

# **Why are Men Falling Behind? Gender Gaps in College Performance and Persistence**

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This paper examines the male disadvantage in grade point average (GPA), credits earned, and persistence in college. We use data on enrollees in Florida and Texas four-year colleges to decompose gender differentials in the 1st semester, changes in the differentials between semesters, and persistence through college. We find that males earn lower GPAs and credits in their first semester of college largely because they enter college with lower non-cognitive skills, captured by lower high school grades. After the first semester, males fall further behind their female counterparts in grades and credits. Some of this widening disparity continues to be explained by females' higher non-cognitive abilities, yet gender differences in college course-taking and majors also plays a substantial role in explaining gaps in credits, grades, persistence, and graduation.

Keywords: Higher education, gender differences  
JEL Classifications: I23, J16

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We thank Marta Tienda, Eric Furstenberg, and Eric Grodsky for helpful comments as well as participants at the Texas Higher Education Opportunity Project Research Workshop at Princeton University and The City University of New York Office of Academic Affairs. We are also grateful to the Florida Department of Education for making the Florida data available and to the Texas Higher Education Opportunity Project for making the Texas data available. Funding for this project was provided by the U.S. Department of Education's Institute of Education Sciences. Ana Karruz, Danielle Fumia, and Jason Williams provided excellent research assistance. Both authors contributed equally and all errors and oversights remain our responsibility.

## **Why are Men Falling Behind? Gender Gaps in College Performance and Persistence**

### **1. Introduction**

The gender gap in post-secondary education has taken a remarkable turn. Males' share of total college enrollment has fallen steadily from 71% in 1947 to 43% in 2005, with 1978 the last year that males held an advantage (see Figure 1 derived from data in Snyder, Dillow, and Hoffman 2008). Males also complete college at lower rates than females; 42% of bachelor's degrees went to men in 2005-06 despite males comprising 46% of freshmen in 2002, suggesting that males fall behind even after they have made the initial decision to obtain a college diploma (Snyder, Dillow, and Hoffman 2008). Gender differences in college enrollment are problematic for college administrators who seek gender-balanced student populations (see, for example, Gibbs 2008). In addition, while males remain overrepresented in several high-wage occupations and industries (Blau 1998), the growing female advantage in college completion is likely to imbalance the labor market in new ways.

The empirical literature has not kept pace with this reversal in gender disparities at the post-secondary level. Only a few studies explore why males fall behind their female counterparts in college enrollment, and even fewer examine the completion disparity. All of the enrollment gap studies document females' higher high school grades and reported post-secondary ambitions (Jacob 2002; Peter and Horn 2005; Reynolds and Burge 2004; Riegle-Crumb no-date). High school grades tend to explain more of the enrollment gap than performance on academic proficiency exams, which have led some to conclude that females have higher non-cognitive skills, such as organization, dependability, and self-discipline (which are captured in grades once performance on academic exams is held constant) that increase their access to college (Jacob 2002). The completion gap research (which tends not to condition on the decision to enroll) points to gender differences in expected returns to a college diploma, where returns are sometimes defined broadly to include

marriage markets (Charles and Luoh 2003; Diprete and Buchmann 2006). Yet the persistent female advantage *conditional on college enrollment* suggests that expected premiums to a college degree can only partially explain completion disparities. Open questions remain regarding the relative contribution of family background, pre-collegiate preparation, and college experiences—university attended and courses selected, as examples—to gender differences in college performance and persistence.

This paper aims to answer these questions. We use administrative data on enrollees in Florida and Texas 4-year institutions to examine and explain gender differences in grade point averages (GPA), college credits, and persistence. We find that males take fewer credits and earn lower grades than females in their first semester of enrollment. Male students are also less likely to persist and graduate from college and earn fewer cumulative credits and lower cumulative grades. The male-female differentials are not generally driven by differences in demographics, the quality of high schools and neighborhoods, high school test scores, or the selectivity of the university attended by male and female college enrollees. In fact, many of these factors tend to favor male enrollees. Instead, male enrollees have lower high school grades upon college entry, and this single factor (controlling for test scores and other factors) explains approximately three-quarters of the gender differential in credits earned and GPA in the freshman year. Males' disadvantages in the first semester of college, coupled with their higher propensity to take more difficult college courses, also explains a large share of their relatively poor performance in later semesters and their lower rates of persistence.

## **2. Prior Research on Gender Gaps in Postsecondary Education**

Relatively little research has explored why men fall behind at the postsecondary level, and the research that does exist focuses almost exclusively on college enrollment or college completion. Research on disparities in credits and grades earned along the way is sparse, despite evidence of

additional labor market responsiveness to grades and total credits, even conditional on completion (Jones and Jackson 1990; Kane and Rouse 1995). Prior studies of female advantages in college enrollment find that they have higher high school grade point averages than men, are more likely to graduate from high school, and more likely to take rigorous course loads while in high school (Peter and Horn 2005; Riegle-Crumb no-date). Prior research also find that girls are advantaged in non-academic areas, such as parental, peer, and teacher expectations as well as non-cognitive skills, such as organization, self-discipline, attentiveness, dependability, and seeking help from others (Reynolds and Burge 2004; Riegle-Crumb no-date; Jacob 2002). Some have used the more easily observed high school grades as a proxy for these non-cognitive advantages, once academic test scores are held constant (Jacob 2002). In addition to increasing their likelihood of being accepted to a university, these non-cognitive advantages may also lower the psychic costs of schooling.

Standard human capital theory proscribes that the ability of college students to perform well and persist though school is determined by a variety of costs and incentives, all of which may differ for male and female enrollees. For instance, males are less likely to enroll in college, but those that do enroll score higher on high school achievement tests and the Scholastic Aptitude Test (SAT) than females, and require less remediation in college-level mathematics (LoGerfo, Nichols, and Chaplin 2006; Long, Iatarola, and Conger 2009; Rothstein 2004). At the same time, females are less likely to major in subjects with strict grading standards, such as mathematics and engineering (Turner and Bowen 1999). Females also attend colleges that have looser admissions requirements and higher admissions rates (Jacobs 1999). This partly reflects the fact that selective universities often have larger male-dominated engineering programs, and are less likely to accept part-time students who are disproportionately female (Jacobs 1999). The higher high school achievement scores of male entrants should lower the psychic costs of schooling relative to females, yet the less selective

institutions and majors chosen by females should lower their psychic and direct costs (through lower tuition), rendering the net effect of these two forces indeterminate.

The handful of studies that have explored female advantages in college completion rates tend to find that incentives due to shifting female premiums on college degrees may also be at work. Yet the incentives are not due to an increase in the wage premium on a college degree for women relative to men; in fact, with the decline of the manufacturing sector, the wage premium associated with completing more years of education and with attending a higher quality college have been rising faster for men than for women (Charles and Luoh 2003; Long forthcoming). Instead, Charles and Luoh (2003) suggest that greater variation in the returns to a college degree among men relative to women leads to greater uncertainty for men, which in turn lowers their educational attainment levels. Taking a slightly more social perspective, DiPrete and Buchmann (2006) suggest that the female advantage in college completion is more likely due to the male-female differential in what they refer to as "personal" returns to education, including a higher probability of marriage, a higher standard of living, and a lower probability of being poor. Neither the Charles and Luoh (2003) or the DiPrete and Buchmann (2006) papers examine college completion among college enrollees. Therefore, the importance of expected labor market returns relative to costs (direct, psychic, or opportunity) may be overstated because the gender gaps in labor market incentives should be relatively small among college entrants. To elaborate, gender differences in knowledge of the labor market should be smaller among college entrants (all of whom have made an initial decision to obtain a college degree) than among middle school or high school students. Differences in the rates at which males and females complete college may be due to changes in these perceptions of the labor market (e.g. males expectations of the returns to a college degree become more uncertain as they progress through college) or, more likely, to the unanticipated costs of college, both direct and psychic. By restricting

an analysis of college completion to those who have decided to enroll, we can better isolate the contribution of the costs of college to gender gaps.

Given the shortage of research on the reversal in the gender post-secondary education gap, we have much to contribute. First, by examining several measures of college performance, GPAs, credits earned, and college completion rates, we shed light on whether gender gaps are constant, growing, or diminishing during the students' years of college enrollment. Second, we control for many important determinants of college achievement that prior studies have omitted, including demographic background, educational needs, high school quality, performance on high school achievement exams, high school grades, college quality, and college major. Finally, we analyze two complementary, administrative datasets that track the census of college students in two large states throughout their college careers.

### **3. Data**

The first source of data comes from students who enrolled in one of Florida's eleven public 4-year universities in 2002-03 in the year immediately following their high school graduation. More specifically, the dataset consists of a census of Florida public 8th graders in 1997-98 plus any other student who entered this cohort given normal progression (i.e., new 9th graders in 1998-99 + new 10th graders in 1999-00 + new 11th graders in 2000-01 + new 12th graders in 2001-02). Students are followed through the 2004-05 school year, and we are able to follow students as they make movements across Florida's postsecondary public universities. For these students, we have complete high school and college transcript records, 10th grade test scores, demographic

information, and limited measures of employment while in college.<sup>1</sup> These data were supplied to the authors by the Florida Department of Education.

The second data source includes a census of enrollees at the following five Texas institutions: Rice University in 2000-01; the University of Texas (UT) at Austin in 1999-00; Texas Agricultural & Mechanical University (A&M) in 1999-00; the University of Texas-Pan American in 1999-00; and Texas A&M-Kingsville in 1998-99. Students at these universities are followed for six years (except for students at Rice and Texas A&M-Kingsville, who are followed for five years). For these students we have records on college credits earned, grade point average, declared major by term of enrollment, and college graduation. In addition, we have limited information collected on their college applications, including SAT/ACT scores, high school class rank, high school identifiers, advanced placement test taking and test passing indicators (for UT-Austin), high school extracurricular activities (for Texas A&M and Texas A&M - Kingsville), mother's and father's education (for UT-Austin), and parent's income (for UT-Austin and Texas A&M Kingsville). The Texas data were compiled and made available to the authors by the Texas Higher Education Opportunity Project ([www.theop.princeton.edu](http://www.theop.princeton.edu)).

These administrative datasets hold several important advantages over national survey data (e.g. National Educational Longitudinal Study). First, they offer large numbers of students attending individual postsecondary institutions, which allows us to conduct a more intensive probe than earlier studies, for instance, by including high school and university fixed effects. Secondly, since we observed students in each semester, we can evaluate how gender differentials evolve during the students' college careers. Third, these data provide insight into recent cohorts of college students,

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<sup>1</sup> We do not have 10th grade test scores for students who entered the Florida secondary system after the 10<sup>th</sup> grade (7% of students). A very small percentage of students (less than 1%) are missing data on high school rank percentile, age, or foreign-born status. We impute all missing values using multiple imputations by chained equations, creating five multiply-imputed datasets. We also have limited high school course-records for those students who were not observed in all four years of high school (for instance, those who entered the Florida secondary system in the 11<sup>th</sup> grade).

who are subject to current post-secondary and labor market conditions. The data are limited to just Florida and Texas, but 13% of U.S. freshmen enrollees in 2005 were located in these two states (Snyder, Dillow, and Hoffman 2008), making the results here relevant for discussions of gender gaps nationally. To be sure, each dataset has its limitations (for instance, our Florida post-secondary sample includes only students from public secondary institutions in Florida and our Texas data include a limited set of control variables), but together, they overcome several data weaknesses.

#### 4. Estimation Strategy

The precise right-hand side variables differ slightly according to the dependent variable and the sample of universities, but the general estimation strategy is as follows:

$$(1) \quad Y_{ihj} = G_i\beta_1 + \mathbf{A}_i\beta_2 + R_i\beta_3 + \mathbf{C}_i\beta_4 + \mathbf{X}_i\beta_5 + W_i\beta_6 + \mathbf{M}_i\beta_7 + \alpha_j + \nu_h + \varepsilon_i.$$

$Y_{ihj}$  is the outcome (GPA, credits earned, persistence to the junior year, and graduation) for student  $i$  from high school  $h$  in university  $j$ .  $G_i$  equals 1 if the student is male;  $\mathbf{A}_i$  is a vector of high school achievement test scores;  $R_i$  is the student's high school class rank percentile;  $\mathbf{C}_i$  is a vector of higher-level high school course-taking and/or performance variables;  $\mathbf{X}_i$  is a vector of other pre-collegiate background characteristics, such as race/ethnicity and eligibility for free or reduced-price lunch;  $W_i$  is whether the student earned wages while in college;  $\mathbf{M}_i$  is a vector of variables capturing the student's major or the types of post-secondary courses that the student attempted;  $\alpha_j$  is a vector of college campus fixed effects;  $\nu_h$  is a vector of high school fixed effects; and  $\varepsilon_i$  is an error term. We estimate Eq. (1) with ordinary least squares when the dependent variable is hours or GPA earned and probit specification when the dependent variable is persistence or graduation.

Each of the variables in this equation is expected to measure some portion of the costs and incentives males and females face in college, although they are not easily categorized as such. For example, pre-collegiate characteristics (e.g. poverty, race) and preparation (e.g. high school test



scores) measure students' ability to complete college-level material, the returns they expect, and the direct costs they face. In addition to capturing differences in the quality of the institutions students attend and the support they receive, the university fixed effects may also measure and control for some differences in the expected returns to the diploma. The same can be said for the post-secondary courses that students choose. The residual in Eq. (1) captures the usual list of suspects. Major possibilities include measurement error (for instance, if high school test scores do not fully capture cognitive ability) and tastes for schooling or education. Differences in preferences for schooling between male and female college enrollees who are otherwise equal on all observables could be attributed to any number of differences, such as family resources and expectations, biology, socialization, peer support, faculty mentoring, and perceived labor market returns.

We then decompose the portion of the gender gaps that are explained by the sets of observed covariates shown in Eq. (1), such as the difference between men and women in high school rank percentile. Assuming one vector of observable characteristics ( $Z$ ), our general equation is:

$$(2) \quad \Delta\mu_{(M,W)} = [\mu(Z_M) - \mu(Z_W)]\beta_M + \mu(Z_M)[\beta_M - \beta_W]$$

where  $\Delta\mu_{(M,W)}$  is the mean gap between men and women,  $[\mu(Z_M) - \mu(Z_W)]\beta_M$  captures the portion of the mean gap that is due to differences between men and women in their observable characteristics,  $Z$ ; and  $\mu(Z_M)[\beta_M - \beta_W]$  measures the portion of the mean gap that is unexplained. Eq. (2) uses the male coefficients, which tells us how much males would gain if they had the same observable characteristics as females yet kept the same estimated effect of each characteristic on the dependent variable. By substituting the female coefficients into Eq. (2), we learn how much of the gap would be altered if males had the same observable characteristics and estimated effects as females. We estimate our decompositions using both male and female coefficients.

In order to learn more about the within-college gender differences, we then examine gender gaps for eight institutions from Florida and Texas that vary substantially in their degrees of selectivity and racial composition of their enrollment (see Appendix Table 1). For our Texas institutions we are able to model whether the student completed college within five or six years in addition to the credits and GPA earned along the way. Our goal with these multiple dependent variables and institutions is to examine the full variation in the college gender gap, and its determinants, by university and state.

*A Note on Differential Self-Selection into College*

In our Florida sample roughly 49% of all 2002 high school graduates were male while only 40% of the fall semester 2002 4-year college entrants were male. Given the disproportionate share of females enrolling in college, one might be concerned that those males who do enroll may have some positive unobserved trait that prompts their enrollment. If so, and assuming this unobserved trait is positively correlated with college performance, then we would expect that the coefficient on Male from Equation 1 ( $\beta_i$ ) would be positive as it would absorb this latent positive male characteristic. However, when we estimate a probit model of college enrollment for the Florida graduating class of 2002, we were able to reduce the gender gap in enrollment to nearly zero when controlling for all of the observable pre-collegiate characteristics shown in Eq. (1)- specifically, 10<sup>th</sup> grade achievement scores, high school class rank, high school courses, demographics, and high school fixed effects. The male coefficient in an enrollment model without any covariates is -0.065; while in our more fully specified model with pre-collegiate covariates, the marginal effect of being male is reduced to just -0.009. Most of the enrollment gap is, in fact, due to female advantages on observable characteristics and little of the gender gap is based on differences in unobservables *conditional on observables*.

## 5. Results

Table 1 shows the mean GPA, credit hours, and 6th semester enrollment for students who enrolled in a Florida 4-year public institution in the fall of 2002 (N=25,612). The "overall sample" column refers to students who were enrolled in each semester, regardless of whether they were observed in previous or later semester (conditional on 1st semester enrollment). In the first semester, females earn an average GPA of 2.90 and males earn an average of 2.73 for a male-female differential of -0.17. The female GPAs rise slightly over the following five semesters, and gender gaps widens by a small amount. In addition to earning lower GPAs in each semester, males earn fewer credit hours and are less likely to remain enrolled; roughly 79% of the female freshman persisted to the 6th semester compared with only 74% of the male freshman. The credit hour gaps grows over time from -0.43 in the first semester to -0.79 by the last semester for a differential of 6.56 in cumulative credits through Spring of 2005.

The next two columns in Table 1 show the differentials in GPA, hours earned, and persistence among the 18,364 students who were continuously enrolled in each of the six semesters. Among this sub-sample of persisters, the GPA and credit hour gender gap is very small in the first semester, and smaller in each semester than it is among the overall sample. Yet the increase in the male-female differential is much larger among the persisters than among the overall sample, and by the 6th semester, the GPA and credit hour differentials among those who are continuously enrolled reaches parity with the differentials among the overall sample of students. This increased differential among the subset of students who do not dropout suggests that the disparities observed in the overall sample are not explained by males who arrive to school with a higher propensity for dropout. In fact, the relatively equal differential in the first semester combined with the large increase in the differential among the persisters suggests that somewhere between the 1st and 6th semesters, males who arrive with equal ability and propensity to persist lose their relative standing.

Table 2 provides results from three separate analyses that together explain gender disparities in first semester GPA. The first column shows the male-female differentials on all variables included on the right-hand side of the regressions (see Appendix Table 2 for the male and female means on these variables). The next three columns provide the results of GPA regressions for all students, then separately for males and females. The last two columns provide the results of our decomposition analysis.

We condition the first semester GPA regressions on the number of credits *attempted* in the first semester. Interestingly, there is no significant gender gap in the number of credits attempted in the first semester. Thus, the gender gap in the number of credits *earned* reflects a gender gap in completing courses with a passing grade. Looking back to their high school experiences reveals that male enrollees have higher 10th grade math achievement scores, but lower 10<sup>th</sup> grade reading achievement scores, and they are nearly five percentage points lower in their high school class rank distribution. Male enrollees are more likely to have taken advanced placement (AP) or international baccalaureate (IB) classes in math and science, but less likely to have taken an AP/IB English course. Finally, on demographics, males are more likely to be Asian (or white as shown in Appendix Table 2) and less likely to be black; are less likely to have received free- or reduced-price lunch during high school; but more likely to be older and to have some form of disability (i.e., "Non-Gifted Exceptionality"). In combination, the gender gaps in these characteristics do not provide a clear pattern of advantage for female students as several characteristics would seem to suggest male advantages (for instance, higher 10th grade math achievement scores and advanced math course-taking).

The next three columns in Table 2 provide regression results. With all controls, the gender gap drops by 60% to a differential of -0.068.<sup>2</sup> The coefficients on the college level determinants suggest that students who attempt more credits earn higher GPAs. All the high school and demographic variables have the expected influences on freshman GPA; for instance, high achievement scores, good grades, and more advanced courses associates with higher GPA, while free and reduced-price lunch eligibility associates with lower GPA. Yet the influence of these determinants of college performance differ for males and females. For example, the male and female coefficients on high school reading achievement scores, class rank percentile, and course-taking are comparable, while the positive relation between math achievement scores and college grades only holds for females. Also, males who were deemed limited English proficient at some point during high school earn *higher* college GPAs, while this relation does not hold for females.

The final two columns in Table 2 (the decomposition results) reveal that a single factor, gender gaps in high school class rank percentile, explains most of the gap in first semester GPA. If men earned the same grades as women in high school, the male-female differential in first semester GPA would decrease by 72.8% (using male coefficients). If men earned the same high school grades and converted their high school grades into college grades in the same way women do, the gap would shrink by 74.0%.

Male college enrollees come from high schools whose students earn higher GPAs in college. That is, male college enrollees are *advantaged* by the high schools that they attended relative to their

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<sup>2</sup> Since differences in observable characteristics favor female enrollees, and given their higher rate of enrollment in post-secondary institutions, we conducted a different thought experiment. Suppose that males and females with similar observable characteristics enrolled in four-year, in-state, public colleges at the same rates. What would the gender gap in first year GPA be under this scenario? To address this question, we ran a first-stage probit predicting the likelihood of enrolling in a Florida public four-year institution conditional on pre-collegiate variables ( $A$ ,  $R$ ,  $C$ ,  $X$ ) and high school fixed effects ( $v_h$ ). We then matched each male that attended college with a female (without replacement) based on their likelihood of enrolling. The matched sample consists of 10,249 male and 10,249 female students. For this matched sample, the gender gap in first semester GPA is -0.11 (2.85 for females versus 2.63 for males). That is, the gender gap is reduced 34% ( $1-0.11/0.17$ ) when matching on the likelihood of enrollment..

female college classmates.<sup>3</sup> If male college enrollees attended the same high school as female college enrollees, we would expect the first semester GPA gender gap to widen by 8.4% (using male coefficients).

Most of the other factors that we examined either had small effects on the college GPA gender gap, or favored males. For example, high school course-taking modestly favors males and would widen the gender gap by 3.1% (using male coefficients). Males advantage on math achievement scores does not explain the first semester GPA gender gap using male coefficients (since the coefficient on math scores for males is essentially zero). However, if males received the same return to math scores as females, the gender gap would widen by 5.6% if the gender gap in 10th grade math scores were eliminated. Put differently, if females catch-up on math scores to their male high school classmates, we would expect female college grades to improve and the college GPA gap to widen.

Together, these male-female differences on observables explain between 59% and 62% of the male-female differential in GPA (depending on whether male or female coefficients are used). The residual could be due to any number of uncontrolled factors, such as preferences for leisure time, family circumstances, amount of financial aid, amount of employment, types of classes taken in the first semester, and motivation to earn good grades in college.

We next evaluate the factors explaining gaps in cumulative credits earned through the sixth semester. The results are shown in Table 3 (results for other dependent variables will be summarized in Tables 4 and 5 to simplify the presentation). Data limitations prevented us from evaluating students progress in Florida universities past three years. However, cumulative credits

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<sup>3</sup> Male college entrants are, in fact, drawn from schools with lower shares of poor students, and higher test scores and graduation rates than female college entrants. Smaller gender disparities exist among the universe of high school graduates (see Appendix Table 2). Either college-going males disproportionately select into good high schools, or more likely, males need to attend good high schools in order to overcome their deficiencies on other observable characteristics in order to be motivated to attend college.

through three years is likely to be highly correlated with the student eventually graduating college; for the Texas universities that we discuss later, we find that gaps in cumulative credits through three years are mostly mirrored by gaps in graduation.

In this analysis, we condition on credits earned in the first semester and the share of credits earned in various subjects as a proxy for college major. Not surprisingly, there is a strong relation between the number of credits earned in the first semester and cumulative credits earned through six semesters; an additional credit earned in the first semester would predict an increase of 3.7 credits earned through six semesters. Moreover, one-quarter of the gender gap in cumulative credits can be explained by the gender gap in first semester credits earned. Gaps in high school class rank contribute an additional 19%.<sup>4</sup>

Interestingly, students with higher 10th grade math achievement scores earn *fewer* cumulative credits, and this relationship is true for both males and females. Thus, males advantage on math scores predicts fewer cumulative credits for males and partially explains the gender gap (7.6% using male coefficients). Students with higher 10th grade reading achievement scores also earn fewer cumulative credits, but the relationship is weaker. It is possible that students with high math ability leave Florida colleges in response to labor market incentives, or that they exit for higher quality private schools.

The remainder of Table 3 shows gender gaps in college course-taking. Males take more of their college credits in Business, Engineering/Computer Science, and Natural/Physical Sciences, while females take more of their credits in Education, Health, Humanities, Social Sciences, Social Work, and Communications.<sup>5</sup> The largest gender gaps are in Education, Health, Engineering/Computer

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<sup>4</sup> In results that are shown in Table 4b, and discussed subsequently, we show that gaps in high school class rank explain 86% of the gaps in first semester credits earned. Thus, the *total* contribution of gaps in high school class rank to gaps in cumulative credits is roughly 40% (i.e., 19% + 86% \* 25%).

<sup>5</sup> The omitted category includes courses that could not be classified into these primary majors, such as physical education courses, military education courses, and library and information studies courses. There was no substantial

Science, and Natural/Physical Sciences. Interpreting the regression coefficients in this table is somewhat challenging. As an example, suppose a student switched 100% of their credits from the omitted category (Other) to Education. We would expect this student to earn 34.7 additional credits. Now, compare this coefficient on Education (34.7) to those on Health (26.5), Engineering / Computer Science (10.1), and Natural / Physical Sciences (-10.5). Clearly, the subjects in which males are specializing produce fewer cumulative credits than the subjects in which females are specializing. This could be because students in these majors are required to take fewer credits in order to graduate: for example, at the University of Florida, Education majors are required to take more credits than Liberal Arts & Sciences majors.<sup>6</sup> Another possibility is that the material in some courses (e.g. those in Engineering / Computer Science and Natural / Physical Sciences) is so strenuous that students who take these courses are less likely to earn a passing grade. Overall, gender gaps in college course-taking subjects explain 28.9% of the cumulative credit gender gap using male coefficients (or 21.9% using female coefficients).

We have omitted from Table 3 other variables which were controlled for, including student's high school course-taking, race, and age; indicators of the student's free- or reduced-price lunch status, foreign born, limited English proficiency, non-gifted exceptionality, and worked during the years 2002-03 to 2004-05; and high school and university fixed effects. These factors contributed little; high school fixed effects had the largest effect, predicting a 2% widening of the cumulative credit gender gap if males and female college enrollees attended the same high schools. In total, these factors shown in the table and those not shown explain 68.4% to 78.6% of the cumulative credit gender gap.

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gender difference for this omitted category, which accounted for 3.5% of males' courses and 3.8% of females' courses respectively.

<sup>6</sup> *University of Florida 2002-03 Undergraduate Catalog* (<http://www.registrar.ufl.edu/catalog.html>)



In our final analysis, we examine all dependent variables separately across institutions from Texas and Florida. From Florida, we select the two flagship institutions, University of Florida and Florida State University, and Florida A&M University an historically black university. From Texas, we focus on the two flagship institutions UT-Austin and Texas A&M, as well as two less selective public institutions (UT-Pan American and Texas A&M Kingsville), and Rice University, a private and extremely selective institution with an average freshman SAT of around 1,400. UT-Pan American is located along the Mexican border and designated as an "Hispanic-serving institution".

Table 4a provides the first semester gender gaps at each institution in addition to the portion of the total gaps that are explained by various factors which are shown in Table 4b. The percentages reveal the amount by which the gender gap would change if males had the same characteristics as females but if the effect of each characteristic on the dependent variable remained the same (in other words, the decompositions use the male coefficients). Despite the vast differences across these eight institutions in their selectivity, the gender gaps in first semester grades are remarkably similar, ranging from 0.07 at the University of Florida to 0.29 at Texas A&M-Kingsville. To some degree it appears that more selective institutions have smaller first semester GPA gender gaps. With the exceptions of Rice and UT-Austin, we are able to explain 43% to 67% of these gaps using first semester credits attempted and pre-collegiate observable characteristics. For Rice and UT-Austin, these factors are not collectively able to significantly explain first semester GPA gender gaps.

For first semester credits, we see variance in gender gaps across institutions; significant female advantages are found at five of the eight institutions, while there are insignificant gender differences at Rice and UT-Austin, and significant male advantages in credits earned at Texas A&M-Kingsville. Excluding UT-Pan American, we are able to explain able to explain 27% to 65% of these gaps using pre-collegiate observable characteristics. For UT-Pan American, these factors are not collectively able to significantly explain first semester credits earned gender gaps.

In Table 4b we present the decomposition results for these outcomes. Notably, gaps in high school class rank percentile significantly explain gaps in first semester GPA, with a range of 27% at Texas A&M to 95% at the University of Florida. Likewise, with the exception of Texas A&M Kingsville, where males earned more credits in the first semester than females, gaps in high school class rank explain 32% to 117% of gender gaps in credits earned.

No other student characteristic has this strong or consistent relationship with gender gaps. However, there are some interesting individual results. For example, male advantages in 10th grade math achievement scores and high school courses for students at the University of Florida substantially lessen gender gaps in GPA and credits. Likewise, male advantages on SAT/ACT scores lessen gender gaps in GPA and credits at UT-Austin. Finally, at Texas A&M, 42% of the gender gap in first semester GPA can be explained by females earning more credits in the first semester. We have omitted from Table 4b the results for high school extracurricular activities (for Texas A&M and Texas A&M - Kingsville), student's race, parent's income (for UT-Austin and Texas A&M - Kingsville), parent's education (for UT-Austin), and student's free- or reduced-price lunch status, foreign-born status, age, limited English proficiency, and non-gifted exceptionalism (for Florida universities). These factors have mostly small and/or insignificant effects on gender gaps.

In Table 5a we show gender gaps in cumulative GPA and credits through three years, persistence (i.e., attending during the spring of the third year), and graduation for the Texas universities. Again we see significant female advantages in cumulative GPA ranging from 0.08 to 0.33 and credits ranging from 0.99 to 6.45. The gaps in cumulative credits were again insignificant at Rice and UT-Austin. At Texas A&M-Kingsville, we find that the male advantage in first semester credits disappears and becomes a significant male disadvantage by the end of three years. Additionally, we find significant female advantages in persistence at each of the Florida universities

(ranging from 2.5% to 7.0%) and graduation at each of the Texas universities (ranging from 5.4% to 11.1%).<sup>7</sup>

Table 5b shows the decomposition results for these outcomes. Gaps in cumulative GPA is largely explained by gaps in first semester GPA for each institution ranging from 12% to 89%. Gaps in cumulative credits attempted also significantly explains gaps in cumulative GPA at six of the eight universities, and explains 52% of the gap in cumulative GPA at Texas A&M. Students college course-taking or major choice significantly explains gaps in cumulative GPA at five of the eight universities, while gaps in high school class rank explains gaps in cumulative GPA at seven of the eight universities. This latter result is important: gender gaps in high school performance significantly presage gender gaps in college performance that arise after the first semester. Finally, differences in test scores explain very little of cumulative GPA gaps at these universities. We also control for a variety of other factors including whether the student worked for wages during the first three years of college (see the notes at the bottom of Table 5b). None of these other factors substantially explained gender gaps in cumulative GPA.

With the exception of Texas A&M Kingsville, the results for cumulative credits through three years are consistent with those for cumulative GPA, and are perhaps more striking. Gaps in credits earned in the first semester account for 10% to 36% of gaps in cumulative credits. Differences in college course-taking and major choice contain sizable predictive power, explaining 29% to 63% of gender gaps in cumulative credits. And, gaps in high school GPA again contribute 10% to 45%. Cumulatively, the factors that we control explain 59% to 133% of the gaps in cumulative GPA (see Table 5a). Texas A&M-Kingsville is notably different from the other institutions, as was previously noted, as males took more credits than their female classmates in the first semester.

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<sup>7</sup> In results not shown, with the exception of Rice, we find gaps in persistence at the Texas universities ranging from 1.6% to 8.8%. At Rice, we find males are slightly more likely to persist (0.8%) but significantly less likely to graduate within five years (6.1%).

For persistence at the Florida colleges, differences in college course-taking explain 31%-85% and gaps in high school class rank explain 30%-56% of gaps in persistence. At Florida State University, controlling for other factors, 10th grade math scores are negatively related to persistence and thus male advantages in 10th grade math scores explain 27% of the gender gap in persistence at FSU.

For graduation at the Texas colleges, differences in college major have strong explanatory power at UT-Austin and UT-Pan American, but do not explain gaps in graduation at Rice, Texas A&M, or Texas A&M - Kingsville. Gaps in high school class rank significantly explain 17% to 51% of gaps in graduation at four of the five Texas universities, Rice being the exception. At UT-Austin, controlling for other factors, higher SAT/ACT scores are associated with *lower* likelihood of graduation. Thus the male advantage in SAT/ACT scores at UT-Austin explains 15% of the gender gap in graduation.

To summarize, our analysis of gender gaps across eight institutions of differing quality, characteristics, and in two different states suggest two major findings: females outpace males in nearly all institutions and, with some exceptions, the drivers of the gaps are remarkably similar.

## **7. Conclusions**

After decades of research aimed at explaining why girls are less likely to enroll in college than boys, the attention has recently shifted to the relatively dismal performance of boys at the post-secondary level. The female advantage persists after enrollment, with females now graduating college at higher rates than males. In this paper, we examine what happens when boys and girls of equal prior preparation and family background reach the same college, where boys fall behind, and why. Specifically, we use administrative data on post-secondary entrants in two of the largest states in the nation—Texas and Florida—both to quantify gender gaps in college performance and to provide some explanations.

Given that females are more likely than males to enroll in college and, consequently, more likely to be drawn from lower levels of the unobserved motivation or ability distribution, it is not clear that females should still outperform males once in college. Our data suggest that, indeed, they do. Across all 11 public 4-year institutions in Florida, for instance, males earn 0.43 fewer credits than females in their first semester, and earn even fewer in later semesters, such that by the end of their sixth semester, males have a cumulative disadvantage of 6.6 credits. Males also earn lower grades than females in each year of college, with a gender GPA gap for Florida entrants of approximately 0.20 in each semester. In the five Texas universities that we examined for which college completion could be determined, males are also less likely to graduate.

To explain these differential outcomes, we estimate a series of regressions of gender gaps in outcomes for all of the Florida entrants and entrants into individual institutions. We begin our discussion with the factors that appear *not* to be driving the gaps. Among Florida entrants, we find that the gaps are mostly robust to controls for demographics (e.g. race/ethnicity) and educational needs (LEP and exceptionality), high school fixed effects, 10<sup>th</sup> grade achievement scores, and advanced high school course-taking. In fact, differences in 10<sup>th</sup> grade achievement scores and the high schools attended currently advantage males in college. In addition, the gaps are remarkably unaltered by the addition of college campus fixed effects.

Instead, what single-handedly substantially reduces the gap at all of these institutions are the gender gaps in high school class rank percentiles, a measure of their grades relative to their peers in their high schools. Females earn higher high school grades and class ranks, and these rankings are far more predictive of credits and collegiate GPA than any other variable in the model, including high school achievement scores. High school grades also substantially predict college-level cumulative grades and credits, controlling for first semester grades and credits. This finding is consistent with other research that points to the tremendous importance of high school grades and,

more generally, non-cognitive abilities in predicting success in post-secondary institutions and the labor market (Bowen and Bok 1998; Heckman and Krueger 2005).

We also find that males are disadvantaged by choosing majors associated with lower GPAs, lower credits, and lower rates of persistence. For instance, the courses that male college entrants in Florida take (which are disproportionately in Business, Engineering / Computer Science and Natural and Physical Sciences) explain 10% of their lower cumulative GPAs, 29% of their lower cumulative credits, and 28% of their lower likelihood of persistence, conditional on first semester performance. Finally, though we reduce the gaps substantially with our observables, we are unable to reduce them to zero in most cases. Thus, despite controls for backgrounds, educational needs, high school quality and performance, and college quality and major, males are still falling behind. There are several remaining explanations that we have not addressed. For instance, there is some evidence that females are more likely to apply for, receive, and respond to tuition and other post-secondary supports, which lowers the cost of school and may increase their probability of graduation (Angrist, Lang, and Oreopoulos 2006; Dynarski 2007). Others find that females have greater incentives to do well in college given male-female differentials in the stability or quality of the returns to a college degree (Charles and Luoh 2003; DiPrete and Buchmann 2006). Our findings suggest that either our measure of high school grades does not fully hold these factors constant, or that they grow over time. Put differently, females non-cognitive advantages (e.g. applying for financial aid) and incentives to attain may increase as they progress through school.

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Figure 1:

Male's Declining Share of College Enrollment and BA Completion

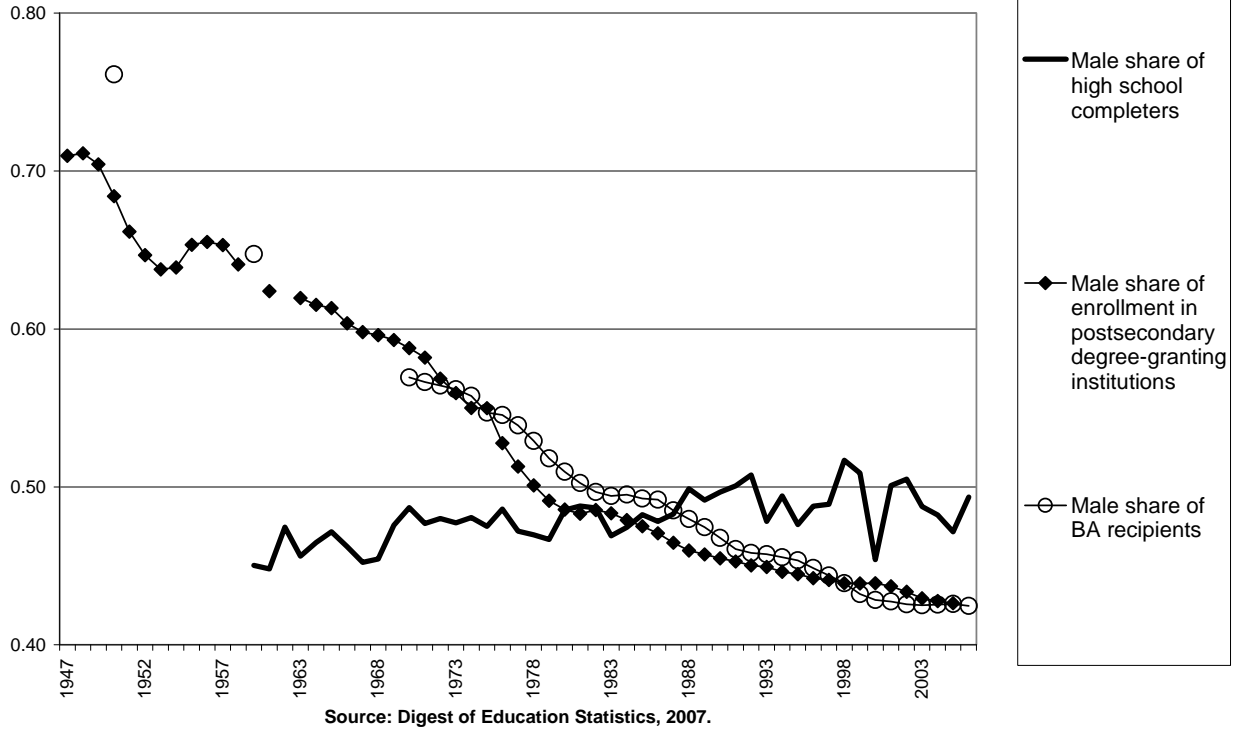


Table 1: Gender Differences in GPA, Credits Earned, and Persistence, All 11 4-Year Florida Public Universities

	Overall Sample		Continuously Enrolled Sample (N=18,364)	
	Female	Male-Female difference	Female Mean	Male-Female difference
<b>GPA</b>				
Fall 2002	2.90	-0.17***	3.11	-0.07***
Spring 2003	2.90	-0.19***	3.10	-0.09***
Fall 2003	2.92	-0.17***	3.05	-0.12***
Spring 2004	2.99	-0.19***	3.07	-0.15***
Fall 2004	3.06	-0.21***	3.11	-0.19***
Spring 2005	3.09	-0.21***	3.11	-0.20***
Cumulative through Spring 2005	2.89	-0.23***	3.11	-0.13***
<b>Credits Earned</b>				
Fall 2002	11.3	-0.43***	12.0	-0.07*
Spring 2003	11.7	-0.68***	12.4	-0.30***
Fall 2003	11.4	-0.58***	12.0	-0.35***
Spring 2004	11.4	-0.57***	11.8	-0.38***
Fall 2004	11.5	-0.93***	11.8	-0.85***
Spring 2005	11.6	-0.79***	11.7	-0.78***
Cumulative through Spring 2005	67.7	-6.56***	79.9	-3.64***
% who reach 6th semester	79%	-5.1%***		

NOTES: i) Both samples include students who graduated from a Florida public high school in 2002 and who enrolled in a Florida state university in the fall of 2002. The overall sample refers to students who were enrolled in the respective semester, regardless of whether they were enrolled in previous or later semesters. In the Fall of 2002, the overall sample included 25,612 students. The continuously enrolled sample consists of students who were enrolled in all 6 semesters. ii) \* p<.10; \*\*p<.05; \*\*\*p<.01.

**Table 2: Regression and Decomposition of First Semester Grade Point Average, All Florida Public Universities**

		Total Explained				
				62.2%***	58.9%***	
Grade Point Average: Females:		2.90				
Grade Point Average: Males:		2.73				
Raw Gender Gap =		-0.17***				
		Regressions			Decomposition	
Male-Female Difference in Observables		Overall	Male	Female	Using Male Coefficients	Using Female Coefficients
Male		-0.068*** [0.010]				
First Semester Credits Attempted	0.073	0.014*** [0.002]	0.015*** [0.003]	0.013*** [0.002]	-0.6%	-0.6%
Standardized 10th Grade Math	0.193***	0.029** [0.012]	0.002 [0.018]	0.049*** [0.016]	-0.6%	-5.6%***
Standardized 10th Grade Reading	-0.056***	0.087*** [0.012]	0.083*** [0.019]	0.088*** [0.015]	2.7%***	2.9%***
High School Rank Percentile	4.56***	-0.027*** [0.000]	-0.027*** [0.001]	-0.089*** [0.001]	72.8%***	74%***
High School AP/IB Courses:					-3.1%*	-1.5%
Math	0.090***	0.101*** [0.013]	0.121*** [0.021]	0.082*** [0.016]		
Science	0.069***	0.051*** [0.013]	0.059*** [0.021]	0.050*** [0.017]		
English	-0.057***	0.086*** [0.013]	0.086*** [0.022]	0.085*** [0.016]		
Social Studies	0.007	0.082*** [0.012]	0.097*** [0.021]	0.066*** [0.016]		
Foreign Language	0.002	0.034** [0.017]	0.063** [0.029]	0.017 [0.021]		
Race					0.6%	-0.7%
Black	-0.048***	-0.013 [0.019]	0.029 [0.034]	-0.031 [0.023]		
Hispanic	0.000	-0.011 [0.019]	-0.004 [0.030]	-0.019 [0.024]		
Asian	0.010***	-0.005 [0.022]	0.034 [0.035]	-0.039 [0.030]		
Free or Reduced-Price Lunch	-0.033***	-0.033** [0.015]	-0.010 [0.025]	-0.044** [0.018]	-0.2%	-0.9%**
Foreign-Born	0.003	0.053*** [0.018]	0.044 [0.030]	0.052** [0.023]	-0.1%	-0.1%
Age as of 2002	0.073***	0.012 [0.011]	0.011 [0.017]	0.014 [0.014]	-0.4%	-0.6%
LEP	0.000	0.058*** [0.023]	0.106*** [0.037]	0.03 [0.029]	0%	0%
Non-Gifted Exceptionality	0.020***	0.006 [0.031]	-0.007 [0.044]	0.03 [0.045]	0.2%	-0.3%
University Fixed Effect					-0.6%	-0.9%
High School Fixed Effect					-8.4%***	-6.9%***

Number of observations

25,612

10,249

15,363

Note: \*p<.10; \*\*p<.05; \*\*\*p<.01.

**Table 3: Regression and Decomposition of Cumulative Credits through Spring 2005 ("Sixth" Semester), All Florida Public Universities**

		Total Explained				
Credits Earned: Females:	67.7	78.6%***	68.4%***			
Credits Earned: Males:	61.1					
Raw Gender Gap =	-6.6***					
		Regressions			Decomposition	
	Male-Female Difference in Observables	Overall	Male	Female	Using Male Coefficients	Using Female Coefficients
Male		-2.2*** [0.3]				
First Semester Credits Earned	-0.43***	3.7*** [0.0]	3.8*** [0.1]	3.5*** [0.1]	24.6%***	23.1%***
Standardized 10th Grade Math	0.193***	-1.90*** [0.31]	-2.61*** [0.48]	-1.39*** [0.39]	7.6%***	4.1%***
Standardized 10th Grade Reading	-0.056***	-0.44 [0.27]	-0.59 [0.44]	-0.33 [0.35]	-0.5%	-0.3%
High School Rank Percentile	4.56***	-0.28*** [0.01]	-0.28*** [0.02]	-0.27*** [0.02]	19.2%***	19%***
Share of College Credits in:					28.9%***	21.9%***
Agriculture	-0.001	15.0*** [5.2]	21.3** [9.8]	9.4 [6.5]		
Architecture	0.000	8.2*** [3.1]	7.2 [5.1]	11.5*** [3.9]		
Business	0.015***	19.9*** [2.3]	25.1*** [3.5]	16.9*** [3.1]		
Education	-0.025***	34.7*** [2.6]	49.9*** [6.5]	33.3*** [3.3]		
Engineering/Computer Science	0.048***	10.1*** [2.5]	15.7*** [3.6]	3.8 [3.9]		
Fine Arts	-0.002	-6.7*** [2.4]	-8.2** [3.7]	-4.4 [3.3]		
Health	-0.028***	26.5*** [2.8]	40.0*** [5.9]	24.6*** [3.6]		
Humanities	-0.010***	-23.8*** [2.4]	-20.5*** [3.6]	-24.3*** [3.2]		
Natural/Physical Sciences	0.028***	-10.5*** [2.3]	-11.2*** [3.4]	-8.9*** [3.2]		
Social Sciences	-0.013***	-4.9** [2.4]	-5.7 [3.6]	-4.3 [3.2]		
Social Work	-0.006***	22.6*** [4.3]	49.2*** [11.6]	20.6*** [5.0]		
Technical/Vocational	0.000	38.4*** [3.0]	44.4*** [5.1]	36.7*** [3.8]		
Communications	-0.008***	31.8*** [3.1]	34.0*** [5.3]	32.0*** [3.9]		
Number of observations		25,612	10,249	15,363		

Notes: i) Regressions and decompositions also include: student's high school coursetaking, race, and age; indicators of the student's free- or reduced-price lunch status, foreign born, limited English proficiency, non-gifted exceptionalty, and worked during the years 2002-03 to 2004-05; and high school and university fixed effects. Full results are available from the authors. ii) \*p<.10; \*\*p<.05; \*\*\*p<.01.

**Table 4a: Share of First Semester Gender Gaps Explained at Select Florida and Texas Universities**

	N	Female Mean	Male Mean	Difference	Total Explained
<b>First Semester Grade Point Average</b>					
All Florida Public U's	25,612	2.90	2.73	0.17***	62%***
Rice Univ.	613	3.37	3.28	0.09*	25%
Univ. of Florida	5,091	3.30	3.23	0.07***	62%***
UT-Austin	7,222	3.04	2.89	0.15***	8%
Florida State Univ.	4,621	2.91	2.69	0.21***	51%***
Texas A&M Univ.	6,561	2.89	2.73	0.16***	62%***
Florida A&M Univ.	1,453	2.51	2.30	0.21***	67%***
UT-Pan American	1,537	2.22	2.00	0.22***	49%***
Texas A&M - Kingsville	1,092	2.53	2.23	0.29***	43%**
<b>First Semester Credits Earned</b>					
All Florida Public U's	25,612	11.35	10.92	0.43***	72%***
Rice Univ.	613	14.75	14.80	-0.05	--
Univ. of Florida	5,091	11.55	11.37	0.18**	65%***
UT-Austin	7,222	16.55	16.57	-0.02	--
Florida State Univ.	4,621	11.90	11.52	0.38***	57%***
Texas A&M Univ.	6,561	12.25	11.81	0.44***	40%***
Florida A&M Univ.	1,453	11.88	11.02	0.86***	64%***
UT-Pan American	1,537	6.81	6.49	0.32*	12%
Texas A&M - Kingsville	1,092	10.37	11.51	-1.14***	27%**

Notes: i) Decompositions use the male coefficients. ii) \*p<.10; \*\*p<.05; \*\*\*p<.10.

**Table 4b: Share of First Semester Gender Gaps Explained at Select Florida and Texas Universities**

*Share Explained By Gender Gaps in:*

	Credits Attempted (FL) or Earned (TX) in First Semester	SAT/ACT Score	10th Grade Math FCAT Score	10th Grade Reading FCAT Score	High School Class Rank Per-centile	High School Courses	High School Characteristics (or HS Fixed Effect for All FL U's)	University Fixed Effect
<i>First Semester Grade Point Average</i>								
All Florida Public U's	-1%		-1%	3%***	73%***	-3%*	-8%***	-1%
Rice Univ.	-5%	-4%			31%**		7%	
Univ. of Florida	3%*		-13%*	5%*	95%***	-25%***	-8%	
UT-Austin	0%	-26%***			54%***	-7%**	-11%***	
Florida State Univ.	-4%*		6%	3%*	47%***	1%	0%	
Texas A&M Univ.	42%***	-12%***			27%***		1%	
Florida A&M Univ.	6%*		0%	-1%	66%***	6%	-9%	
UT-Pan American	5%	-2%			43%***		3%	
Texas A&M - Kingsville	-12%*	3%			41%***		6%	
<i>First Semester Credits Earned</i>								
All Florida Public U's			-8%**	2%*	86%***	-7%**	-10%**	6%**
Univ. of Florida			-28%**	5%	117%***	-34%***	-13%	
Florida State Univ.			-3%	-1%	68%***	-4%	-2%	
Texas A&M Univ.		-11%***			43%***		-1%	
Florida A&M Univ.			0%	1%	63%***	2%	-9%	
UT-Pan American		-9%			32%**		-9%	
Texas A&M - Kingsville		7%*			-4%		0%	

Notes: i) Decompositions use the male coefficients. ii) Rice University and the UT-Austin are omitted from the First Semester Credits Earned decompositions as there were not significant gender gaps in first semester credits earned at these universities. iii) Regressions and decompositions also control for high school extracurricular activities (for Texas A&M and Texas A&M - Kingsville), student's race, parent's income (for UT-Austin and Texas A&M - Kingsville), parent's education (for UT-Austin), and student's free- or reduced-price lunch status, foreign-born status, age, limited English proficiency, and non-gifted exceptionality (for Florida universities). Full results are available from the authors. iv) \*p<.10; \*\*p<.05; \*\*\*p<.10.

**Table 5a: Share of Later Gender Gaps Explained at Select Florida and Texas Universities**

	N	Female Mean	Male Mean	Difference	Total Explained
<i>Cumulative Grade Point Average Through Three Years</i>					
All Florida Public U's	25,612	2.89	2.66	0.23***	75%***
Rice Univ.	613	3.42	3.34	0.08**	97%**
Univ. of Florida	5,091	3.31	3.18	0.13***	77%***
UT-Austin	7,222	3.01	2.80	0.22***	64%***
Florida State Univ.	4,621	2.94	2.66	0.28***	69%***
Texas A&M Univ.	6,561	2.96	2.75	0.21***	76%***
Florida A&M Univ.	1,453	2.37	2.09	0.27***	65%***
UT-Pan American	1,537	2.19	2.03	0.16***	113%***
Texas A&M - Kingsville	1,092	2.42	2.09	0.33***	72%***
<i>Cumulative Credits Earned Through Three Years</i>					
All Florida Public U's	25,612	67.74	61.16	6.57***	78%***
Rice Univ.	613	84.34	83.34	1.00	--
Univ. of Florida	5,091	78.50	72.74	5.76***	65%***
UT-Austin	7,222	75.94	74.95	0.99	--
Florida State Univ.	4,621	74.41	68.68	5.74***	90%***
Texas A&M Univ.	6,561	73.34	67.73	5.62***	59%***
Florida A&M Univ.	1,453	65.13	58.69	6.45***	133%***
UT-Pan American	1,537	25.84	22.55	3.29***	131%***
Texas A&M - Kingsville	1,092	50.07	44.00	6.07***	-24%
<i>Attended Any Florida Public 4-Year College in Spring 2005 ("Sixth" Semester)</i>					
All Florida Public U's	25,612	78.9%	73.9%	5.1%***	103%***
Univ. of Florida	5,091	91.3%	88.8%	2.5%***	61%*
Florida State Univ.	4,621	83.1%	78.2%	5%***	107%***
Florida A&M Univ.	1,453	76.8%	69.7%	7%***	136%***
<i>Graduated at this College Within Six Years (Five Years for Rice and Texas A&amp;M - Kingsville)</i>					
Rice Univ.	613	95.1%	89.0%	6.1%***	5%
Univ. of Texas	7,222	73.5%	64.2%	9.3%***	45%***
Texas A&M Univ.	6,561	83.4%	77.0%	6.4%***	25%**
UT-Pan American	1,537	16.4%	10.9%	5.4%***	90%***
Texas A&M - Kingsville	1,092	30.1%	19.0%	11.1%***	23%

Notes: i) Decompositions use the male coefficients. ii) \*p<.10; \*\*p<.05; \*\*\*p<.10.

**Table 5b: Share of Later Gender Gaps Explained at Select Florida and Texas Universities**

*Share Explained By Gender Gaps in:*

	GPA in First Semester	Credits Earned in First Semester	Cumulative Credits Attempted (FL) or Earned (TX) Through Three Years	Florida: Share of Courses in Major Areas; Texas: Major	SAT/ACT Score	10th Grade Math FCAT Score	10th Grade Reading FCAT Score	High School Class Rank Per-centile
<i>Cumulative Grade Point Average Through Three Years</i>								
All Florida Public U's	40%***		15%***	10%***		0%	1%***	15%***
Rice Univ.	69%*		6%	26%**	-2%			6%
Univ. of Florida	27%***		8%***	32%***		-5%**	1%	18%***
UT-Austin	38%***		3%	13%***	6%***			11%***
Florida State Univ.	41%***		11%***	16%***		0%	0%	7%***
Texas A&M Univ.	34%***		52%***	7%***	-5%***			10%***
Florida A&M Univ.	34%***		12%**	-9%		0%	6%**	24%***
UT-Pan American	89%***		11%**	4%	-3%			12%**
Texas A&M - Kingsville	12%***		12%***	10%	-3%			14%***
<i>Cumulative Credits Earned Through Three Years</i>								
All Florida Public U's		25%***		29%***		8%***	0%	19%***
Univ. of Florida		10%**		42%***		4%	-1%	16%***
Florida State Univ.		28%***		31%***		10%***	0%	13%***
Texas A&M Univ.		26%***		29%***	-4%**			10%***
Florida A&M Univ.		36%***		63%***		0%	-4%	29%***
UT-Pan American		25%*		56%**	1%			45%***
Texas A&M - Kingsville		-37%***		-17%	-6%			20%**
<i>Attended Any Florida Public 4-Year College in Spring 2005 ("Sixth" Semester)</i>								
All Florida Public U's				28%***		13%***	0%	56%***
Univ. of Florida				31%		-5%	-5%	56%***
Florida State Univ.				35%**		27%***	5%	41%***
Florida A&M Univ.				85%***		0%	-9%	30%**
<i>Graduated at this College Within Six Years (Five Years for Rice and Texas A&amp;M - Kingsville)</i>								
Rice Univ.				-9%	9%			9%
UT-Austin				27%***	15%***			25%***
Texas A&M Univ.				2%	1%			30%***
UT-Pan American				34%*	0%			51%***
Texas A&M - Kingsville				-4%	-8%			17%**

Notes: i) Decompositions use the male coefficients. ii) Rice University and UT-Austin are omitted from the Cumulative Credits Earned Through Three Years decompositions as there were not significant gender gaps in cumulative credits earned at these universities. iii) Regressions and decompositions also control for university and high school fixed effects (for All Florida Public U's), high school characteristics (for individual universities), high school courses (for Florida universities and the Univ. of Texas), high school extracurricular activities (for Texas A&M and Texas A&M - Kingsville), student's race, parent's income (for UT-Austin and Texas A&M - Kingsville), parent's education (for UT-Austin), and student's free- or reduced-price lunch status, foreign-born status, age, limited English proficiency, non-gifted exceptionalty, and an indicator for whether the student worked during the first three years after college entry (for Florida universities). Full results are available from the authors. iv) \*p<.10; \*\*p<.05; \*\*\*p<.10.



**Appendix Table 1: Selectivity of Florida and Texas Universities**

University	Barron's Guide Year	College Admissions Selector*	Median SAT Critical Reading	Median SAT Math	Median Composite ACT	Percent of Applicants Accepted	Percent White	Percent African American	Percent Hispanic	Percent Asian American	Balance: Percent Not Listed
Rice Univ.	1999	Most Competitive				27	80				20
	2005	Most Competitive				24	53		11	15	21
Univ. of Florida	1999	Highly Competitive	614	630	27	54	77				23
	2005	Most Competitive	625	642	27	48	76		13		11
UT-Austin	1999	Very Competitive	595	617	25	78	66		13	11	10
	2005	Highly Competitive	600	630	25	47	59		13	14	14
Florida State Univ.	1999	Very Competitive				73	76	11			13
	2005	Highly Competitive	590	600	25	59	71	12			17
Texas A&M Univ.	1999	Very Competitive	570	600		73	80		11		9
	2005	Highly Competitive	580	610	25	67	76				24
Florida A&M Univ.	1999	Competitive			20	67	10	86			4
	2005	Competitive				71		94			6
UT-Pan American	1999	Noncompetitive							87		13
	2005	Less Competitive			18	72			87		13
Texas A&M - Kingsville	1999	Less Competitive			17	69	29		62		9
	2005	Less Competitive					29		62		9

Source: 1999 and 2005 Barron's Profiles of American Colleges.  
 Note: Mean SAT Scores shown for UT-Austin for 1999.

**Appendix Table 2: Differences in Mean Characteristics of Florida High School Graduates and Enrollees at Florida Public Universities**

	High School Graduates			FL Public Univ. Enrollees		
	Male	Female	Sig. Diff.	Male	Female	Sig. Diff.
White	57.4%	55.3%	***	67.0%	63.0%	***
Black	21.2%	23.2%	***	14.0%	19.0%	***
Hispanic	17.7%	17.8%		13.0%	13.0%	
Asian	2.5%	2.4%		5.0%	4.0%	***
Received Free- or Reduced-Price Lunch	39.7%	40.3%	**	19.0%	23.0%	***
Age in 2002	18.72	18.54	***	18.38	18.31	***
Foreign Born	12.5%	12.9%	**	10.3%	10.0%	
Limited English Proficient	14.5%	14.4%		8.0%	9.0%	
Non-Gifted Exceptionality	17.1%	8.8%	***	4.0%	2.0%	***
Standardized 10th Grade Math Score	0.271	0.211	***	0.956	0.763	***
Standardized 10th Grade Reading Score	0.133	0.312	***	0.770	0.826	***
High School Class Rank Percentile	37.2	28.7	***	20.8	16.2	***
Took AP/IB Math Course	8.0%	8.6%	***	36.7%	27.7%	***
Took AP/IB English Course	8.1%	9.2%	***	35.9%	41.6%	***
Took AP/IB Science Course	8.7%	14.7%	***	33.6%	26.7%	***
Took AP/IB Social Studies Course	10.9%	15.2%	***	43.1%	42.4%	
Took AP/IB Foreign Language Course	4.3%	6.7%	***	14.8%	14.7%	
PSE Credits: Agriculture				0.5%	0.6%	
PSE Credits: Architecture				0.6%	0.6%	
PSE Credits: Business				7.5%	6.0%	***
PSE Credits: Education				0.8%	3.3%	***
PSE Credits: Engineering & Computer Sci.				7.2%	2.4%	***
PSE Credits: Art				6.2%	6.4%	
PSE Credits: Health				1.5%	4.3%	***
PSE Credits: Humanities				21.6%	22.6%	***
PSE Credits: Math and Science				28.5%	25.7%	***
PSE Credits: Social Science				18.1%	19.3%	***
PSE Credits: Social Work				0.2%	0.9%	***
PSE Credits: Technical & Vocational				1.3%	1.3%	
PSE Credits: Communications				2.5%	3.4%	***
Worked During First Year in PSE				70.8%	70.7%	
Worked During First Three Years in PSE				89.3%	88.9%	
High School's Percent FRPL	44.4%	44.7%	***	38.1%	39.1%	***
High School's Mean 10th Grade Math Score	0.018	0.022	**	0.171	0.150	***
High School's Mean 10th Grade Reading Score	0.014	0.020	***	0.159	0.142	***
Florida A&M University				6.0%	5.2%	***
Florida Atlantic University				6.1%	6.0%	
Florida Gulf Coast University				2.7%	2.5%	
Florida International University				7.8%	7.7%	
Florida State University				18.3%	17.6%	
University of Central Florida				16.0%	19.1%	***
University of Florida				19.6%	20.3%	
University of North Florida				5.9%	5.8%	
University of South Florida				15.3%	13.4%	***
University of West Florida				2.4%	2.4%	

NOTES: i) AP/IB refers to advanced placement or international baccalaureate. ii) "PSE Credits" is share of cumulative credits through the 6th semester. iii) \* p<.10; \*\*p<.05; \*\*\*p<.01.