuan, 2005). Improving entry for Hispanic students requires an awareness of existing issues on true access as well as the on- and off-campus experiences that impact the persistence of this group. An understanding of the multi-faceted components of Latino students attending community colleges and less than selective four-year institutions regarding the differences in college experiences is vitally important (Castellanos & Jones, 2004).

Based on data from the National Educational Longitudinal Study (NELS), Swail, Cabrera, Lee and Williams (2005) noted considerable variation between Hispanic and White students as regards their pre-college academic preparation with Hispanics having: (1) a higher number of remedial courses taken, (2) lower scores on the college qualification index, (3) a non-college preparatory curricula, (4) limited placement in advanced courses, and (5) a lack of testing for college placement. The lack of preparation for college was apparent; only 12 percent of Latino students scored in the top quartile of the NELS reading and mathematics tests compared to roughly 33 percent of White students. Scores on the College Qualification Index revealed a 19 percent gap between Latino and White students. The lack of an appropriate academic preparation for college highlights the fact that not only do so few Hispanic students go on to college but that

the majority of those Hispanic students will be found in community colleges and less than selective four-year institutions. Schmidt (2003) points out that scores are lower on standardized college-admission tests for this group of students and they require more remediation upon entering college.

As previously mentioned, Latinos tend to choose less selective colleges and universities (Pew Hispanic Center, 2005). Hurtado, Inkelas, Briggs, and Rhee (1997) investigated differences in college access and the choices different racial/ethnic groups make in selecting a college to attend. Based on data from the National Educational Longitudinal Study (NELS:88/92) and the Beginning Postsecondary Student Longitudinal Study (BPS:90/92), Hurtado et al. (1997) found major differences in the number of colleges students applied to, preparation behaviors, and the decision to attend their first-choice institution. As a group, Latino students applied to fewer colleges; were less likely to participate in an extensive search and college choice process; had the lowest goal aspirations; and were less likely to enroll in college immediately following graduation.

Immerwahr (2003) identified several impediments encountered by Latino students in choosing a college to attend: (1) a general lack of knowledge concerning higher education, (2) lack of appropriate information regarding admissions requirements and financial aid, and (3) having to make a decision among competing options. Hispanic students who failed to receive enough guidance from parents or counselors were misinformed about higher education and, consequently, were likely to make poorly informed choices. For some Latinos, the availability of rival options kept them from considering college as many of the students interviewed were already offered full-time employment or military service that were perceived as more attractive in the short-term.

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Examining the choice between attending a four-year institution versus a community college, Arbona and Nora (2005) found that Hispanic males were more inclined to attend a community college while females were more likely to enroll at a four-year institution. The choice of which type of institution to attend was also dependent on parental expectations. Students whose parents had low expectations that their children would attend college were twice as likely to enroll in a community college as opposed to a four-year higher education institution. However, two factors overwhelmingly predicted enrollment in a four-year college: (1) taking a pre-calculus or calculus course while in high school (3.98 times more likely) and (2) knowing that the majority of one's friends also planned on going to a four-year institution. The authors concluded that the choice to attend a four-year institution by Hispanic students is impacted more by the academic curriculum they took in high school, and the degree to which they perceived themselves as having the academic capital to go to college, than by parental expectations.

Nora (2003) examined the influence of *habitus* and social capital within the context of both persistence and college choice theories. The results of testing a holistic model of student college choice and persistence were especially strong regarding the impact of psychosocial factors, specifically *habitus*. All things considered, the findings established that when it came to choosing a college to attend, Hispanic students take into consideration such factors as comfort within the university, the perception that they will be accepted by students, faculty and staff and the degree of fit between them and different aspects of the institution.

Sadly, there are no large national databases that specifically focus on Latino high school students, those graduating and enrolling in higher education, and those persisting to undergraduate degree attainment. Data on Hispanic college students is either missing or limited in such datasets as the U.S. Census (2000), the Cooperative Institutional Research Program's (CIRP) Freshman Survey (1971-2005), and those collected by the National Center for Education

Statistics (NCES). While more and more information on students is becoming known (e.g. Bui, 2002; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996; Tym, McMillion, Barone, & Webster, 2004; Saunders & Serena, 2004; Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007), data on minority subgroups is deficient or non-existing.

Sample and Data

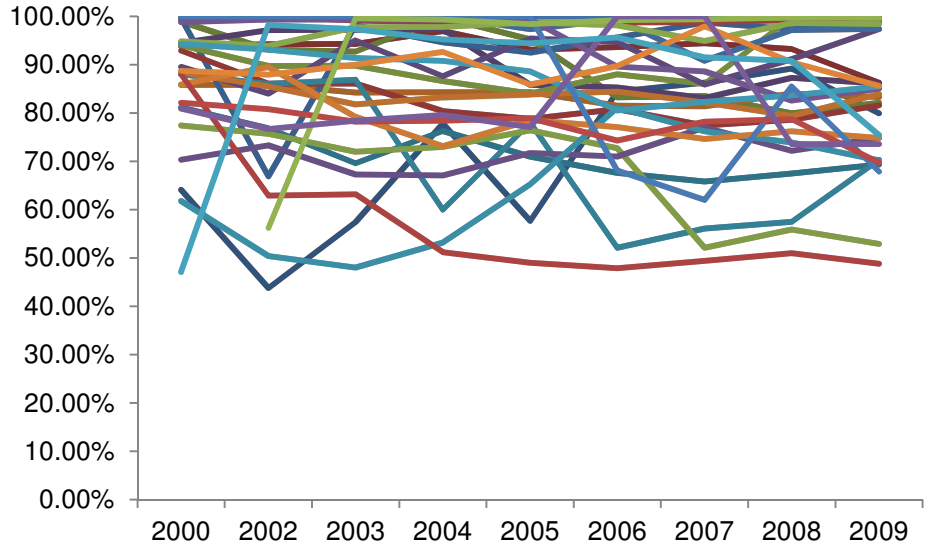
The initial findings presented in this draft of the study utilize Texas Higher Education Coordinating Board panel data that track the six-year graduation rates of matriculating first time in college (FTIC) cohorts by institution. Specifically, this descriptive discussion focuses on FTIC cohorts 2000, 2001, and 2003[1]. Subsequent work will draw further from on a unique and substantial set of linked databases made available through the University of Texas at Austin's Education Research Center (ERC). In particular, we use data for cohorts of first-time-in-college undergraduates enrolling in a Texas public community college or university (excluding UT Austin and A&M) in Spring 2000, Summer 2000, or Fall 2000. Following these cohorts allows for at least an eight-year tracking of the pathway to degree completion.

Initial Results

In order to understand the descriptive patterns of completion in comparison, the paper first attends to the notion of access, and preliminary findings suggest several important links between community colleges and their less-selective four-year counterparts. Community colleges are transparently open enrollment institutions, and, as Figure 1 suggests, the vast majority of less-selective four years are similarly described. Among the less selective four years, most have admission rates well above 70 percent.

[1] Viable data for this study were not available for Fall 2002 FTIC cohorts.

Figure 1: Less-Selective Texas Four-Year Institution* Acceptance Rates, 2000-2009

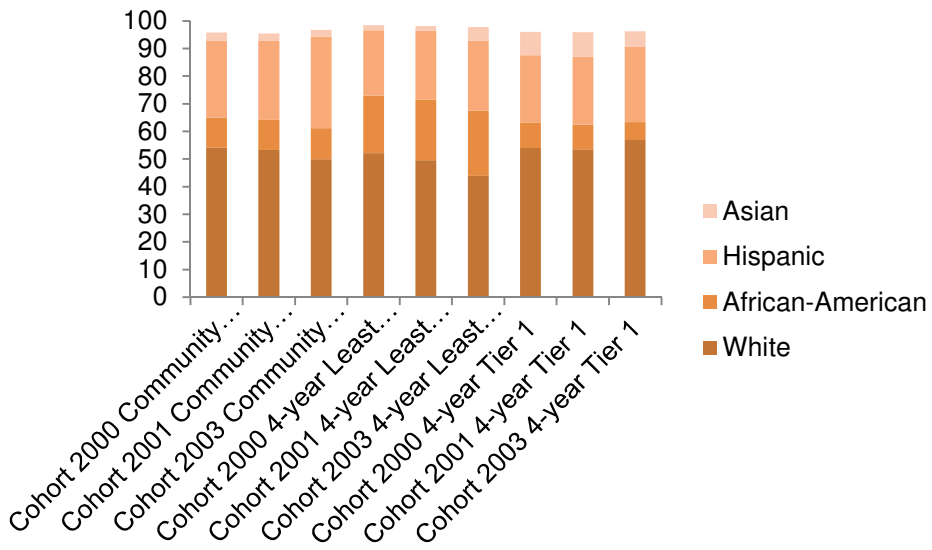


*This description includes all Texas 4-year campuses for which full data were available excluding the University of Texas at Austin and Texas A&M.
Source: Texas Higher Education Accountability System (n.d.).

The racial/ethnic makeup of the matriculating cohorts of the community and four-year colleges also reflect generally similar distributions. Figure 2 presents the student ethnic composition, by institution type, for matriculating 2000, 2001, and 2003 cohorts. The figure further disaggregates four years into emergent Tier 1[2] and least selective institutions. Broadly described, White students are similarly represented across all three institutional types. The most notable differences in racial/ethnic distributions are seen across African Americans and Latinos attending different campus types. African Americans comprise relatively larger proportions of matriculated students at the least selective four year institutions than at community of emergent Tier 1 institutions. Differently, Latinos comprise relatively larger proportions of students enrolled at community colleges.

[2] Seven institutions in the state are vying for Tier 1 (flagship) status alongside University of Texas at Austin and Texas A&M: Texas Tech University, University of Houston, University of North Texas, University of Texas at El Paso, University of Texas at San Antonio; University of Texas at Dallas, and the University of Texas at Arlington. For further discussion, see Hamilton (2010).

Figure 2: Racial/Ethnic Distribution of Entering Cohorts, By Institution Type and Emergent Tier 1 Status



Data source: Texas Higher Education Coordinating Board (2011).

In considering outcomes of interest, in this case six-year graduation rate with a baccalaureate degree, Figures 2 and 3 present six-year graduation rates for 2000, 2001, and 2003 students matriculating at both less-selective four-year institutions and community colleges in the state.

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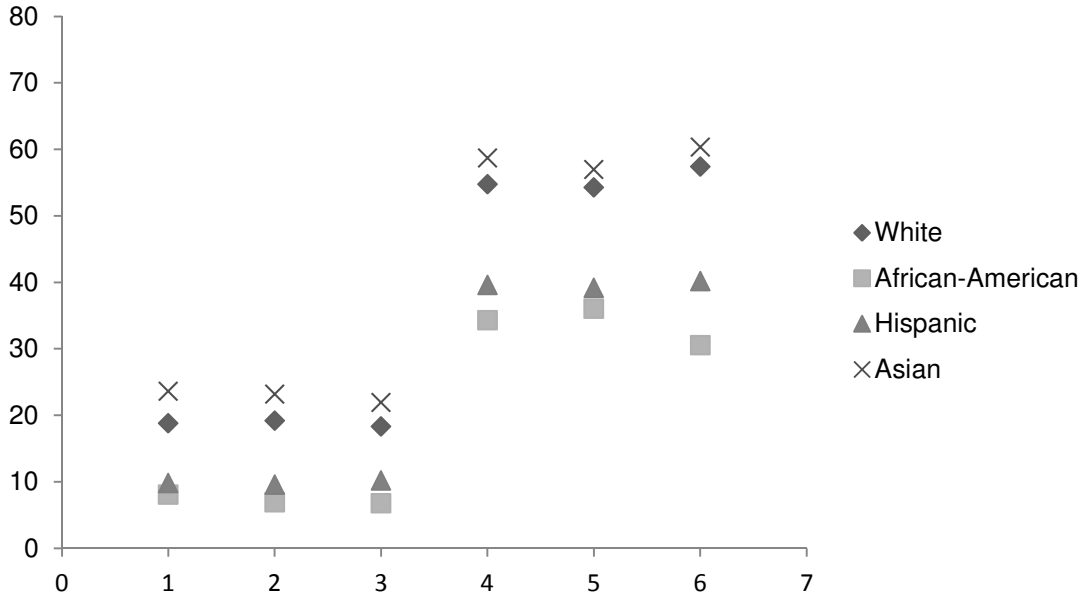
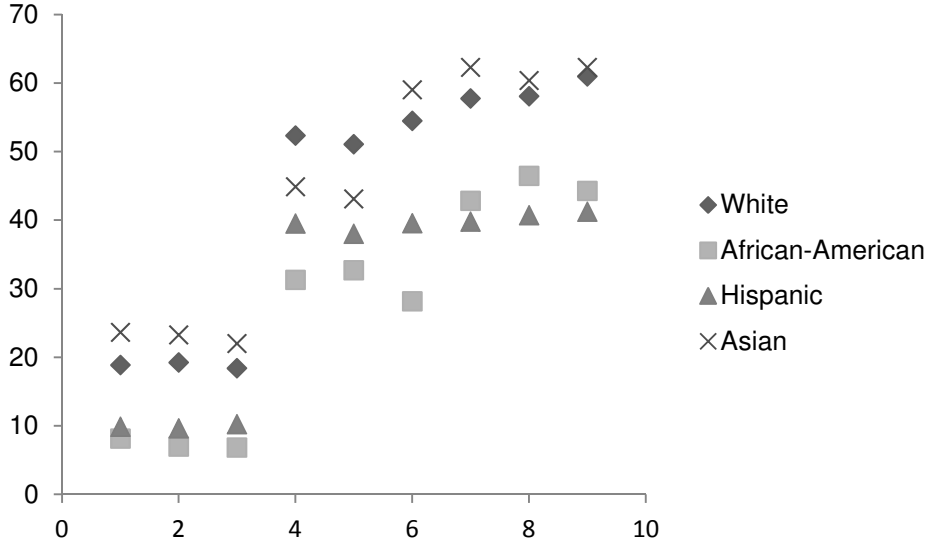
Figure 3: Six Year BA Completion Rate, By Cohort, By Matriculating Institution Type*, By Race/Ethnicity



Data source: Texas Higher Education Coordinating Board (2011).

*This description includes all Texas 4-year campuses for which full data were available excluding the University of Texas at Austin and Texas A&M.
Source: Texas Higher Education Accountability System (n.d.).

Figure 4: Six Year BA Completion Rate, By Cohort, By Matriculating Institution Type and Emergent Tier 1 Status, By Race/Ethnicity



Data source: Texas Higher Education Coordinating Board (2011).

Perhaps not surprisingly, six-year BA graduation rates are generally higher at four-year institutions than for students who begin their work at a community college. That said, it is interesting to note that overlap does exist in the distribution of graduation rates across campuses of all types, but most specifically least selective and emergent Tier 1 institutions (labeled 8-10 on the X axis). This overlap is particularly true for Latino students in the cohorts. Inferential analyses on the hypothesized multi-level model are needed to understand more clearly important campus-level nuance in student-level outcomes.

Next Steps In Analysis

In order to test the extent to which selection of a community college versus a less-selective four-year institution as point of entry was associated with outcomes of interest (specifically attainment of a Bachelors degree and time to degree attainment), the non-equivalency of groups being compared in this study will first be addressed in order to control for the influence of selection bias on the derived results. Toward that end, several approaches will be employed. Logistic regression models will be developed where propensity score estimates of the conditional probability of receiving treatment were calculated. As Shadish, Cook, and Campbell (2002) describe, "the goal is to include all variables that play a role in the selection process (including interactions and other nonlinear terms…) and that are presumptively related to the outcome, even if only weakly so…." (p. 162). Equation 1 represents this process at its simplest, where W_i is the binary treatment condition ($W_i = 1$ if participant is in the treatment group, in this case attendance at a less-selective four-year institution, and $W_i = 0$ if in the control group) and x_i represent a set of conditioning variables. In the case of this study, included among those variables are conditions such as prior academic performance (as measured by test scores), demographic variables, etc…., as partially represented in Table 1.

$$P(W_i | X_i = x_i) = \frac{1}{1 + e^{-x_i \mathrm{B}_i}} \quad (1)$$

The calculated propensity score will then used for optimal matching, a process by which the total sample distance of propensity scores is minimized (Guo & Fraser, 2010). These newly matched data will be used to assess differences in outcomes between students beginning their postsecondary education at a community college relative to those beginning at a less-selective four-year campus.

In particular, two sets of postmatching analyses will be run to understand the net influence of the decision of which type of campus to initiate postsecondary education and Bachelors degree completion and time to degree. The model represented by equation 2 demonstrates the generalized overall analytic strategy of estimation of student-level probabilities of college completion. The dichotomous outcome, Y_{jt}, represents whether student *j* at time *t* completed a Bachelors degree within six years following matriculation, where 1 indicates completion, 0 indicates absence of that condition. The key variable of interest is INTCAMP, which represents the initial entry campus type.

Multi-Level Model:

$$\text{Prob}[Y_{jt} = 1] = \frac{1}{1 + \exp[-(\pi_{0\mathrm{j}} + \pi_{1j} INTCAMP_{tj} + \pi_{2j} X_{tj} + \varepsilon_{tj})]} \quad (2)$$

The estimated parameter π_{1j} represents, on average, whether a student's probability of completing a degree increased or decreased depending on campus type. The level 2 (between schools) model tests whether differences in student outcomes are attributable to the

characteristics of the particular college or university they attend or are distributed evenly across all school types (see Equation 3).

Level 2 Model (with covariates):

$$\pi_{0j} = \gamma_{00} + \gamma_{0i} + \varepsilon_{0j} \qquad (3)$$

$$\pi_{1j} = \gamma_{10} + \gamma_{1i} + \varepsilon_{1j}$$

In these equations, γ_{01} and γ_{11} represent random effects and the ε values are residuals.

These models represent the simplest of myriad outcomes, particularly for community college students who have multiple alternate pathways (e.g., Associates Degree). To better account for the contribution of such choices, analyses will condition outcomes on bachelor's degree expectation. To the extent that data will support it, the analyses will also test outcomes comparing only four-year students with those who are most likely to transfer from a community college. Together results from these analyses allow us to establish whether initial decision making on type of campus has an effect on student outcomes, a set of findings especially critical for students who are financially or otherwise constrained in their options.

Policy Implications and Conclusion

Increasingly, calls are being made for systematic research on the contributions to college completion and time to degree. While descriptive data reveal that persistence rates and times to degree completion vary within and between colleges and universities, we can only speculate as to the variation in contribution of the less selective four-year institutions relative to community

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colleges toward degree completion of Latino students. Bound, Lovenheim, and Turner (2009) have provided provocative evidence on the net contribution of postsecondary entry through the community college relative to the less-selective four-year institution. This work extends that study through use of an expansive contemporary database. Moreover, Texas as a state provides an important lens through which to understand these issues. It's demographic and policy trends continue to be leading indicators of what much of the rest of the country will grapple with subsequently.

The loss of students who might be able to successfully complete a degree given the right point of entry is costly to both individuals and to the state. This study could directly help to inform state access strategies by providing direct evidence of the effects of college type on attainment. Further, the results could indirectly help policy makers as they consider how to increasingly support campuses that are facilitating student success. In sum, we hope that the findings from this study will contribute to our collective understanding of the kinds of postsecondary choices that can increase college persistence and reduce the time to degree attainment for Latinos.

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