

A STUDY OF A DEVELOPMENTAL READING CLASS
FOR HISPANIC MALES AT A TEXAS UNIVERSITY

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ABSTRACT

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Though developmental education has long been part of American post-secondary education, reliable evidence of its benefits, especially for ethnic minorities in reading, is lacking (Swail, Cabrera, Lee, & Williams, 2005). Developmental education has costs, however, in added tuition, time-to-completion, and discouragement (Bailey, 2009). Since Hispanic males are among the least likely students to achieve a post-secondary credential and among the most likely to be placed in developmental reading, policy-makers, practitioners, and students themselves need to know whether developmental reading is beneficial or detrimental to their success (Adelman, 2004; Clery, 2008).

This study examined whether developmental reading instruction improved the chances for underprepared Hispanic males to succeed in a four-year college. The study focused on students whose scores on a college-preparedness test identified them as needing additional reading skills for college success. The population for the study was drawn from Hispanic male students attending a moderately-difficult, selective, 4-year

public university in Texas during a ten-year period. Care was taken to compare groups of Hispanic males that exhibited comparable demographic and academic backgrounds as well as students who both passed and failed the developmental reading course.

The results indicate that the developmental reading course did not improve the success of Hispanic male students in college as measured by persistence and academic achievement except for the grade received in a reading-intensive gatekeeper course, which did show significant gains for students who took developmental reading.

Keywords: developmental, reading, Hispanic, gender, achievement, persistence, college

CHAPTER I

Introduction

This study will examine whether developmental reading instruction improves the chances for underprepared Hispanic males to succeed in college. Developmental education is a common institutional response to the appearance of underprepared students across the demographic spectrum in post-secondary schools, but whether the extra work actually helps is an open question. Considering that Hispanic males are among the least likely of all post-secondary student groups to earn a credential of any kind, it is important to understand whether this approach to helping them succeed is effective.

As a whole, over 80% of American 10th graders say their educational ambition is to earn at least a bachelor's degree (indicator 15, Conchas, 2001; Massey, Mooney, Torres, & Charles, 2007; Ogbu & Simons, 1998; Parsad & Lewis, 2003). Nearly a fourth will quit before finishing high school (Planty et al., 2008), but of the ones who do earn their secondary diploma about 75% eventually enroll at some type of post-secondary vocational school, two-year college, or four-year baccalaureate-granting institution (Adelman, 2004). Starting and finishing are not the same, though. Despite having a high school diploma, substantial numbers of students who go to college arrive academically underprepared. Calculations of just how many students need additional courses to learn basic skills such as math, reading, and writing vary widely: for 2-year colleges, estimates range from 41.9% (Snyder & Dillow, 2011) to 75% (Shulock, 2010), and in 4-year schools from 25.3% (Adelman, 2004) to 36.2% (Snyder & Dillow, 2011). In two-year

institutions, 15% of students identified as needing developmental work finish their developmental course sequence within the first year (Vandal, 2010). The cost to the public of this additional instruction has been calculated to reach \$2 billion annually, while students and families incur another \$700-\$800 million directly for tuition and fees (Strong American Schools, 2008). The indirect costs that this additional schooling inflicts by discouraging students from going to or staying in college, or by delayed graduation, foregone employment, thwarted dreams, and disrupted lives are incalculable.

As ever-larger proportions of the population have completed high school and entered college, and as issues of gender, race, ethnicity, social class, and equity have moved to the fore of political discourse, these efforts to help underprepared students complete their education programs have taken on social significance well beyond their academic function. For the nation, and particularly for Hispanics, the challenges loom large.

The place of Hispanics in American society is shifting rapidly. In the decade between 1990 and 2000, the Hispanic population in the United States grew nearly five times faster than the US population as a whole, overtaking Blacks as the second largest ethnic group, after Whites (Ramirez, 2004). In 2008, Hispanics made up slightly more than 15% of the population (U.S. Census Bureau), and by 2050 Hispanics are expected to comprise 25% to 30% of the American workforce (Natale, 2008; Tossi, 2006).

Educationally, at the national level, 11% of Hispanics earn bachelor's degrees, though nearly 20% of Blacks and 35% of Whites do so (Planty et al., 2008). Hispanic men, as is true of men generally, earn about one third fewer bachelor's degrees than do women of the same ethnic background (Snyder & Dillow, 2011; Vincent-Lancrin, 2008).

The number of Hispanic women entering college also continues to accelerate faster than

the number of men (Saenz & Ponjuan, 2008). Male Hispanic students are, consequently, among the least likely segments of the population to graduate with either a two- or four-year degree.

Such disparities have moral, economic, social, and political consequences that redound not just to the Hispanic men themselves, but also their families, communities, and the nation. Lower levels of education correlate with an array of social pathologies: lower incomes, higher unemployment (U.S. Bureau of Labor Statistics, 2011), poorer health, decreased longevity, less civic participation, more confrontations with the criminal justice system, (Seidman, 2005) and higher divorce rates (Bramlett & Mosher, 2002). Were Hispanics to graduate from college at the same rate as Whites, Hispanic poverty levels could shrink by half, with proportionate benefits to the Gross Domestic Product (GDP) and general tax revenues (Carnevale & Fry, 2001).

Failure to close this college education gap, says McClenny, is “dangerous . . . intolerable . . . [and] a blight on America’s future” (p. 13). It is a failure especially worrisome in a nation such as the United States, where education has not merely the usual social, economic, and political functions, but is also intimately affiliated with the nation’s understanding of itself (Carnevale & Desrochers, 2004; McClenny, 2004; Wells, 2008). In American society, Payne and Lyman (1997) write, education is “the great equalizer [I]n its romantic ideal, education embodies all that is best in American democracy because it holds the promise of equal opportunity for all who choose to participate” (p. 4).

Fresh starts and second chances in education, as in life, are also assumed in the American Dream (Burley, 2002; Carnevale & Desrochers, 2004; Martorell & McFarlin, 2007) because, as one visionary school superintendent wrote over a century ago, “your

bootblack to-day may be your lawyer to-morrow, and the railsplitter or the tanner or the humble schoolmaster at twenty years of age may become the chief magistrate of fifty millions of free people before he is fifty” (Ravitch, 2000, p. 19). For students who have, for whatever cause, not fared well before college, post-secondary schools are expected to extend financial, social, and academic support. Support through additional skills courses is routine, and Hispanic and Black students are disproportionate recipients of these services. Indeed, over 60% of Hispanics and Blacks are assigned to these preparatory classes, compared to fewer than 40% of White and Asian students (Adelman, 2004). Hispanics and Blacks, however, are also less likely to finish these courses than their White and Asian counterparts (Bettinger & Long, 2005b). Some data suggest minority students who take developmental courses have a 27% probability of graduating, versus 36% among Whites in the same courses (Boylan, Sutton, & Anderson, 2003). Such disparities and indications of educational failure suggest greater attention is due these classes for underprepared students.

Post-secondary Support

Scholars debate what to call the classes underprepared college students take in order to learn the basic academic skills they will need to succeed in standard undergraduate courses. Various names are used almost interchangeably—basic skills, compensatory education, developmental education, or remedial education. Whatever the designation, all are courses and programs that unready college freshmen turn to for instruction in the math, writing, reading, and occasionally, study and life skills they need for success in college-level study. Some authors differentiate between remedial and developmental or supplemental education, holding that remedial courses re-teach what a student has previously failed to learn while developmental and supplemental education

introduce new material (Illich, Hagan, & McCallister, 2004; Oudenhoven, 2002; Parsad & Lewis, 2003; Payne & Lyman, 1996; Roueche & Roueche, 1999). Others suggest that remedial is a pejorative term that may have a discouraging effect on students (e.g., Kozeracki, 2002).

Objections notwithstanding, remedial is the term most commonly used in the literature and in practice. It is also most descriptive of what actually happens (Payne & Lyman, 1996). Depending on the locale, tests used to place students in these classes may require no more than an eighth-grade level of competency (Calcagno, 2007) in skills universally taught in secondary school, so that remediation is truly the goal of the student and instructor. Where the emphasis is on teaching new skills, no bright line in the classroom segregates new material from what may have been previously taught but unlearned. If developmental is a less pejorative descriptor, it is not clear that students benefit when euphemisms mask the true state of their academic peril (Deil-Amen & Rosenbaum, 2002).

In this study, however, I will use the broader term, developmental education, as an umbrella covering all forms of post-secondary instruction intended to prepare a native-English-speaking student for regular undergraduate coursework. The reading program that is the subject of this investigation is course-based developmental instruction that teaches reading strategies for college study that are not commonly taught in secondary school and uses authentic materials from the texts of regular college classes, which are also new. This context more closely matches the meanings attributed to developmental education and justifies using the term in this paper.

While critics may suppose that developmental courses attest to declining standards in American schools, similar practices have been part of university curricula

since the 1600s, when Harvard supplied new arrivals with Greek and Latin tutors (Phipps, 1998). In the 1890s, one of the early school reform commissions, the Committee of Ten, stated plainly that high schools “do not exist for the purpose of preparing boys and girls for college” (Strong American Schools, 2008, p. 5), and, indeed, nearly 40% of college students of the era also began their college careers taking non-credit courses in preparation for regular college studies (Phipps, 1998). Even in the prestigious Ivy League schools most students at the turn of the century arrived underprepared (Payne & Lyman, 1996).

As in the past, college and university administrators continue to maintain that developmental education is among their best methods to improve student retention (Habley & McClanahan, 2004). Consequently, over three-quarters of American colleges and universities currently offer developmental classes (Snyder & Dillow, 2011).

Some proponents contend that the future of American higher education depends on nurturing these developmental education programs (Astin, 1998; Auerbach, 2002; Boylan & Saxon, 2010; McCabe, 2000; McClenny, 2004; Roueche & Roueche, 1999). They offer evidence, usually from small studies of individual programs, that developmental courses help students perform better than peers who do not take the courses and may even propel developmental course completers to match or surpass students not deemed at-risk (Fleischauer, 1996; Hodges, 1998; McCabe, 2000, 2003; Napoli & Hiltner, 1993).

These advocates differ, however, about the contexts in which developmental education succeeds. McCabe (2000, 2003), for example, argues for developmental education without distinguishing between methods or contexts. Others more cautiously claim developmental education bolsters academic performance if it is part of a holistic package of assistance addressing multiple needs, such as is offered by the federal TRIO

student support programs (Braunstein, Lesser, & Pescatrice, 2008; Gibson, 2003; National Association for Developmental Education, 2009; Ramirez, 2005; Sperling, 2009). A third camp suggests developmental education's benefits are situational: students attending a two-year college, where developmental education is commonplace, or taking a single math course may gain from developmental courses, while students attending a four-year school or burdened with multiple developmental courses are likely to either see no benefit or suffer negative consequences (Attewell, Lavin, Domina, & Levey, 2006; Horn, Chen, & Adelman, 1998). This situational benefit extends to the student's family and economic situations: students from low-income families whose parents are not well educated spend little time studying in high school but seem to do better in developmental education classes than classmates with higher incomes and better-educated parents (Hagedorn, Siadat, Fogel, Nora, & Pascarella, 1999). Such evidence suggests developmental education can benefit students whose deficits can be traced to poor learning environments, but makes little difference for those who have failed despite strong support. A fourth argument says developmental education benefits students who get high grades in their developmental courses but does little good, if any, for those who earn lower grades in those courses (Bahr, 2008; Bettinger & Long, 2004, 2005b; Perkhounkova, Noble, & Sawyer, 2005). Still others maintain that success hinges on the teaching methods and administrative structures employed (Boylan & Saxon, 2010; Rutschow & Schneider, 2011).

Ironically, the developmental courses put in place to help students succeed are also among the courses students are least likely to pass. Of students taking developmental math, 35% do not pass, and in developmental reading, 30% do not pass (Adelman, 2004). While 42% of all students in the NELS:88/2000 survey took at least

one developmental course, for students whose post-secondary careers ended with 10 or fewer credits the number rose to 74%. In another study of two-year colleges, fewer than half of students assigned to developmental courses finished their developmental work successfully, most simply never enrolling in the developmental courses to which they had been assigned (Bailey, Jeong, & Cho, 2008). Once students did pass their developmental courses, half went on to successfully complete a for-credit “gateway” course in the same discipline. Another indicator of developmental education’s problematic role in serving underprepared students was a finding that the average California community college student transferring to a 4-year school spent five years in the community college system but left with a single year’s worth of transferable credits (Melguizo, Hagedorn, & Cypers, 2008). These results and the aforementioned developmental course failure rates suggest that a primary function of developmental education may simply be to either cull students lacking the wherewithal to finish a college program or shunt them to less demanding schools and majors (Bailey et al.; Bettinger & Long, 2004; Deil-Amen & Rosenbaum, 2002).

The preponderance of the most comprehensive and methodologically sound research is ambivalent about developmental education outcomes. The more optimistic research finds that developmental education helps relatively few students or at least does no harm (Calcagno, 2007; Deil-Amen & Rosenbaum, 2002; Kreysa, 2006-2007; Martorell & McFarlin, 2007; Roksa, Jenkins, Jaggars, Zeidenberg, & Cho, 2009; Rutschow & Schneider, 2011; Strayhorn, 2006). Once high school experience is accounted for, the effects of developmental education seem to disappear for the general population (Adelman, 2004; Vegas, Murnane, & Willett, 2001). Whether or not the

generalization holds for specific sub-populations and specific programs is yet to be determined.

Developmental Reading.

Reading is not the most common developmental problem college students face, but it is the most severe (Adelman, 2004). Though fewer students are assigned to developmental reading than to math, and a greater percentage of reading students finish their developmental course sequence – 59% versus 33% in one study of two-year colleges (Bailey et al., 2008) – the consequences of reading so poorly as to be assigned developmental work are much worse. According to Adelman, 70% of students assigned to developmental reading earned no post-secondary credential whatsoever. Bailey et al. hold that among 2-year college students, 17% who ever take a developmental reading course earn a bachelor's degree, versus 27% of students who ever take a developmental math course. Perhaps because a reading deficit often signifies additional, more profound academic troubles, roughly 60% of students assigned to a developmental reading class three or more levels below college standards never bother to enroll in developmental reading (Bailey et al.). Two-thirds of students enrolled in developmental reading also have to take two or more developmental classes outside of reading (Adelman). Though one or two developmental classes may not, as a rule, harm a student's chances of graduating, the chance of graduation for a student starting with three or more developmental classes plummets below 9% (Parsad & Lewis, 2003). Since Hispanic and Black students are 50% more likely to be assigned to developmental course work than Whites or Asians (Adelman), the disparate impact on these minorities is great. Developmental reading, in short, represents one of the most formidable obstacles to college success that students and instructors ever confront.

Politicians nationwide have responded to such daunting reports about developmental education with legislation. Some states and localities have banned or restricted developmental course offerings in public colleges, demanded that students pay the full cost, or pressed high schools to pay for the developmental education costs of their graduates who go to public colleges and universities (Bettinger & Long, 2005b; Cronholm, 1999; Hagedorn et al., 1999; Oudenhoven, 2002; Shaw, 1997). Whatever the social, moral or ethical arguments, the politicians are not without reason: eighty percent of students in developmental courses claim to have finished high school with a 3.0 grade point average (GPA) or better (Strong American Schools, 2008).

As a result of this review of the literature, this study will examine those students who completed a state-mandated placement test and were placed into a developmental reading course (hereafter, the takers) and compare them to those who were placed in developmental reading but chose not to take the course (hereafter, the skippers), and those who passed the placement test (hereafter, the passers).

Gender Effects

By the early 1990s, the nation's massive efforts to eliminate racial and ethnic barriers to enrollment in higher education had largely succeeded. What racial and ethnic disparities remained were generally a product of economic disparities (Adelman, 2004; Cameron & Heckman, 2001). The biggest enrollment gap now is not between races and ethnicities, but between men and women. Since the late 1970s, enrollment for women has exceeded that for men, and at the undergraduate and graduate levels women now outperform men by almost every measure: high school rank, intensity of high school preparation, college GPA, college credits successfully attempted, rates of persistence and degrees earned (Planty et al., 2008; Snyder & Dillow, 2011; Topper, 2008). Women earn

three baccalaureate degrees for every two earned by men.¹ This trend has been especially pronounced among low-income minorities (Clery, 2008). Among Hispanics nearly 50% more women enroll in college than men and the gap is growing (Fuller, 2010). Women, and Hispanic women in particular, achieve these levels despite being placed more often than men in developmental coursework (Clery).

Gender differences also appear in the ways ethnic minority students respond to academic environments and their motivations as students. Self-esteem, for instance, has a greater influence on Hispanic males' adjustment to college than for females (Toews & Yazedjian, 2007). While African-American females are more inclined to see academic success as congruent with their ethnicity and community values, African-American male college students respond more to high-achieving role models (Oyserman, Gant, & Ager, 1995). In addition to gender, as these findings indicate, ethnicity and race also influence educational outcomes.

Ethnicity and Race

Ethnicity, race, and culture correlate with significant differences in college student experiences. By some measures, Hispanic high school graduates are more likely than Whites to go to college (Fry, 2002), and Hispanics exhibit higher levels of persistence than students from other ethnic groups facing similar obstacles to graduation (Strage, 2000). Strong cultural identity promotes higher levels of academic achievement for Hispanic students (Tossi, 2006), and familism—the priority given family in Hispanic culture—governs many students' decisions about whether to go to school, where to go, the level of commitment to academic studies, and when to leave school.

¹ Women's dominance in college is not just a US phenomenon, but is widely noted internationally as well (Higher Education Policy Institute, 2009; Snyder, Dillow, & Hoffman, 2008; Vincent-Lancrin, 2008).

Familism is generally considered to be a source of support and encouragement for Hispanic students (Cerna, Perez, & Saenz, 2009; Del Pilar, 2009) and can produce exceptional outcomes. Treviño (2000) describes several migrant families of Mexican origin who sent children to prestigious colleges and universities. Familism may also play a negative role in a student's efforts to study in college, as it entails obligations to support the family unit. Within Hispanic culture, college is also often regarded not as preparation for, but as a diversion from, assuming adult responsibilities and contributing to the family (Castillo, Conoley, & Choi-Pearson, 2006; Sy, 2006).

Being foreign-born of any nationality typically has a positive effect on credit hours earned, earning a degree, transferring from the two-year to four-year degree programs, and persistence in school (Bailey & Weininger, 2002; Leinbach & Bailey, 2006). Within ethnic groups, students born abroad who had completed high school before immigrating have different post-secondary outcomes than foreign-born students whose high school work had been finished in the US (Bailey & Weininger). Since nearly half of Hispanics in the US are foreign-born (U.S. Census Bureau, 2011), the impact of a student's place of nativity and pre-college education is relevant.

Other measures related to retention and developmental education differ among ethnic groups, too. The different motivations students bring to college affect persistence (Allen, 1999; Cabrera, Nora, & Casteneda, 1992; Nora, 1990). Different races and ethnic groups use campus student services differently as well (Del Pilar, 2009; Kearney, Draper, & Baron, 2006). Most relevant to this study, Black and Hispanic students are more often assigned to developmental reading than Whites or Asians (Adelman, 2004; Bailey et al., 2008).

While Tinto's student integration model has been criticized as inappropriate for minority students (Perrakis, 2003; Tierney, 1999), several studies demonstrate that the model remains relevant. Minority males who enjoy higher numbers of formal social and academic ties on campus, for example, are reported to earn higher grades than their less-well-connected peers (Baker, 2008; Benn, 2002; Fischer, 2007). This body of research bears out the significance of race, ethnicity, and culture on college student achievement.

Padilla (2007) and Oseguera, Locks, et al. (2008), argue that schools need to improve the cultural and ethnic "fit" between Hispanic students and their college environment. This goal is already substantially realized in the statistic that nearly half of Hispanic college students attend schools where Hispanic students constitute a least 25% of the student body.

In 2002, Benn wrote a dissertation examining the exceptionally high retention rates for minority Blacks at Generic University. For at least a decade, Black students at the school had been retained at rates superior to both Whites and Hispanics. Benn robustly affirmed Tinto's (1975, 1982, 1993, 2006) engagement principle, asserting that Blacks persisted to their second year because they were highly involved in a cultural enclave manifested in 1) community, 2) fitting in, 3) village, 4) involvement, 5) security, 6) solidarity, and 7) reciprocity. These seven components immediately linked the student to a community that provided cultural and personal validation, encouraged academic achievement, and imposed reciprocal obligations that discouraged leaving. Benn also concluded that the absence of an accessible Black community off campus was instrumental in making the enclave cohere (personal communication, September, 2008). Though Black retention rates did increase by 34% in the decade surveyed, Benn also

reported without explanation that across the same interval retention rates grew by 27% for Whites and by 38% for Hispanics.

Soon after Benn's (2002) study appeared, Galvez-Kiser (2005) looked at freshman-to-sophomore retention rates at Generic University. Analysis of over 1,000 White, Black, and Hispanic student records yielded no evidence that high school GPA, first-year college GPA, residence location, parents' education levels, or gender predicted students' persistence. Neither the Benn nor Galvez-Kiser study considered students' socioeconomic status as a discrete variable, though proxy variables such as parents' education suggest that socioeconomic status was also not a strong predictor of student persistence. Together, these two studies indicate that Hispanic students at this university may be retained at greater rates than others, but the reasons for retention remain unknown. An examination of the role of developmental education in the college experiences of Hispanic students may help fill these gaps. Because Hispanic men are generally more at risk than women, understanding this critical population may be the most important piece of all.

According to the state higher education authority, the university enrolled 2,832 first-time-in-college students in the fall of 2004, a representative year. The great majority—2,524—met all state standards for college preparedness (Texas Higher Education Coordinating Board and Texas Education Association, 2009). Of the 308 who fell below the state standards for placement in developmental courses, 100 placed into developmental reading. Subsequently, 86 of these developmental reading students attempted a reading-intensive college level course and, of this group, 87.2% passed the reading intensive class with a grade of "C" or better. For comparison, among students who had met state standards in all three areas—math, reading and writing—only 75.3%

attempted a reading-intensive course their first year and 89.6% passed with a “C” or better. It is possible that students placed in developmental math or writing possess lower skills across the board academically, but when their reading performance is examined, they too passed reading-intensive college classes at an 85.9% rate.

The data indicate that students placed and enrolled in developmental reading later passed their first college level reading-intensive course about as often as the majority who required no developmental work at all and as often as other students who had tested into developmental classes just for math or writing (Texas Higher Education Coordinating Board, 2008). In fact, the reading-intensive course pass rates for all three groups were within a range of 3.7%. These are notable outcomes because they also account for students who were placed in developmental reading but did not enroll as well as their results in developmental reading and regular classes afterward. Students placed in developmental education actually appear to be more aggressively pursuing reading-intensive for-credit classes than students who pass their placement tests. These figures suggest that the university may be effectively meeting the needs of developmental students. What the extant data do not show is whether this success is due to the developmental reading program itself or to other factors, and whether it extends to Hispanic males.

Problem Statement

Most high school students say they want to someday earn a bachelor’s degree, yet fewer than half achieve the goal. Among the least likely to earn a bachelor’s degree are Hispanic males, a fact that carries negative consequences for the individual, his family, and the larger society. To close the gap between the declared goals and actual outcomes of Hispanic males in college, educators need reliable information about the effectiveness

of the strategies at their disposal. Little has been written about strategies in developmental education that may be effective for the Hispanic male student, and nothing in the literature specifically addresses the effectiveness of developmental reading instruction for this population.

This study focuses on one developmental reading course and its effectiveness in improving the success of Hispanic male students in college. It seeks to answer the following questions:

Relative to their peers in reading ability, do Hispanic males assigned to developmental reading . . .

- 1) enroll in the course?
- 2) successfully complete the course?
- 3) successfully continue their studies after completing the course?
- 4) successfully complete college-level reading-intensive courses?
- 5) successfully graduate?
- 6) have similar results to the previous 4 questions once demographic traits and developmental education experiences are accounted for?

Definition of Terms

Black – refers to individuals defined in the US census as Black-non-Hispanic.

Familism – the strong family orientation of values and emotional commitments in Hispanic culture (Hernandez & Lopez, 2004).

Hispanic – refers to individuals who share a language and / or cultural origins primarily from Mexico and the Spanish-speaking areas of the Caribbean and Central and South America or individuals who self-identify as Hispanic.

Persistence – a student’s continuation in a regular program of study, whether at

one school or at different schools, with or without interruptions in enrollment.

Retention – keeping a student enrolled during a regular program of study.

Traditional student – a student between the ages of 18-24 who attends a four-year, bachelor's degree-granting institution, who lives on campus for at least the first year, and is enrolled in classes full-time.

Two-year college – refers to what is typically an Associate of Arts degree-granting institution, also often called a community or junior college.

White – refers to individuals defined in the U.S. census as White-non Hispanic.

CHAPTER II

Literature Review

According to Tinto (1982) and others (Lotkowski, Robbins, & Noeth, 2004), the rate at which students leave college without a degree has been a constant in American colleges for more than a century. Despite profound changes in the types of students enrolling, the academic programs they attempt, and the support services available to them, approximately 45% of freshmen have consistently failed to finish within the usual 4-year time frame. At traditional 4-year colleges the drop-out rate has declined to 34% (Adelman, 2006), but community colleges, receiving over 40% of all college students enrolled, suffer drop-out rates above 60% (Bailey & Alphonso, 2005) and push the overall figure for dropouts back toward its historical norm.

On its face, the longevity of the high dropout rate signals the failure of post-secondary institutions to improve their instruction and services. A more positive reading, however, argues that colleges and universities have done well. The drop-out rate has held constant (Burley, 2002) while an ever-larger proportion of high school graduates, including more women, racial and ethnic minorities, and lower income students have pursued post-secondary training (KewalRamani, Gilbertson, Fox, & Provasnik, 2007; Snyder, Dillow, & Hoffman, 2008). Though the reasons for the steady dropout rate are not clear-cut, the optimistic interpretation has merit. What is more, the high dropout rate doesn't account for the substantial and growing population of non-traditional students

who complete their degrees but take longer. In the end, approximately 60% of high school graduates acquire some form of post-secondary certification or degree, though fewer than half actually get the bachelor's degree that most had aimed for (Adelman, Daniel, & Berkovits, 2003). To improve graduation rates, colleges have long resorted to some type of developmental education.

Post-Secondary Developmental Education

Developmental education is a process that employs tutoring, personal and career counseling, academic advising, and coursework to promote every student's intellectual, social, and emotional growth and development (National Association for Developmental Education, 2009). In practice, however, developmental education often means simply that students who arrive at a school are tested for their abilities in the skills (usually mathematics, reading, and writing) the institution deems essential to success in regular class work. Those who fall below standard are given additional instruction to impart the knowledge and skills necessary for meeting the standard and succeeding in their regular classes (Parsad & Lewis, 2003). Once tested for placement, students below the standard may be either required or merely encouraged to take the additional instruction. Some states mandate that beginning college students meet a minimum standard before pursuing their degree, but more often states permit individual schools to set their own standards for determining who takes developmental classes and who does not (Jenkins & Boswell, 2002). In any case, the standards are seldom demanding. Many of the placement screening tests require no more than an eighth-grade level of performance to pass (Calcagno, 2007). Nevertheless, 30-40% of all freshmen entering post-secondary education take at least one developmental education course (Adelman, 2004; Parsad & Lewis, 2003).

According to McCabe (2000), schools seldom award credits toward graduation for developmental courses, though they frequently count them for institutional credits that qualify a student for loans, full-time status, or other benefits. As for the length of time students spend in these courses, about half of 2-year colleges and a third of 4-year colleges report that their average developmental student takes developmental work for two semesters or longer. In schools where credits are awarded for developmental work, a typical student accumulates seven semester credits for developmental classes. Policies also vary from school to school regarding whether these students can earn credits in subjects not requiring the developmental skill as a prerequisite, such as taking English or history in tandem with developmental math (Parsad & Lewis, 2003; Phipps, 1998).

The evolution of developmental education has closely paralleled efforts to improve retention and persistence, tracking a similar course from concerns with student deficits to examining institutional traits (Stahl & King, 2009). Differences between college-ready and underprepared students include positive self-perception and attitudes, broad experience, realistic expectations, high goals, strong academic values (Grimes & David, 1999; Lotkowski et al., 2004; McGaha & Fitzpatrick, 2005), and social capital (Schmid, 2001; Wells, 2008). Differences arise also in activities that initially appear unrelated to academics. Attending religious services, discussing politics, and volunteering seem more common among successful students, while the less successful students are inclined to watch TV (Grimes & David, 1999).

More often, investigators probe the institutional and environmental factors that correlate with developmental success. Adelman's (2006) study of NELS:88 data argues, in fact, that virtually all of the differences between Hispanic or African-American minority students and the White student benchmark can be explained by factors that

accompany the student to college, since socio-economic status and the rigor of the student's high school studies closely parallel the chances of the student completing a program of college study.

The Promise of Developmental Education

While developmental education aims to help students overcome their deficits no matter the source, the utility of developmental education is strongly debated. Advocates insist that their efforts are both effective and critical to the future success of American education and society (Astin, 1998; McCabe, 2003; McClenny, 2004). Given developmental education's long history and pervasiveness, its efficacy should be abundantly supported in the research literature, but the research is strikingly undecided.

Many studies (e.g., Bloom & Somo, 2005; Fleischauer, 1996; Goldstein & Perin, 2008; Leake & Lesik, 2007; Lesik, 2007; Moss & Yeaton, 2006; Waycaster, 2001) have shown benefits from developmental education. A representative instance by Lavin, Alba, and Silberstein (1981) found gains for City University of New York (CUNY) students. Entering students at CUNY were required to take tests measuring their readiness for college, but the students had the option of enrolling in the recommended developmental classes or not. The authors compared those who enrolled in the recommended classes to peers with similar test scores who chose not to enroll for the developmental work. Controlling for several possible confounding factors, the results showed that both 2-year and 4-year students who successfully finished their developmental courses were more likely to persist in school and to graduate than peers who did not enroll in developmental classes. These encouraging results, however, are disputed by a formidable body of work that finds fault with both the results and the research methods that produced them.

Problems in Developmental Education Research

The results of the study by Lavin, et al. (1981), as with many others purporting to show benefits in developmental programs, are less than meet the eye. Though developmental education has been the subject of study for decades (Braxton, 2000), when the Ohio Board of Regents reviewed the universe of research literature in 2001, it noted that no benchmarks exist by which the benefits of college-level developmental education may be judged, and a decade later, the Education Commission of the States observed that those benchmarks were still unsettled (Smith, 2011). Other surveys have concluded that the research in the field is characterized by poor methodology and low quality data (Boylan & Saxon, 2000; Moss & Yeaton, 2006; O'Hear & MacDonald, 1995; Saxon & Boylan, 2001).

Critics have complained that educational research is awash in shoddy data that are nonetheless uncritically swallowed as authoritative by laymen, journalists, and scholars alike (Adelman, interview in Glenn, 2006). Sound research is grounded in a culture of evidence, but the idiosyncratic standards, design, content, and methodology typical of developmental education (Collins, 2010; Grubb, 2001; Payne & Lyman, 1996; Perin, 2006; Roksa et al., 2009; Vandal, 2010), commonly taught by adjunct instructors (Bolt & Charlier, 2010) have instead produced a “culture of anecdote” (Bailey & Alphonso, 2005, p. 6). Consequently, according to Hughes and Scott-Clayton (2011), research has yet to produce evidence that placement in developmental education benefits students.

Both Bailey and Alphonso (2005) and Levin and Calcagno (2007) have observed that one of the greatest challenges researchers face in measuring program effectiveness is identifying the causal relationships between treatments and outcomes, as Gonzalez (1997) found when his subjects said the most helpful feature of their developmental

program was socializing with other Hispanic students. According to Swail, Cabrera, Lee, and Williams, (2005b), developmental reading appeared to be of no help to Whites but beneficial for Hispanics, suggesting that the benefits of the course may actually have been an artifact of its language-training function for non-native speakers of English.

Causal relationships are also difficult to isolate because simply defining the subject population is elusive. National data show significant arbitrariness in who takes developmental courses. Being African American or attending a 2-year college, for instance, makes a student 11% more likely to take developmental courses than similar White or 4-year students (Attewell et al., 2006). Schools in the same state may administer a uniform placement test yet apply different cut-scores to determine who is diverted into developmental work (Jenkins & Zeidenberg, 2007, cited in Doninger, 2009). Many programs merely recommend rather than require developmental courses, allowing students to opt in or out (e.g., Chen & Cheng, 1999; Crews & Aragon, 2004; Fleischauer, 1996; Lavin et al., 1981). As many as two thirds of the students identified as needing developmental work ignore the recommendations and enroll themselves in standard, for-credit classes (Bailey, 2009; Roksa et al., 2009). Concerns about selection bias are validated by findings that “more committed” 2-year college students are far more likely to take developmental classes than their “less committed” peers (Horn & Nevill, 2006).

Causal relationships are also obscured by selection bias in the many studies similar to Lavin et al. (1981) that compare only those developmental students who have completed a developmental course with an undifferentiated group of non-developmental students (e.g., Bahr, 2010; Crews & Aragon, 2007; Goldstein & Perin, 2008; Hodges, 1998; Ilich et al., 2004; Moss & Yeaton, 2006; Pinkerton, 2010; Waycaster, 2001).

Completers represent about a third of students who test into developmental work (Bailey, 2009; Bailey et al., 2008; Levin & Calcagno, 2007) and the drop-out rate for developmental course completers is nearly 20% lower than for other college students with similar traits (Bettinger & Long, 2004). Indeed, passing developmental reading courses has been explicitly identified as a better indicator of eventual college success than enrollment in developmental reading (Cox, Friesner, & Khayum, 2003; Pinkerton, 2010). If, as these findings suggest, successful students go on to success and failing students go on to failure, developmental education's apparent benefits may not be due to developmental classes *per se* as much as to student temperament, supportive personal environments, and other exogenous factors.

Given that developmental education has served more than a third of all post-secondary students for decades under the scrutiny of many researchers, the number of seasoned, rigorously documented, exceptionally effective programs appearing in the literature ought to be abundant. They are not. Roueche and Roueche (1999) and McCabe (2003) offer short lists of strong programs to cement arguments for wider support of developmental education, but their model programs are overwhelmingly short-lived, usually three years or less.

The skepticism prompted by such a void has stimulated searches to uncover "what works" in developmental education (Boroch et al., 2007; Boylan & Saxon, 2000; Garza & Gibbs, 1994; Roueche & Roueche, 1999; Rutschow & Schneider, 2011; Sheldon, 2002). What is most striking is that the resulting lists of good practice are mostly generic descriptors of good teaching and administration, such as a well-organized curriculum, trained faculty, and program evaluation. Few recommendations distinctively addressed developmental content or methodology. Waycaster (2001) also attributed the success of

developmental math students at 2-year colleges to the greater personal attention her subjects received—findings fully accounted for by Tinto’s (1993, 2006) student integration model for all college students.

Why developmental education’s success should hinge on generic educational practice is alluded to in Burley’s (2008) observation that developmental education practice fossilized around the 1970s, and the research itself is dominated by old themes “re-mastered, re-mixed, and re-reported” (p. 51). Lacking a vibrant base of distinctive research, practice, and theory, and served by faculty unversed in the distinctive challenges of adult developmental instruction (Maxwell, 1998; Stein, 2005) much of developmental education necessarily mirrors generic education with generic strengths and weaknesses. Problems with research quality have effectively subverted efforts to build a body of knowledge that reliably informs research and classroom-level practice for developmental education.

Problems with Premises in Developmental Education Research

Critics of developmental education also challenge the premises underlying much of the research. The initial act of placing students in developmental education is questioned because the assessment instruments themselves either fail to accurately identify who might benefit from developmental work or fail to identify what type of developmental work will benefit an underprepared student (Hughes & Scott-Clayton, 2011; Rutschow & Schneider, 2011).

Other studies demonstrate that, at the point of exit, researchers differ about what constitutes success. Some define program success as producing test scores at or above the average of other developmental programs (e. g., Garza & Gibbs, 1994; Lang, 2001), a self-referential tack that overlooks the programs’ reason for being. Other authors

compare GPAs, retention rates through benchmark semesters, gatekeeper course grades, or graduation rates of students who have been through developmental courses with peers who have not (Crews & Aragon, 2007; Parker, 2009; Perin & Charron, 2006; Ronco & Cahill, 2004). These quantitative measures are common throughout the research literature but vulnerable to sampling error and blind to the qualitative differences that appear when students select their coursework and academic majors.

Developmental students do, in fact, favor majors in fields noted for liberally distributing high grades—education, the humanities, and social sciences (Adelman, 2004). Non-developmental students, conversely, are nine times more likely to graduate with science, technology, engineering, and mathematics (STEM) degrees (Ohio Board of Regents, 2006) – subject fields represented among classes with notably low pass rates (Adelman, 2004). Defining success for developmental education without acknowledging these qualitative differences clearly requires a caveat.

Further intriguing evidence hints that reading and writing skills taught in developmental programs may carry over into content-area courses (Caverly, Nicholson, & Radcliffe, 2004; Perin & Hare, 2010), but that transfer is the exception rather than the rule (Lesley, 2004; Perin, 2008). Students enrolled concurrently in developmental and regular credit classes tend to do well or poorly in both (Bohr, 1993; Illich et al., 2004). The same studies find that those who fail in one developmental skill area, such as math are also more likely to fail in seemingly unrelated reading, arts, and physical education classes. Such reports indicate that developmental education researchers may not yet know what, precisely, is being measured, and that either the research or the programs themselves may be too narrowly conceived.

Another possibility suggested by these findings is that student attributes are, if not immutable, at least not readily enhanced by the kinds of developmental programs currently in place. Developmental reading students often arrive with a lifetime of discouraging experience labeling them under-achievers (Lesley, 2004). Hagedorn et al. (1999), concluded that developmental education benefits accrue to lower income students but not those from higher income, better educated families. While higher levels of income and parental education generally correlate with more time studying during high school, Hagedorn and his colleagues wrote that well-off students placed in developmental courses have typically spent less time studying in high school and continue their poor performance in the developmental classes. For these and many other students (Yaworski, Weber, & Ibrahim, 2000), weak academic skills may be due to personality traits and innate learning capacities more than information or skill deficiencies rectifiable in developmental education. Personal and career counseling, under these circumstances, may be more beneficial than developmental courses.

Deil-Amen and Rosenbaum (2002) have also challenged developmental education's premises. They described the "cooling out" effects of developmental programs, whereby students faced with the obstacles of college bureaucracy, costs, and placement testing are further demoralized by diversion into developmental classes and the stigma associated with them. Yet, when schools deliberately minimize the stigma of developmental education, they tacitly withhold the candor students need to make wise life-choices. As many as a quarter of developmental students, they asserted, are unaware that they are in non-credit classes. Such confusion may help explain why about half as many students say they have taken developmental courses as transcript records indicate (Adelman, 2004).

Equivocal Results from Large Studies.

Developmental education research has long been overly dependent on studies of small, unique samples, but in recent years significant work has come from research exploiting very large data sets. The size of the data sets and improved methodology has set studies of developmental education on much firmer footing.

Taraban (1997) compared the educational paths of over 5,000 Texas college students who had failed the state's mandated reading proficiency test once and had to take it again later. Some chose to take developmental reading before re-taking the test and others simply enrolled in standard college courses. When the students took the reading proficiency test a second time the scores for both groups improved by equal amounts, in line with findings in other settings by Bohr (1992) and Illich et al. (2004).

Adelman (2004, 2006, 2003) used data from three national grade-cohort longitudinal studies tracking students through their public school years and beyond. The studies followed cohorts who entered school in 1972, 1980, and 1992, with sample sizes of 12,600, 8,400, and 8,900, respectively. Adelman (2006) determined that the probability of a particular student earning a degree was best indicated by a combination of socio-economic status and academic "momentum." He defined momentum as the intensity of the student's high school course work and early accumulation of credits in benchmark courses (such as college level math). Students who successfully completed a developmental course also gathered momentum toward a degree, suggesting developmental work may be a positive factor for graduation. These apparent gains were again tempered by the fact that many failures were not counted because they never crossed that course-completion threshold. Once all other factors were accounted for, Adelman reached much the same conclusion as Taraban (1997), Illich et al., (2004), and

Bohr (1993): developmental courses neither benefit nor harm a student's likelihood of achieving a degree.

Similar verdicts on post-secondary developmental education emerged from state-wide studies in Ohio (Bettinger & Long, 2004), Virginia (Roksa et al., 2009) and Tennessee (Boatman & Long, 2010). Some have proposed that developmental education's greatest contribution may be its sorting function, nudging weak students to quit college outright or choose less demanding schools (Bettinger & Long, 2004). The sorting function may also be expressed in the academic majors that students choose, since, as noted earlier, developmental students tend to favor less difficult courses of study (Adelman, 2004; Bettinger & Long, 2004; Ohio Board of Regents, 2006). The studies do not indicate whether the act of placement influences the choice of major or whether the students already have a sense of their aptitudes and choose their paths independent of placement in developmental courses.

Other studies signal that the act of placement does indeed make a measurable difference. Surveying the results of several thousand students, Bentley and Gellene (2005), and Jenkins, Jaggars, and Roksa (2009) observed that developmental classes discouraged students from attempting introductory courses in chemistry and math. Hennessey (1990) tracked developmental students from the instant of referral to completion of the full developmental sequence and concluded that placement in developmental education discourages students from persisting in school. Bailey, Jeong, and Cho (2008) reached a similar finding after comparing the results of over 250,000 students to NELS:88 data. Of the students in their study who were referred for developmental work, 30-40% finished all the recommended series of courses. Nearly half of the students recommended into developmental classes quit before finishing the

first course, and of those, more chose to not even enroll than actually attempted the course and failed. Adelman (2004) substantiated these claims with evidence that 75% of “incidental” students – those who accumulate fewer than 10 credit hours before leaving school – had taken a developmental course, compared to 42% of other students. Such results that draw attention to students who do not successfully complete the developmental courses to which they have been assigned mitigate the positive claims for developmental education based on the successes of program completers. They also caution researchers to account for the effects of placement on students’ academic experiences.

Calcagno and Long (2008) and Boatman and Long (2010) adopted a regression discontinuity methodology to test results across state college and university systems in Florida and Tennessee, respectively. The regression discontinuity design attempts to overcome non-randomized sample bias by looking only at students who scored just above and just below the cut-off point for developmental education, then making statistical adjustments to create a quasi-experimental design using matched control and test groups.

Florida’s developmental students, according to Calcagno and Long (2008) persisted in school longer, but once the students entered regular, college-level credit classes they quit at the same rate as others who had not been through developmental courses. Students who finished developmental math earned more total credits but no more college-level credits than their peers who did not take developmental math, and were no more likely to earn a degree. Developmental reading showed neither positive nor negative effects. Due to Florida law, developmental education occurs almost exclusively in the 2-year college setting, leaving open the possibility that the developmental reading results do not apply to 4-year schools.

Boatman and Long (2010), however, included both 4-year and 2-year colleges in a regression discontinuity study of Tennessee's post-secondary students taking developmental mathematics, writing, and reading. Their findings suggested that the impact of developmental education was small, though harmful to those better-prepared students closest to the placement cut-off scores. Yet, they also found that developmental courses provided some advantages to students who arrived at college less well prepared in writing, indicating the need for more nuanced investigations of which students benefit and why.

Martorell and McFarlin (2007) applied regression continuity methods to a study of 450,000 students in Texas' public colleges and universities. They examined not only academic records but measures of earnings up to 7 years after students entered the work force, allowing outcome assessments beyond the usual criteria of school performance. Despite the broader scope of their study, the findings essentially affirmed those from Florida and Tennessee. Developmental work produced marginal (5%) gains in future mathematics course grades but none in reading. Developmental education did not significantly increase the number of academic credits students attempted, their persistence in college, their time to graduation or their chances of receiving a degree. Seven years after entering school, non-developmental 4-year college students earned \$5,800 more than their counterparts from developmental courses. Given the aforementioned propensity of developmental students to avoid STEM courses, this earnings effect may well be due to the different majors developmental and non-developmental students choose.

Miller (2007) extended and elaborated on the study by Martorell and McFarlin (2007) to eliminate possible confounding factors. Looking just at mathematics, Miller

again concluded that, in Texas, “the state’s course-based developmental education program is currently not helping, and most likely hurting students with test scores just at and slightly above the current cutoff for placement in developmental education” (p. 4). This assessment of mathematics follows numerous other measures for developmental mathematics and developmental reading outcomes in his study that moved in tandem, suggesting that, were reading to be studied separately, the results for reading would justify similar criticism.

Though Bettinger and Long (2004) at first determined that developmental education had no discernible benefit, they published a second analysis of their data (2005a) reversing those conclusions. The more recent study stated that “ability bias” distorts assessments of developmental education, meaning that more low-ability students enter developmental education and that the benefits of developmental education have to be measured while holding constant for student ability. Having made that adjustment, they maintain that developmental education improves the likelihood of a student just below the cut-off point for developmental work persisting and graduating with a bachelor’s degree. Their critique accurately identifies a flaw in research that compares developmental students with an undifferentiated pool of non-developmental students, but fails to account for studies the regression discontinuity studies discussed above that did effectively compare students of similar ability without finding benefits from developmental education.

Given their size and methodological quality, these regression discontinuity studies fairly conclusively demonstrate developmental education’s ineffectiveness at increasing the number of credit courses passed, GPAs, or graduation rates for a large swath of the students involved. Some investigators using regression discontinuity methods propose

that developmental education may benefit a stratum of “high achieving” developmental students (Bettinger & Long, 2005b) while many more (Boatman & Long, 2010; Calcagno & Long, 2008; Martorell & McFarlin, 2007; Roksa et al., 2009) find no such benefit.

Counter-factual models of causal inference provide a different statistical approach that avoids some of the selection bias possible with regression discontinuity studies. This method has the potential to isolate treatment variables from background “noise”, as Attewell et al. (2006) did with NELS:88 data to test the efficacy of college developmental education. Their counter-factual study matched pairs of statistically similar students (with for example, similar socio-economic status (SES), high school GPA, and parents’ education level) who did and did not receive treatment. The arrangement enabled investigators to compare hypothetical control and treatment groups. This strategy surmounts selection bias in a manner similar to the regression discontinuity strategy, but without the potential problems arising from excluding students far below the placement cut-off scores. In the event, their analysis determined that students taking developmental reading in 4-year schools were 11% less likely to graduate than their peers, but this finding did not hold in 2-year colleges. Developmental writing and math showed little effect in either setting. Over-all, developmental course work, as it is generally practiced nation-wide, did nothing to improve students’ chances of graduation.

In sum, research in developmental education has for too long relied excessively on short-term studies of small populations in idiosyncratic programs with poor controls for selection bias, but recent large studies have corrected many of these faults. Using different populations and methods, the larger studies nevertheless concur on a disquietingly consistent and damning verdict: developmental education does not help most students. If it does not work, then ethical questions arise about whether

developmental education programs sell students, parents, and other stakeholders a dishonest vision of possibility and progress. If so, the penalties in time, money, and opportunity costs are most heavily exacted on a vulnerable, lower-income population least able to recover. Nevertheless, the idea that skills for college success can still be effectively taught to underprepared students after they arrive on campus remains deeply embedded in current theory and practice (National Association for Developmental Education, 2009). Some evidence does offer hope that that well-designed programs may benefit specific populations. Finding the appropriate match of program to student calls for focused research to isolate and identify what works for which students.

Developmental Reading

Where investigators have examined college developmental reading, the results have, again, been mixed. Leake & Lesik (2007), using a regression-discontinuity analysis, accounted for many of the possible sampling problems in prior studies and, for their sample ($n = 167$), determined that developmental reading did improve students' first semester GPAs. Contrarily, Dimon (1993), Bohr (1993), Taraban (1997), Illich et al. (2004), Bailey (2008), Roksa et al. (2009), Perin and Hare (2010), and Rutschow et al. (2011) all found that students made similar progress in reading whether they had developmental reading instruction or not. Bohr (1993) even found that reading improved as much for students who took foreign language or music classes as for those who took developmental reading. Additional large, methodologically sophisticated studies by Martorell and McFarlin (2007) and Calcagno and Long (2008) found developmental reading courses to have either neutral or marginally negative effects on degree completion. Attewell, Lavin, Domina, and Levey (2006) observed that developmental reading outcomes differed between 2- and 4-year schools, actually reducing graduation

rates by 11% at the 4-year colleges but improving graduation rates by a similar amount at 2-year institutions. This difference from the findings by Calcagno and Long (2008), who also looked at 2-year schools, may be artifacts of differences in their methodologies and the populations they studied. Whereas Calcagno and Long's discontinuity regression analysis compared students near a cut-off point on the basis of test scores, the counterfactual approach allowed Attewell et al. (2006) to compare students across a wider range of test scores and traits, producing a more sensitive measure of course outcomes. The weight of evidence further suggests that developmental education may indeed benefit students in the middle-to-low ranges of placement test scores.

Reviewing the literature on developmental reading programs, Maxwell (1998) characterized her undertaking as an "exploration of failure." Programs failed, she said, because: (a) instructors were rarely trained in adult reading, (b) placement and exit tests seldom measured the reading skills used in mainstream courses, and (c) curricula stressed "basic skills" and literature instead of mainstream course content. Cumulatively, she hypothesized, these deficiencies could explain why Dimon (1992) found developmental reading students actually reporting lower reading gains than peers in reading-intensive general education courses. At the classroom level, Torgerson et al. (2004) sifted 4,500 papers on adult reading interventions to glean 34 of sufficient research rigor to merit confidence. Of the 34, 18 recorded inconclusive results, 11 reported no or negative effects, and 5 reported that the intervention yielded a positive effect.

Upon examining developmental education outcomes at CUNY, Chen and Cheng (1999) found the average post-test reading score improved 9.7% compared to 39.2% in writing and 28.6% in math. The study did not account for selection bias and cannot speak to the benefits of developmental education in general, yet the relative gains

between different subject areas is instructive, suggesting again that reading deficits betoken distinctive learning problems.

According to Adelman (1998, 2004), assignment to developmental reading is the greatest indicator of academic trouble for an incoming student. Two-thirds of students slated for developmental reading are enrolled in at least two other developmental courses, and 30% of students taking developmental reading earn any kind of credential at all, ever. Adelman (1998) concluded that, “when reading is at the core of the problem, the odds of success in college environments are so low that other approaches are called for”—one point on which he and McCabe (2000) agree. Possible alternatives, the differences in the developmental student population, and the developmental reading population in particular, deserve closer scrutiny.

Alternatives and Population Differences

Several sources describe what this closer scrutiny of alternatives might entail. Caverly (1997) recommended teaching metacognitive reading and study strategies that integrate journal writing, authentic texts and, ideally, materials from mainstream courses. This approach anticipates many of the elements identified in later studies which assert that successful reading programs integrate developmental skill instruction with reading-intensive mainstream courses (Bailey et al., 2008; Boylan & Saxon, 2000; Caverly et al., 2004; Maxwell, 1998; Perin, 2008; Rey & Karstadt, 2006; Roueche & Roueche, 1999). This integrated method aims to engage students in meaningful, motivating work that addresses a spectrum of academic needs not met in skill-focused courses.

Another feature of successful programs is hinted at by the relative success of students who eschew developmental reading courses for regular program courses (Bohr, 1993; Dimon, 1993; Illich, et al., 2004; Maxwell, 1998; Taraban, 1997). Students in

regular courses are often tasked with extensive reading, which by itself stimulates reading comprehension, vocabulary development, spelling, and writing skills, while many developmental reading programs confine students to paragraph-level reading, workbook comprehension exercises, word analysis and isolated study skills (Paulson, 2004). Developmental programs that incorporate extensive reading, therefore, may hold promise.

Some studies of supplemental instruction (Eckard & Hegeman, 2002; Hodges, Dochen, & Joy, 2001) conclude that reading performance and educational outcomes improve substantially when supplemental instruction is used alongside for-credit courses. This also supports the proposition that developmental reading instruction can be successful if conducted appropriately.

The evidence to date indicates that students slated for developmental reading are more likely than other students to do poorly in college and leave school without completing their program of studies. The courses designed to teach the reading skills they lack often appear to have little or no effect on either their reading skills or their academic performance afterwards. However, Caverly (1997), Maxwell (1998), Paulson (2004), Caverly, Paulson, and Reardon (2012), and others suggest that well-designed, well-staffed programs that are integrated into mainstream courses may be beneficial. Evidence from a methodologically sound, long-term study to support such a hypothesis is needed. Based upon this review, this study will examine the takers (previously identified as those students who completed a state-mandated placement test and enrolled in a developmental reading course) and compare them to the skippers (previously identified as those who were identified as needing the developmental reading course but did not

enroll in it), and the passers (previously identified as those who passed the placement test and did not need to take developmental reading).

Gender differences.

Much evidence indicates that any well-designed educational program, including developmental education, must account for students' gender differences. Maleness is, in fact, one of the demographic factors most strongly correlated with college failure (Miller, 2007). Women both abroad and in the United States heavily out-number men in post-secondary school enrollments (Higher Education Policy Institute, 2009; Snyder, et al., 2008; Vincent-Lancrin, 2008). In the US, men make up less than 44% of undergraduates and earn 40% of 2-year and 43% of 4-year degrees awarded (Peter & Horn, 2005). The disparity is greater among Hispanics, where in 2004-2005 Hispanic men accounted for 31% of Hispanic enrollments (Cook & Cordova, 2007) in an on-going trend that has prompted talk of the "vanishing" Hispanic male (Jaschik, 2010; Saenz & Ponjuan, 2008).

Men and women also differ in their major areas of study. Men dominate engineering, computer science, and the physical sciences, while women take degrees in education, health care, and psychology far more than men (Peter & Horn, 2005). Given these differences, it is not surprising that men and women respond differently to the college environment. Men are generally less sociable, adjust less readily to college life than women (Noble, Flynn, Lee, & Hilton, 2007), and arrive in college with measurably less interest than women in graduating on time (Anastasia, Tremblay, Makela, & Drennen, 1999). Men assume a more distant and isolated stance, are less interested in and less willing than females to seek counseling and help, less willing to take advantage of the more academically helpful services such as assistance from professors outside of class time, psychological or career counseling, developmental opportunities, or other

assistance that encroaches on their autonomy or seems to place them in subordinate positions (Addis & Mahalik, 2003; Anastasia et al., 1999; Pederson & Vogel, 2003; Ramirez, 2005). Men do, however, use campus recreational facilities and game rooms more than women (Junn et al., 1996). In developmental learning men are, again, less receptive to getting help, and invest less of themselves in their academic endeavors. Though less likely than women to be assigned to developmental courses, men are also less likely than women to finish (Bettinger & Long, 2005; Topper, 2008).

Minority males exhibit different traits from minority females, too. Hispanic males accumulate fewer credits toward graduation by the end of their third year of college than Hispanic women or White, Black, Asian, or Native American students of either gender (Clery, 2008). Hispanic males are less disposed to use professional counseling services than Hispanic females (Ramos-Sanchez & Atkinson, 2009). Hispanic male success is more influenced by the presence of other Hispanic males on campus. Hispanic female success is influenced by the presence of other Hispanic women (Cerna et al., 2009). Black male students are far less likely than Black women to take detailed lecture notes (Cuyjet, 1997) and are notably absent from college social activities or networks of mutual help and support (Turner, 2000). Black males are frequently less inclined than their White counterparts to engage in college social and classroom activities (Cuyjet, 2006; Spradley, 2001). In each case the differences weigh against the males described because students who use college services and connect with the campus community are more likely to overcome poor high school achievement records (Smith, 2004-2005). These more socially and emotionally engaged students also earn grades and stay in school at rates comparable to classmates entering college with much stronger high school backgrounds.

Ethnic and Racial Differences.

Differences do not, of course, appear only between men and women. Race, ethnicity, and culture also correlate with significant differences in college student behaviors and academic outcomes. While Hispanic high school graduates who are U.S. citizens enroll in college at rates similar to Whites in the same 18-24 year old bracket (Llagas, 2003), by some metrics, Hispanics who graduate from high school are more likely to go to college than their White peers (Fry, 2002). From 1994 to 2004, Hispanic enrollment out-paced all racial/ethnic groups, increasing by 67% (Cook & Cordova, 2007). Six years after entering college Hispanics are as likely to have earned their degrees as Blacks (Seidman, 2005). For Hispanic students, a bachelor's degree increases future earnings more than the same degree for Whites (Kim, 2003) and provides just as great a likelihood of advancing to graduate school (Strage, 2000). Collectively, these indicators paint a picture of glowing Hispanic success. Yet, as one might expect for such a large and diverse group of people, the complete picture mixes elements of bright hope and troubling under-performance.

One of the starkest indicators of under-performance is that 22% of Hispanics quit high school before graduating, double the dropout rate of Black students and more than three times the rate of Whites (Planty et al., 2008). High dropout rates make the pool of possible future college applicants smaller. The remainder who complete high school take fewer advanced placement courses, score lower on college admissions tests, and generally leave secondary school less college-ready than other students (Llagas, 2003).

When Hispanic students go to college, 40% opt for 2-year rather than 4-year schools, a choice shared by 25% of Black and White students (Fry, 2002). Even highly qualified Hispanic students apply to 4-year colleges in lower proportions than do their

Black and White peers (Adelman, 2006). Hispanic students are more likely than others to delay entry into college after finishing high school, to attend part time, and to have discontinuous enrollments (Swail et al., 2005b). In college, Hispanics and Blacks are half again as likely to be directed into developmental programs as Whites or Asians (Adelman, 2004; Miller, 2007) but less likely to finish the courses (Bettinger & Long, 2005b). In the end, 11.3% of Hispanics between the ages of 25 and 29—and 8.3% of Hispanics of Mexican origin—have bachelor's degrees, versus 60% of Asians, a third of Whites, and 17% of Blacks (KewalRamani, Gilbertson, Fox, & Provasnik, 2007). Likewise, despite their disproportionate representation among 2-year college enrollments, Hispanics earn fewer associate's degrees (6.5%) than Blacks (6.9%) or Whites (9.4%) (U.S. Census Bureau, 2007). Factors besides gender and ethnicity bear on graduation rates for Hispanic students, however.

Other factors.

In addition to gender and ethnicity, higher levels of parental education increase a student's odds of completing a degree (Strayhorn, 2006), but fewer Hispanic parents have college experience compared to parents in other racial/ethnic groups. Among Hispanics, 34.5% of adults age 25 and older have studied beyond a high school diploma, compared to 49.7% of Blacks, 61.5% of Whites, and 67% of Asians (calculated from data from U. S. Census Bureau, 2011). Though a substantial part of this statistical disparity may be due to recent high levels of adult immigration, Hispanic students will, nonetheless, likely enjoy fewer family role models and less family support for post-secondary education than others. This variable will be examined in this study.

Low economic status is also closely linked to low post-secondary results. In 2007, fully half of Hispanics in the traditional 16-24 year old college-attending age

bracket fell below 200% of the poverty level, and for those who were neither enrolled in school nor holding a high school diploma, that proportion rose to 69% (U.S. Census Bureau, 2007). By way of comparison, per capita income in 2006 was \$15,421 for Hispanics, \$17,902 for Blacks, \$30,431 for Whites, and \$30,474 for Asians (DeNavas-Walt, Proctor, & Smith, 2008). Nationally, 16% of all students in the bottom income quintile earn a bachelor's degree or beyond, compared to 72% of students from families in the top income quintile (Adelman et al., 2003).

Low family incomes are sometimes indirectly associated with impediments to academic progress such as the necessity for older children rather than paid care givers to provide child care or a lack of information about how to enroll in and pay for college (Gandara, 2005). For undocumented Hispanic students, transportation and health care can also be obstacles. Income, then, is a powerful factor in understanding Hispanic college results and will be included in this study.

Closely affiliated with low economic status are different forms of institutional failure. Low SES minority students often encounter under-funded schools staffed by inferior teachers offering limited course and extra-curricular opportunities—disadvantages that accompany low SES students through their primary and secondary school years (Brown, 2008; Desmond & Turley, 2009; Gandara & Contreras, 2009; North, 2009; Sperling, 2007).

Compounding economic disadvantages are social factors such as racism, cultural insensitivity, curriculum bias, and lack of ethnic representation among school personnel (Valencia, 2011). Mexican immigrant middle and high school children often encounter teaching methods and social environments that subvert academic success (Gilbert, 2005; Valdes, 2001). In fact, Valenzuela's (1999) ethnography of a Houston high school

describes the education of Hispanics there as subtractive—stripping away social and cultural resources that could otherwise promote academic success. Since this study is about students who have enrolled in college, the population examined will, in some sense, be survivors of these environmental obstacles, but the data available do not describe these factors and will not permit their influence to be measured.

The literature on Hispanic college experiences also frequently stresses the role of culture. Strong cultural identity promotes higher levels of academic achievement for Hispanic students (Tossi, 2006), and familism—the priority given family in Hispanic culture—governs many students’ decisions about whether to go to school, where to go, their level of commitment to academic studies, and when to leave school (Gandara, 2005; Van Hell, 2007). Familism can be an exceptionally strong source of support since Hispanic parents are virtually unanimous—by a 95-5 margin in one study—in saying college education for their children is very important. Some parents assert that better educational opportunities figured in their desire to immigrate to the US (Sciarra & Whitson, 2007).

Familism, however, also harbors values that compete with college goals. Because going to college is often synonymous with leaving home, far fewer Hispanic high school graduates apply to college than do Black, White or Asian graduates (Hardway & Fuligni, 2006; Pew Hispanic Center, 2004). Since familism entails an obligation to support the family, college for males is often regarded not as preparation for, but a diversion from, assuming adult responsibilities and contributing to the family financially (Baker, 2008; Lopez, 2009). For Hispanic females, familism may include the expectation that holding a relationally stressed family together takes priority over college (Pidcock, Fischer, & Munsch, 2001). Once measures of familism are factored in, the gap in the proportion of

White and Hispanic high school graduates applying to college narrows dramatically, and among those applying to selective colleges the gap all but disappears (Desmond & Turley, 2009). Familism represents an area of Hispanic student life that is known to influence college outcomes, but is inaccessible through the data available to this study and will not be included among the variables examined.

Since about 40% of Hispanics in the US are foreign-born (Gibson & Jung, 2006), the effects of a student's place of nativity and pre-college education are relevant. Of international students in CUNY's 2-year degree program, foreign-born students are more likely to graduate than the American-born (Bailey & Weininger, 2002). Within ethnic groups, foreign-born students who had graduated from a foreign high school were more likely to complete the associate's degree, but immigrants who had graduated from U.S. high schools had the better chance of transferring to 4-year programs. Having been born abroad, apparently, corresponds with values, attitudes, and behaviors that foster college success, but immigrant graduates of American high schools had perhaps been in the US long enough for their families to gather the resources and financial aid knowledge to pay for education beyond the 2-year degree.

Immigrant students routinely struggle to comprehend and express themselves in English, a problem that animates both advocates and opponents of bilingual education (e.g., Boulet, 1999; National Latino Children's Institute, 2011). For 72% of Hispanics in the 9th-12th grades, the primary language spoken at home is Spanish, and almost 17% report speaking English with difficulty—more than any other racial or ethnic group (KewalRamani et al., 2007). However, students who speak Spanish at home have a 70% greater chance of getting a baccalaureate degree than Hispanic-heritage students whose language at home is English (Sciarra & Whitson, 2007). First generation Hispanic

immigrant children also outperform second and third generation Hispanic students despite their greater difficulties with English (North, 2009). This fact may be accounted for if language is also a proxy for other traits shown to influence academic success, such as affinity for one's culture of origin and involvement in the ethnic community (Bankston III & Min, 1995; Tossi, 2006).

The diversity among these foreign-born students includes diversity in their educational experiences. The importance of differentiating among Hispanic immigrants is reaffirmed in Leinbach and Bailey's (2006) CUNY study which observed that Mexican immigrants constituted 21% of New York City's foreign-born population but 3.5% of the foreign-born students. Central and South American immigrants, on the other hand, accounted for 24.1% of the city's foreign-born residents yet represented 41% of foreign-born students. These numbers reflect national data in which Cuban Americans and students with South American backgrounds acquire bachelor's degrees at rates comparable to native-born, non-Hispanic Whites (Lowell & Suro, 2002), and justify attention to the many sub-groups.

Ethnic differences appear in a variety of other measures related to retention and developmental education. The differences in the ways races and ethnic groups respond to instructors (Brown, 2008) and use campus student services can be subtle, too: financial aid has a more positive influence on Hispanics than Whites (Cabrera et al., 1992; Nora, 1990), and minority students are less likely than Whites to seek support from mental health services (Ramirez, 2005).

Some who have written about ethnic differences have criticized Tinto's (1982, 1992, 1993, 2006) student integration model as inappropriate for minority students (Perrakis, 2003; Tierney, 1999). Nevertheless, much of the model seems to remain

relevant for minorities. The fact that minority males, in particular, often avoid the type of extracurricular activities identified as critical to persistence (Fischer, 2007; Spradley, 2001; Turner, 2000) becomes a legitimate concern when evidence shows that Black and Hispanic students with higher numbers of formal social and academic ties on campus tend to perform better academically (Benn, 2002; Maestas, Vaquera, & Zehr, 2007).

Research into gender, racial, ethnic, and cultural differences has the potential to identify needs, strategies, and opportunities peculiar to particular student groups. The potential of the research is dependent on accurately understanding the populations being studied and the instructional methods used. Unfortunately, much of the research involving minorities in developmental education over-reaches, making generalizations that cannot stand because the diversity of racial and ethnic minority populations is not well appreciated.

Problems with the Study of Racial and Ethnic Minorities

Studies assessing the merits of developmental education for racial and ethnic minorities seldom notice that the labels ascribed to racial and ethnic groups are problematic in ways that subvert the quality and utility of research. While discussions about groups are always vulnerable to stereotyping and over-simplification, the hazard multiplies when the objects of conversation are racial and ethnic groups. The terms Hispanic and Asian, most notably, reference extraordinarily diverse populations. “Asian” denotes a taxonomic convenience more than any meaningful commonality of race, social history, or experience among, for example, the fifth-generation Japanese-American and first generation Indian immigrant (Srinivasan, 2001). Racially, Hispanics include Whites, Blacks, Asians, indigenous peoples, and endless blends of these categories. United mostly by speaking Spanish, Hispanics nevertheless speak many dialects of the language,

and growing numbers in the US speak only English (Ramirez, 2005). In the US context, a high proportion of Hispanics and Asians are immigrants and first generation children of immigrants, yet many are native-born residents who, in the case of Hispanics, may boast community and family roots antedating the United States itself (Pachon & Moore, 1981).

Taxonomic problems aside, nation of origin, immigration and settlement experiences, and duration of residence are widely recognized to influence educational outcomes (Conchas, 2001; Leinbach & Bailey, 2006; Lowell & Suro, 2002; Massey et al., 2007; Ogbu & Simons, 1998; Strayhorn, 2006; Thomas & Quinn, 2007). Among high school students, Hispanics born abroad drop out at triple the rate of their U.S.-born Hispanic peers, accounting for 28% of all the 16-24 year old drop-outs in the United States (Planty et al., 2008). The import of those numbers becomes clear in light of the fact that 40% of Hispanics nationally are foreign-born (Gibson & Jung, 2006). In fact, Lopez (2009) concluded that the most significant education gap for Hispanics is not the gap between Hispanics and Whites, but between native-born and immigrant Hispanics. In the state of Texas, the foreign-born population from Mexico represents a tenth of all residents, more than a quarter of all Hispanics, and fully 45% of Hispanic adults eighteen years of age or older (Lopez, 2009; Ramirez, 2004). Any statements about Hispanics, therefore, must allow for the diversity cloaked in that designation.

As in prior discussions of Hispanic academic achievement in the US, variations within the ethnic category have to be acknowledged. Although Cuban and South American students are as likely to graduate from college as non-Hispanic White students, students from Mexico tend to do less well, yet finish their degrees more often than students from Puerto Rico and Central America (Cerna et al., 2009; Fry, 2002; Greene, Marti, & McKlenny, 2008). That difference may be attributable to a population's greater

likelihood of coming from the middle and upper classes, with better-educated parents and access to other resources associated with success in school (Fry; Greene et al.). Puerto Rican students in Florida, however, are more English-proficient and better educated than Puerto Rican immigrants elsewhere in the US, representing the variations that appear even within sub-groups (Greene et al.). Hispanic educational experiences also vary from state to state, as in California, where the lowest 2-year college tuition in the nation (Sengupta & Jepsen, 2006) attracts 80% of first-year Hispanic college students, versus 54% nationally (Fry).

Kreysa (2006-2007) censures developmental education investigators for pooling the data of disparate minority populations in ways that obscure important trends. But, Kreysa's own study of minority academic achievement exemplifies the problem. Asians represent more than half the minority students in Kreysa's sample, yet constitute less than 13% of the non-White population (Ramirez, 2004) and are consistently over-represented in the highest stratum of academic achievement (Adelman, 2004; Hudson, 2003; Seidman, 2005). Since Blacks and Hispanics who are two-thirds of the non-White population in the US populate the bottom of academic rankings, Kreysa's generalizations about minorities mean little beyond his particular study. More attentive studies of sub-populations may clarify or remove some of the contradictions in developmental education research and yield a richer understanding of how developmental courses influence outcomes for particular student populations in specific circumstances.

Hispanic males occupy a disproportionate space at the intersection of ethnicity, gender, and developmental education generally, and developmental reading most particularly. Hispanic males are among the least likely students to go to college, most likely to be directed into developmental education, and least likely to graduate. In

developmental courses of all kinds, Hispanic males under-perform compared to Hispanic females. In fact, Miller (2007) found that being Hispanic and male were stronger indicators of leaving college than was family income. The literature has paid scant attention to Hispanic males in higher education, has less to say about them in developmental education, and is virtually silent on their experiences in developmental reading.

Studies of Developmental Reading in Texas

Texas is the locus of this study. Developmental reading in Texas has received some attention in the research literature, as has been noted occasionally throughout this review. In short, Garza & Gibbs (1994) analyzed the eight best two-year college developmental reading programs for minority students in Texas and found relatively unexceptional similarities (the presence of administrative support, financial aid, class sizes of 20 or less, written program goals, etc.). The most informative finding was that about half of the programs used a whole-language approach to reading instruction, though by the same token, about half did not. Taraban (1997), Martorell & McFarlin (2007), and Miller (2007) each examined state-wide databases of developmental reading students undifferentiated by ethnicity or gender. All concluded that developmental reading did not improve a student's academic performance and Miller found the effect to be slightly negative. Lang's (2001) brief survey of high- and low-performing 2-year college programs in Texas identified similarities and differences, but was unable to establish whether the variables enabled developmental students to perform better over time. Thus, the studies in Texas to date suggest that, if developmental reading has a benefit for underprepared students, the appropriate match between methods and beneficiaries has yet to be identified.

Key Variables

The literature surveyed so far has identified a series of variables pertinent to investigations of developmental reading. Numerous studies (e. g., Bailey et al., 2008; Calcagno & Long, 2008; Perin & Charron, 2006) identify passing a placement test, placement and enrollment in developmental reading, and placement but avoiding enrollment in developmental reading as significant moderating variables when examining the efficacy of developmental reading programs. Other variables that previous research has used to measure developmental reading outcomes include completion of a developmental reading course, second semester enrollment (Adelman et al., 2003), grade earned in a gatekeeper college-level for-credit course (Bahr, 2010), second year enrollment (Adelman et al., 2003), and graduation (Martorell & McFarlin, 2007).

Reasons for Hope

This review of the literature has found that post-secondary developmental education has long been used to help underprepared students succeed in college, but that the promise of developmental education has not been well supported by methodologically rigorous research. Despite the shortcomings of the “culture of anecdote” characteristic of studies affirming developmental education (Bailey & Alphonso, 2005, p. 6), such incidental evidence ought not be precipitately dismissed. If, as the more careful studies report, developmental education on average does little harm or good, it is entirely possible that the field encompasses a range of program quality—some harmful, some advantageous—or that some groups of students may benefit from developmental education more than others. Swail et al. (2005b), do, in fact, suggest that Hispanics may benefit differently from Whites, and others (Garza & Gibbs, 1994; Lang, 2001) find that

some minority-serving developmental reading programs have more successful students than others.

Whether these programs succeed because their students arrive better prepared, are better integrated into school life, share more supportive cultural and economic backgrounds, or because the programs themselves are distinctively better suited to their learning needs remains undetermined. Careful studies of developmental reading programs with long histories offer an opportunity to identify programs and practices that do successfully foster academic success and fulfill the promise developmental education makes to students and stakeholders. Well-designed, well-staffed programs integrated into mainstream courses may benefit developmental reading students (Caverly, 1997; Garza & Gibbs, 1994; Maxwell, 1998; Paulson, 2004; Rutschow & Schneider, 2011), but evidence to support such a hypothesis is also needed from a methodologically sound, long-term study. This study, therefore, examined the effects of a single developmental reading course on academic outcomes for Hispanic males over a ten-year period.

Research Questions

The specific research questions answered in this study were:

How well do moderating variables (placement and enrollment in developmental reading, placement but no enrollment in developmental reading, not placed in developmental reading) (Bailey et al., 2008; Cerna et al., 2009) predict the success of Hispanic males in a 4-year college as measured by:

- 1) Gatekeeper grade (Bahr, 2010)
- 2) Enrollment in the second semester (Perin & Charron, 2006)
- 3) Second semester GPA
- 4) Enrollment in the second year (Adelman, 2004)

- 5) Second year ending GPA (Ronco & Cahill, 2004)
- 6) Accumulated credits at end of enrollment at the university (Adelman, 2004)
- 7) Graduation (Martorell & McFarlin, 2007)

Variables in the study.

Many variables have been found in the literature to influence student outcomes, but a few stand apart as especially pertinent to this population and the purposes of this study. These are identified in Table 1.

Table 1

Variables and types

Variable	Type	
Ethnicity (Llagas, 2003)	Exogenous	Nominal
Gender (Saenz & Ponjuan, 2008)	Exogenous	Nominal
Socioeconomic status (Adelman et al., 2003)	Exogenous	Interval
SAT score (Adelman, 2006)	Exogenous	Interval
High school GPA (Cerna et al., 2009)	Exogenous	Interval
Failed placement test (Bailey et al., 2008)	Exogenous	Nominal
Enrolled in semester 2 (Perin & Charron, 2006)	Endogenous	Nominal
Second semester GPA	Exogenous	Interval
Completed developmental reading course	Endogenous	Nominal
Gatekeeper grade (Bahr, 2010)	Endogenous	Interval
Enrolled in second year (Adelman et al., 2003)	Endogenous	Nominal
Second year ending GPA (Ronco & Cahill, 2004)	Exogenous	Interval
Accumulated credits (Adelman, 2004)	Endogenous	Interval
Graduated (Martorell & McFarlin, 2007)	Endogenous	Nominal

This study contributes to the literature advising policy and curriculum decision makers about the effectiveness of reading interventions in a long-term program for Hispanic males, a group that is frequently required to take developmental reading.

CHAPTER III

Methodology

Although large percentages of post-secondary students are identified as needing developmental education and many enroll in developmental courses, the research to date has been strikingly ambivalent about the efficacy of developmental work (Adelman, 2004; Attewell et al., 2006; Bahr, 2010; Boatman & Long, 2010; Calcagno & Long, 2008; Collins, 2010; Illich et al., 2004; Martorell & McFarlin, 2007; Torgerson et al., 2004). In light of the burgeoning US Hispanic population, a particular concern for educators is that Hispanic students are especially likely to be assigned to developmental courses (Adelman, 2004) and that Hispanic males are among the least likely to finish developmental courses successfully (Bettinger & Long, 2005b).

Developmental reading has been identified in the literature as an especially formidable obstacle to college success (Adelman, 1998; Bahr, 2010). This study sought to determine whether academic outcomes for male Hispanic students in a 4-year university program improved as a result of taking a developmental reading course. The study examined demographic traits, educational background characteristics, developmental education experiences, and college outcomes of students at a large public university in the Generic. The developmental reading course under consideration incorporated elements recommended in the developmental reading literature. Using

linear and logistic regression, the study compared the results for Hispanic males who took the developmental reading course with other students who also took developmental reading and with students who did not take the course. The study sought to establish what factors, including personal and academic background and developmental reading instruction, may contribute to college success for Hispanic males.

This study adds to the literature because Hispanic males in developmental reading represent a convergence of four problematic trends: the low college success rates of Hispanics, of males, and of students underprepared for college reading, as well as a distinct ambivalence in the research literature about the effectiveness of developmental education generally and developmental reading in particular.

This study employed inferential statistics (i.e., Pearson's product-moment correlation coefficient), to determine the strength of the relationship between two quantitative variables (Mertler & Vanatta, 2005). Examining developmental reading's effects for Hispanic males also presumes a context in which multiple variables will bear on the outcomes. A statistical method particularly well suited to the study of small populations when assessing the relative strength of such variables in causing specific outcomes is regression analysis.

Participants

This study was conducted at a large Texas public institution (hereinafter identified as Generic University) where about a third of the students are members of racial or ethnic minorities. African-American students at the school, though 5% of the student population, have achieved higher retention and graduation rates than White or Hispanic students due to an "enclave" of support, tradition, and scholarship that sets them apart

and above other groups on campus (Benn, 2002). Hispanics constitute almost a quarter of the student population. For academic year 2008-2009, the university's Hispanic six-year graduation and persistence rate (75.5%) was well above the norm for the rest of the state (63.8%) and was comparable to that of both Whites (77.3%) and Blacks (71.8%) attending the school (Texas Higher Education Coordinating Board, 2011a). The graduation rate for all students placed the university fifth among public universities in Texas.

Intervention

Texas has been recognized as a leader in post-secondary developmental education since the 1970s (Martorell & McFarlin, 2007). In 1987, the Texas legislature mandated that all students attending degree-granting institutions in Texas demonstrate the capacity to do college-level work (Griffith & Meyer, 1999), a requirement that went into effect in the fall of 1989 and has promoted a broad, loosely coordinated effort to improve the academic skills of underprepared students state-wide. Developmental education courses have been the focus of efforts to bring underprepared students up to standard.

The data for this study came from ten years of results from a specific semester-long course in reading improvement. The purpose of the course was to improve the student's college-level reading ability and thereby improve future academic performance by teaching strategies and critical thinking skills for greater reading efficiency and effectiveness. The course has had one instructor for all sections included in this study, enhancing the consistency of content and method across the period under investigation.

University policy allowed students who attended regularly and passed the course with at least 70 points to receive three hours of credit, but the grade did not influence the

student's GPA. Students who attended regularly but earned 60-69 points were assigned a grade of P (for "progress") but earned no credit hours. Students who earned fewer than 60 points or did not attend class regularly received a grade of F that did count on the GPA (see the course syllabus in the Appendix).

The developmental reading course that is the subject of this study uses a constructivist approach grounded in a theoretical framework incorporating situated cognition (Brown, Collins, & Duguid, 1989), strategic learning (Zimmerman, 2000), and cognitive apprenticeship (Collins, Brown, & Newman, 1987). Elements of the course that have previously been studied include instruction in metacognition (El-Hindi, 1996) and connecting developmental instruction with content courses (Cox et al., 2003).

The course teaches active reading strategies introduced first by explicit instruction and modeling by the instructor, then by guided practice followed by independent practice. The process is repeated over the duration of the semester, with a variety of authentic, college-level, text materials taken from the core classes required of all students (Caverly et al., 2004). Students are first taught to be aware of four areas when addressing academic literacy, adapted from Wade and Reynolds (1989). The semester begins with an exercise in which students are sent home with a chapter from a freshman-level text to study and return the next class period for a quiz. After the quiz in the second class period, students complete a checklist of the reading strategies they used to read the text (Caverly et al., 2004). Following these two assessments, which few pass (thus validating the placement test) a discussion ensues in which students learn about *performance awareness* based upon their success. The instructor asks which strategies they used for the task and helps them recognize that the strategies they used were not

effective for the task. This discussion helps develop *strategy awareness* and its connection to their performance awareness. The instructor next connects their answers to this discussion to the strategy checklist, helping them develop *task-awareness* for strategies they used and those they could have used. That is, the instructor helps them understand that some strategies on the checklist would have been more effective for the type of task associated with the quiz while others would be more effective for other tasks (Caverly & Orlando, 1991). This discussion combined with their self-, performance, and strategy-awarenesses affect their self-efficacy toward success in academic literacy. Students better understand that a strategic approach to academic literacy is taking responsibility to identify a task, select the correct strategy to fit the task, monitor progress toward succeeding at the task, and reflecting on its effectiveness for future tasks. This exercise and ensuing discussion builds motivation for learning strategic reading behaviors that will be more effective, metacognitively applied. Consequently, students are taught about the factors of schemata when understanding text, rhetorical patterns present in expository and narrative text, and complex rehearsal, organization strategies (Weinstein & Mayer, 1985). To help them orchestrate all of these factors, students are taught a P.L.A.N. strategy (Caverly et al., 2004) with which students Predict what a given chapter will be about and how it will meet their task for reading by creating a tentative semantic map of the chapter using the title, introduction, headings and subheadings, graphics (e.g., maps, charts, diagrams), and the conclusion. Next, they Locate on this map information of which they have strong prior knowledge by adding a checkmark, and information of which they have little or no prior knowledge by adding a question mark, thus engaging their schemata before reading. Next, they read the text Adding new

branches to their map where there are question marks and confirming where there are checkmarks, thus encouraging a close, monitored reading. Finally, they Note what they know as they match their task for reading with their ability to reproduce the map from memory (for an objective, memory recall task such as a multiple-choice, matching, fill-in-the-blanks test) or reconstruct the map to fit a new rhetorical structure (for a subjective essay or oral exam type of task). Students learn and practice this P.L.A.N. strategy over several class sessions and within a variety of discipline-based texts to develop an understanding of the purpose of the steps and see its fidelity to a variety of texts and tasks. Most importantly, students are taught to have a “plan” for reading, where they process text before, during, and after their reading (Caverly, Mandeville, & Nicholson, 1995) rather than doing “P.L.A.N.” For the second-half of the semester, students adapt this plan for reading for narrative texts as well as for critical reading, thinking, and writing tasks.

Texas has also adopted a long-range plan to improve post-secondary education state-wide, including specific enrollment targets for White, Hispanic, and Black students (Texas Higher Education Coordinating Board, 2011b). Hispanic student enrollments under the plan have increased more rapidly than others, but remain 12.2% below the state’s interim target. Developmental education is expressly identified as an instrument for rectifying the shortfall.

Instruments

The state requires all incoming students at degree-granting institutions to demonstrate their preparedness in reading, writing, and math skills prior to enrolling. The instrument used by the university in this study was the Texas Academic Skills

Program (TASP). TASP stands for a 5-part program of assessment, advising, placement, developmental education, and evaluation, but the TASP name is also applied to the test used for placement (Texas Higher Education Coordinating Board, 2004). In the fall of 2003, the TASP program was replaced by the Texas Success Initiative (TSI) and the TASP test was renamed the THEA, an acronym for the Texas Higher Education Assessment (Texas Higher Education Coordinating Board, 2010). State law permits each institution to decide what they will do with students who test below-standard on one or more of the skills, but state-wide, most students are directed into developmental courses such as reading improvement. Students who initially scored below a standard set by the state must be tested again after having taken their developmental courses. For this study, TASP will be used with reference to the state-authored placement test and the TSI with reference to the program and standards.

Data Analysis

Regression analysis is among the class of models known as general linear models. Regression analysis procedures may be used to predict the values of a dependent variable or to explain causal relationships among variables. Linear regression may be used when the dependent and independent variables are interval, nominal or mixed. Logistic regression is an extension of linear regression used in those instances when a dependent variable is nominal and has at least two values (Mertler & Vanatta, 2005).

Linear regression offers several advantages over other statistical methods for the analysis of the data in this study. Linear regression allows analysis of sample sizes as small as 10 per parameter (Hosmer & Lemeshow, 2000). In this study, the independent variables for gender, race / ethnicity, and family gross income are nominal variables;

GPA and test scores are interval variables; and the dependent variables of second semester enrollment, fourth semester enrollment, and graduation are nominal. The grade for a first semester American history course which will be used as a “gatekeeper course” is dependent but interval.

For clarity, key terms used in this study are defined here.

Key Terms

Chi-square. A statistic that describes the probability of an event.

Collinearity. A condition in which two variables have a direct linear relationship (i.e., one invariably predicts the other) (Tabachnick & Fidell, 2007).

Correlation. A measure of the association between variables (Tabachnick & Fidell, 2007).

Degrees of freedom (df). The number of values allowed to vary within a statistical procedure, usually the number of variables minus one.

Effect size. The magnitude of the change attributable to the treatment that the investigator wishes to identify for a given level of power (Mertler & Vanatta, 2005).

Gatekeeper course. A course that is generally required of all students and is required by the core curriculum of the university.

Linear regression. A type of general linear model for identifying the relationship between an independent variable and a dependent variable.

Logistic regression. A type of general linear model for identifying the relationship between an independent variable and a nominal dependent variable having at least two values (Mertler & Vanatta, 2005).

Multicollinearity. A condition in which two or more variables in a regression analysis are very highly correlated (Tabachnick & Fidell, 2007).

Odds ratio. A relative measure comparing the probability of an event occurring for two different groups.

p. The letter *p* indicates probability and ranges from 0.0 to 1.0.

Socio-economic status. Social class and economic well-being of the student's family as measured by reported family gross income.

Texas Academic Skills Program (TASP). A program of assessment, advising, placement, developmental education, and evaluation established in Texas in 1986 to assure that students in the state's public post-secondary schools had the requisite academic skills for academic success. TASP is also the name of the test used for assessment of reading, writing, and math performance.

Texas Success Initiative (TSI). The successor to the TASP program, effective in fall, 2003.

Population and Sample

The school that is the subject of this study is a large state university in Texas. While this institution draws its population from every county in the state and every state in the nation, the student body is overwhelmingly from the southeastern and central portion of the state. During the time of this study, the demographic distribution for the metropolitan statistical area surrounding the university was about 60% White, 25% Hispanic, and 10% Black (U.S. Census Bureau, 2000b). Of the Hispanic college-age population in the same region, just over 75% was of Mexican or Central American heritage (U.S. Census Bureau, 2000a).

The university enrolled a total of 28,623 freshmen between 1994 and 2004. During this time, Black students accounted for an average of 5.1% of the university's enrollment, while 17.6% were Hispanic, and 74% were White. All other students (Asian & Pacific Islanders, American Indian & Alaskan native, non-resident internationals, and those for whom race and ethnicity were unknown) constituted just 3.1% of freshmen. Relative to the surrounding metropolitan statistical area university data indicated that enrollments were disproportionately White, but by 2010 the share of White students dropped 5%, to 67%, off-set by a comparable surge in Hispanic enrollments.

The sample for the study was drawn from all Hispanic male freshmen entering the institution. Entering students were administered the TASP, a standardized reading proficiency test developed by the state of Texas that was used for placement into all developmental course work, including reading, which is the course of interest in this study. Although some students took other tests permitted by the state, the TASP (and the THEA, as the TASP was re-named in 2003) was the most common test taken and only those who took the TASP were considered for the study. Students who scored below the cut score² and enrolled in developmental reading (the "takers") were the treatment group. Two comparison groups were identified: students who failed the TASP by scoring below the cut score and did not enroll in developmental reading ("skippers") and others who passed the TSI standard by scoring above the cut score and were therefore exempt from developmental reading (hereinafter, "passers"). Additional analysis was done using two sub-groups of takers, the takers-P who received passing grades in the developmental

² The cut-score rose from 220 to 230 in fall, 1995, in response to the state legislature's mandate that up to 15 percent of entering freshman be exempted (Texas Higher Education Coordinating Board, n.d.).

reading course, and takers-FW who received F (failing) or W (withdrawn) grades for developmental reading.

Given the emphasis in the literature review on first and second generation immigrant status of students and on the diversity within ethnic groups (c.f., Lopez, 2009; North, 2009), it is appropriate to note that the student population of this university is drawn from a region that is predominantly Hispanic of Mexican origin. The university's data did not allow for inferences about national origin, citizenship, immigration status, or duration of a student's or family's residence in the US, however, Texas offers in-state tuition for undocumented students, and state-wide data from 2011 indicate that fewer than 1% of students in Texas' public post-secondary institutions participated in the program (Texas Higher Education Coordinating Board, 2011c).

Parents' education was suggested by the literature as an important predictor of academic achievement. The variables of mothers' and fathers' education were tested for collinearity with family gross income using a sample of Hispanic males that included takers ($n = 74$), skippers ($n = 53$), and a randomized sample of passers ($n = 74$). Under these conditions, a one-way analysis of variance (ANOVA) showed that mothers' and fathers' education correlated closely with family gross income, displaying no significant difference at the .05 level (Table 2). Parents' education was thereafter omitted in favor of family income due to collinearity.

Table 2

Parent's Education and Family Income Collinearity

	df	F	η	p
Family income	.210	.210	.84842	.811
Mother's Education	.046	.046	.038081	.955
Father's Education	1.169	1.169	.190625	.317

Age, part-time enrollment, and urban or rural school background were not included because the available data set did not include these factors. The university, though, states that the total student population is highly homogenous for these factors (Generic University, 2010a).

Identification of exogenous and endogenous variables.

The demographic and academic variables above were selected on the basis of the review of the literature describing post-secondary developmental education. Two aspects of developmental reading—failing a reading placement exam and completing a developmental reading course—were selected as moderating endogenous variables because they were the variables pertinent to this study's goal of understanding the value of developmental reading in promoting college success.

Gender, race and ethnicity, family gross income, SAT and ACT college admissions test scores, and high school GPA were considered exogenous variables because they were not caused by any of the other variables in the study and earlier research had shown each of them to influence academic achievement. Looking at all of the White, Black, and Hispanic students in the university, a one-way ANOVA performed on a sample that included all takers ($n=588$), all skippers ($n=360$) and a randomized sample of passers ($n=588$), showed no significant differences between the groups for any of the factors ($p < .05$).

Table 3

Exogenous Variables for Passers, Skippers and Takers

	n	df	F	η	<i>p</i>	sd
Race / Ethnicity	1536	2	33.927	.042386	.000	.880
Family Income	542	2	14.466	.050942	.000	1.463
HS GPA	1055	2	11.386	.021186	.000	.37217
SAT Verbal	1267	2	163.859	.20589	.000	68.542
ACT English	1510	2	.765	.0010414	.466	9.494

Dependent variables were: grade in a reading-intensive introductory American history gatekeeper course, second semester enrollment, second semester GPA, second year enrollment, second year GPA, accumulated credits at the time the student left the university, and graduation status.

For second year enrollment, the fourth semester was chosen as the relevant measure of persistence. Although the fourth semester was the end, rather than the start, of the second year, this choice was justified by the fact that another measurement of persistence in this study, second semester enrollment, was also a measure of end-of-year enrollment, and by the fact that fourth semester enrollment was congruent with the fourth semester GPA measure that was part of this study as well.

An Introductory American history course (hereafter history) was chosen for this study as a gatekeeper course because it was designated by the university as an intensive reading course, and it was required for all students graduating from the university. This course was enrolled in by 79.8% of the students in the data set, further justifying the choice of this course as a gatekeeper course.

Demographic description by variables

Family income was reported by just half of the university's freshmen. Of the more than 14,000 students reporting family income, only 7 indicated incomes above

\$99,999, but this figure seems low and may well be explained by the fact that upper-income families have fewer incentives to report income to qualify for need-based scholarships and grants³ (Table 4).

Table 4

Reported Family Income of All Students

< \$40,000	12.3%
\$40,000—\$59,999	8.9%
\$60,000—\$79,999	8.5%
\$80,000—\$99,999	19.9%
>\$99,999	<1%

While 49.6% of all students reported family gross income, 52% of Hispanic males did so. The family incomes reported by Hispanic Males were lower family than for the school population as a whole (Table 5).

Table 5

Reported Family Income of Hispanic Males

< \$40,000	23.3%
\$40,000—\$59,999	9.7%
\$60,000—\$79,999	7.6%
\$80,000—\$99,999	11.4%
>\$99,999	<1%

A slightly larger proportion of students (55%) reported their parents' education levels. The largest group indicated that at least one of their parents had some college (Table 6).

³ Among those reporting father's education but not income, over 46% said their fathers had a 4-year degree or more. Since father's education exhibited a .319 Pearson's correlation with income (significant at the .05 level, N=14198), it is reasonable to conclude that at least a comparable portion of those for whom income data was unavailable would come from families earning \$100,000 or more.

Table 6

Parents' Education for All Students

	Father	Mother
High school diploma, G.E.D., or less	12.6%	13.9%
Some college but less than a 4-year degree	16.1%	15.8%
4-year degree	16.9%	15.8%
Graduate or professional degree	9.1%	7.0%

Many of the Hispanic males also reported that at least one parent attended college, but the largest group indicated that their parents, and particularly their mothers, had no college experience (Table 7). Of the 29.7% of the mothers without a college background, most (16.6%) were high school graduates.

Table 7

Parents' Education for Hispanic Males

	Father	Mother
High school diploma, G.E.D., or less	14.0%	29.7%
Some college but less than a 4-year degree	14.5%	16.2%
4-year degree	10.1%	8.8%
Graduate or professional degree	6.3%	5.8%

Instrumentation

The data for this study were provided by the university that is the site of the developmental reading program under consideration. The data drew from the years 1994 to 2004. A ten-year period was used to acquire a sample large enough to be statistically useful. The data ended in 2004 because the data were the most recent available that allowed 6-year graduation rates to be examined.

This data was analyzed using the *IBM Statistical Package for the Social Sciences* (SPSS) version 19.0 software program.

Data Analysis

The data obtained from the university were first analyzed using correlational statistical methods to develop a logistic regression model to investigate cogent relationships among the variables. Because multicollinearity can create logical and statistical problems when analyzing multivariate regression statistics, the study tested the variables for multicollinearity.

Data screening.

Because students who did not identify themselves as Black, Hispanic or White were about 3% of the university's freshmen and appeared infrequently in developmental courses, the data used to analyze developmental education, including developmental reading, were screened to count only those freshmen identifying as Black, Hispanic, or White. As part of the screening process in SPSS, missing values had to be defined. For example, race with a value of "0" was defined as a missing value. Variables for mother's and father's education were initially considered but eventually eliminated due to collinearity with family gross income (Table 2).

The most problematic condition appeared when screening for student status vis-à-vis TSI placement. Over-all, 40.9% of student records had no reading placement information available. Given the state mandate that schools establish the readiness of new students, the missing data is likely to have been due to students satisfying TSI requirements before enrollment through SAT or ACT scores, having prior college credits (such as through early college start programs in high schools), military service, or transfer credits from private or out-of-state institutions. Because the focus of the study is

on the performance of students who did not meet TSI standards, the absence of this data is disappointing but not critical.

Logistic regression is sensitive to the ratio of cases to predictive variables. When the case-to-variable ratio is too small, outcomes may be unreliable. The accepted minimum ratio of cases to variables is 20:1 (Princeton University Data and Statistical Services, 2007), a standard that was met in this study.

Summary

This analysis first focused on the variables or combinations of variables that were statistically significant in predicting success for students who took a developmental reading course. A model for the sample was developed using logistic regression, since it can be used to fit and compare models (Tabachnick & Fidell, 2007). In this model, the independent or predictor variables were tested for statistical and practical significance. Prior to developing the models, the data were screened to assure that data obtained met the requisite assumptions for logistic regression analysis.

Though this study used data from Hispanic male students at a single institution, the information gained from the model may help college and university personnel elsewhere better understand the effect of the variables included in relation to their own schools. The goal was to provide information that will help school administrators and faculty increase the success rates of Hispanic males directed to developmental reading.

CHAPTER IV

Analysis of the Data

This study examined the outcomes of Hispanic males attending a public 4-year university in Texas who took a standardized reading placement examination and were identified as needing developmental reading. Using secondary data provided by the university, the study compared the performance of students who passed the TSI and did not take developmental reading (passers) with others who failed the TSI and took the recommended developmental reading course (takers), and similar students who also failed the TSI but did not enroll in the developmental course to which they had been recommended (skippers). These three groups were compared on the basis of seven variables previously identified as indicators of student success.

The first objective of this chapter is to describe the variables and sample for this study. The second objective is to present the results of the data analyses for the Hispanic male student sample.

Variables

Independent variables.

The literature reviewed in chapter two of this study suggested numerous variables that are both relevant to the study and available in the data at hand. The variables used to answer the research question were demographic traits of gender, race and ethnicity, family gross income, college admissions test scores, high school GPA, and failing a

reading placement exam. These were independent exogenous variables which earlier research had shown to influence academic achievement.

Dependent variables.

The dependent endogenous variables used in this study were: completing a developmental reading course, second semester GPA, fourth semester GPA, grade in a reading-intensive gatekeeper course, accumulated credits, and graduation. Prior research described in the literature review identified these variables as pertinent to understanding the value of developmental reading in college success and as indicative of both academic achievement and persistence.

Sample

The institution in which this study was undertaken, identified as Generic University, enrolled 28,623 new incoming freshmen between 1994 and 2004. By 2004 the proportion of Whites was shrinking as the share of Hispanic students grew to nearly a quarter of the population and Black enrollment remained stable. Other students, who variously identified as Asian & Pacific Islanders, American Indian & Alaskan native, non-resident internationals or for whom race and ethnicity were unknown made up a small share. Because the number of these “other students” was low and constituted 4.2% of the students taking developmental reading, only Blacks, Hispanics, and Whites were included in this study.

Nationally during this ten-year period the comparable figures for college enrollment were 11.3% Black, 9.5% Hispanic, and 68.3% White (Snyder & Hoffman, 2002, Table 177). Enrollments for Blacks at the university were, therefore, somewhat

below national averages, while enrollments for Whites and Hispanics exceeded national averages.

Population Description

The predominance of women observed in undergraduate programs during this same period nationally (Snyder & Hoffman, 2002) was somewhat greater in the university, where females occupied about 60% of classroom seats throughout the decade (Generic University, 2010a). Ethnic and gender distribution of the university's freshmen during the period of the study is presented in Table 8.

Table 8

Ethnic and Gender Distribution of Freshmen, 1994-2004

		Gender			
		Female	Male	Total	
Ethnicity	Black	Count	900	565	1,465
		% of Total	3.1%	2.0%	5.1%
	Hispanic	Count	2,977	2,059	5,036
		% of Total	10.4%	7.2%	17.6%
	White	Count	12,832	8,352	21,184
		% of Total	44.8%	29.2%	74.0%
	Other	Count	539	399	938
		% of Total	1.8%	1.3%	3.1%
Total		Count	17248	11375	28,623
		% of Total	60.3%	39.7%	100%

The Texas Success Initiative (TSI) is a state requirement to confirm the college-readiness of beginning freshmen at public post-secondary schools. In 2003, it succeeded the Texas Academic Skills Program, which had similar goals. With the change in program name came a change in the name of the testing instrument used, from the TASP to the THEA (Texas Higher Education Assessment) (Texas Higher Education Coordinating Board, 2004, 2010). Also as of 2003, schools were permitted to use any of several approved commercially prepared tests (Texas Higher Education Coordinating

Board, 2010), but the one most commonly used, and the one used by Generic University, and the one used by this study, was the TASP/THEA, developed by the state itself.

Important questions have been raised about the validity of placement tests for developmental education (Hughes & Scott-Clayton, 2011). Such questions deserve careful consideration, but the validity of the placement tests used by Generic University is beyond the scope of this study and will not be undertaken here. Using the placement tests as part of this study is justified, in part, by the fact that the tests have been used in prior research in Texas (e. g., Boylan & Saxon, 2005; Caverly, 1997; Martorell & McFarlin, 2007; Miller, 2007). Furthermore, Griffith and Meyer (1999) determined previous versions of the placement instrument to be valid, though they conceded that “it is hard to make comparisons of TASP performance and remediation results over time, since the rules of the game have changed so often” (p. 107).

As a result of the placement process, 1876 students (6.4%) enrolled in at least one developmental math, reading, or writing course over the ten year period of the study. This was far fewer than the 24% of students predicted to need remediation on the basis of state-wide averages for other four-year schools (Generic University, 2010a; Texas Higher Education Coordinating Board, 2002). Of the students who did enroll in developmental courses, 1057 (56.3%) were women, and 819 (43.7%) were men, meaning that, relative to their share of the student population, males were over-represented in developmental education by 3.9%.

For developmental reading specifically, 948 (6.3%) incoming freshmen were identified as needing developmental classes. Black males fell below the TSI standard for reading more often than any other group. Black females and Hispanics, both male and

female, failed the TSI in roughly similar proportions, while Whites constituted a numerical majority of TSI failers but a relatively small percentage of White students overall. The ethnic and gender distribution of these students appears in Table 9.

Table 9

Ethnic and Gender Distribution of Students Failing TSI Reading

Ethnicity		Gender				Total	
		Female		Male			
Ethnicity	Black	75	10.8%	62	15.5%	137	12.5%
	Hispanic	185	8.9%	127	9.4%	312	6.2%
	White	290	2.3%	209	2.5%	499	4.2%

Table 10 compares the percentage of students failing and being recommended into developmental reading with the percentage of students taking the classes. Females were less likely than males to fail the TSI and were also less likely to take developmental reading if they did fail. Among a random sample of 25% of all Black, Hispanic, and White freshmen, a high rate of failing the TSI generally corresponded to a low rate of avoiding developmental reading as shown by a Pearson's r of $-.168$ ($p < .05$, $n = 3775$). The notable exception was Hispanics males, who, relative to others, had high rates for both failing the TSI and skipping developmental reading. The anomaly is noted but the study was not able to explain why Hispanic males were more likely to skip developmental reading than their peers.

Table 10

Failed TSI Reading versus Took Developmental Reading

		% who failed TSI	% of TSI failers who took reading
Female	Black	10.8%	73.3%
	Hispanic	8.9%	64.3%
	White	3.8%	54.1%
	gender avg.	5.3%	60.2%
Male	Black	15.5%	74.1%
	Hispanic	9.4%	58.3%
	White	4.9%	65.5%
	gender avg.	6.6%	64.6%

Table 11 displays the results of logistic regression analyses comparing all of the university's Black, Hispanic, and White skippers to all of the Black, Hispanic, and White takers on a variety of demographic traits previously described in the literature. Because as many as 50% of freshmen did not report on some independent variables such as family income, the empty or "unknown" responses were omitted when performing analyses of the variables. Under these conditions, none of the traits were significant at the .05 level.

Table 11

Demographic Traits of All Generic U. Takers and Skippers

Variable	χ^2 value	p	Odds Ratio	N
Gender*	1.888	.169	1.206	948
Race	1.516	.218		948
Family gross income	.339	.560		303
HS GPA	.084	.772		641
SAT verbal	1.688	.194		517
ACT English	.102	.750		927

*Binary logistic regression

To determine whether the TSI scores for the passers, takers, and skippers were significantly different, an ANOVA comparing all of the university's takers and skippers (male, female, Black, Hispanic, and White) plus a randomized sample of all the passers (also male, female, Black, Hispanic, and White) was performed. The results, displayed in Table 12, indicate that, across the whole student population, while mean scores for the passers are higher than for takers and skippers, the difference is not large enough to be statistically significant.

Table 12

TSI Scores of Passers, Takers, and Skippers

	n	mean	sd	<i>p</i>
Passers	588	260.94	15.77	.000
Takers	588	243.12	28.53	
Skippers	360	242.14	24.52	

The 588 students who eventually enrolled in developmental reading (2.1% of the university's freshman population) exhibited broad demographic similarities. Under these conditions, the strongest results of a two-tailed Spearman's rho correlation for enrolling in developmental reading were race/ethnicity (.092), family gross income (-.070), high school rank percentile (-.044), and high school GPA (-.025), none of which were significant at the .05 level.

The subject of this study was the sub-group in developmental reading who were Hispanic males. A large majority (93.8%) of the 2059 Hispanic male freshmen entering the university met TSI reading standards either prior to admission or upon entering the university. Of these 127 students (6.4%) who did not meet the standard and were determined to need developmental reading, 74 became takers and 53 became skippers. Fourteen Hispanic males met the TSI standard and were exempt from developmental reading, but chose to take the class anyway. These 14 were excluded from all calculations

regarding the efficacy of the developmental reading course. For more in-depth inquiries, takers were sub-divided into those who passed the developmental reading course (takers-P) and those who earned a grade of either F or W (takers-FW).

Table 13 displays the results of logistic regression analyses comparing Hispanic male passers, takers, and skippers on the same demographic traits noted in Table 11 for all students as well as on TSI scores. As before, because many freshmen did not report on some independent variables, the empty or “unknown” responses were omitted. Under these conditions, none of the traits, including the TSI score by which students were placed into developmental reading, were significant at the .05 level.

Table 13

Demographic Traits of Hispanic Male Takers and Skippers

Variable	χ^2 value	<i>p</i>	n
Family gross income	0.144	.705	40
HS GPA	1.363	.243	90
SAT verbal	.010	.919	109
ACT English	1.026	.311	131
TSI score	.121	.728	126

An initial examination of the data suggested that takers-FW came predominantly from families with gross incomes below \$40,000. In fact, a closer look revealed that the Hispanic male takers-FW did come from this low SES category, but the sample consisted of only 3 members. By comparison, of the 27 Hispanic males in the takers-P group, 15 (55%) came from the same 2 bottom SES categories. This trend mirrored a similar trend for all Black, Hispanic, and White takers-FW and takers-P; of the 228 students so

defined, 58.3% of the takers-FW reported family gross incomes below \$40,000, while 49.1% of the takers-P were in that category.

Some students enrolled in multiple developmental courses. Of the Black, Hispanic, and White students in developmental reading, 441 took only reading, but another 147 enrolled in reading plus at least one additional developmental course. The multiple-course enrollments for developmental reading students are displayed in Table 14. Males—particularly Black and Hispanic males—were more likely than females to enroll in multiple developmental education courses and less likely to graduate. Hispanic males were, in fact, the least likely to graduate, though Black males were much more likely to bear the burden of additional developmental courses.

Table 14

Enrollment in Multiple Developmental Courses

Gender & Race/ethnicity	Rdg only	Rdg+ Eng	Rdg+ Math	Rdg+Eng +Math	Total Rdg	% with multiple DE classes	% graduated
BF	37	10	5	3	55	32.73%	41.8%
BM	13	16	15	2	46	71.74%	32.6%
HF	95	9	7	8	119	20.17%	38.7%
HM	42	27	3	2	74	43.24%	28.4%
WF	134	7	12	4	157	14.65%	49.7%
WM	120	10	6	1	137	12.41%	36.5%
Male	175	53	24	5	257	31.91%	41.7%
Female	266	26	24	15	331	19.64%	48.9%
All	441	79	48	20	588	25.00%	46.1%
% graduated	54.88%	22.78%	16.67%	15.00%	46.09%		

Given the high proportion of Hispanic male students in multiple developmental courses, including English, the question arose whether Hispanic males skipped reading because they instead enrolled in other developmental classes. In fact, 16 Hispanic male

skippers⁴ did enroll in English, math, or both. Eight of these (15% of the Hispanic male skippers) enrolled in English. Fewer than a third of the skippers, then, might have bypassed developmental reading because they were occupied with some type of other developmental work.

Another consideration when interpreting the data is that the conceptual simplicity of the developmental placement and treatment process is belied by the complexity of the process in practice. Generic University students may fall into any of six different outcome categories:

1. Satisfied the TSI and did not need developmental reading (passers)
2. Satisfied the TSI but took developmental reading anyway
3. Did not satisfy the TSI but skipped developmental reading (skippers)
4. Did not satisfy the TSI, took developmental reading, and passed the course (the majority of the takers)
5. Did not satisfy the TSI, took developmental reading, and earned a P “progress” grade, signifying that they did not merit an F (for failure) or W (for withdrawn), or had not made enough progress to pass the course either (included among the takers)
6. Did not satisfy the TSI, took developmental reading, but earned an F or W (also included among the takers).

When considering Hispanic males only, the numbers of students in categories 2, 5, and 6 were relatively small, from 8 to 14 students, maximum. In addition to the small sample sizes, questions arose concerning the meaning of these categories. For category

⁴ These students were not included in Table 12 because they did not take any developmental reading classes

2, a student who met the TSI standard but enrolled in the course was presumed to read well enough for college work even before beginning the course, though the student enrolling apparently disagreed. For category 6, a grade of F or W implied that a student lacked the ability to continue, was absent too often, or chose not to complete enough class assignments to pass, but the student may instead have re-taken the TSI, demonstrated the required level of reading proficiency, and stopped attending (thus receiving an F) or withdrawn because the class was no longer required.

Because these categories are ambiguous they are noted, but their results need to be interpreted with particular care. One way of accounting for this uncertainty in the analysis was to distinguish between the two types of takers previously noted, the takers-P described in category 4 and the takers-FW, described in category 6. Those few in category 2 whose TSI scores had exempted them from developmental reading yet enrolled in the course nevertheless were not included among the takers because the study's goal was to determine whether developmental reading benefitted specifically those who had been identified by the TASP as underprepared.

Any study of educational program efficacy such as this one should account for the social and academic backgrounds of the sample groups (Adelman, 2006; Swail, Cabrera, Lee, & Williams, 2005a). It has also been recommended (Levin & Calcagno, 2007) that studies of developmental education's effectiveness include students who were assessed as needing developmental courses along with those who enrolled and those who finished, since studying only those who enrolled or completed developmental education creates a self-selected population that has the potential to bias outcomes. Researchers are advised to avail themselves of opportunities where state mandates set cut-scores below which

students must take developmental classes. Such mandated cut-scores promise to minimize the methodological problem that arises when students opt into or out of courses themselves and reduce the chance that comparison groups are self-selected.

Texas, the site of this study, has such a mandate for all degree-granting institutions. However, as with most such mandates (Perin, 2006), avenues for circumvention abound. Students may, for example, be exempted if they have three years' military service or transferred credits in specific courses from private, independent, or out-of-state schools (Texas Higher Education Coordinating Board, 2010). The students who failed the reading assessment but did not take developmental reading had the potential to provide a natural comparison group for further study. The difficulty with using them as a natural comparison group, as Levin and Calcagno (2007) cautioned, is that they are self-selected and, therefore, might not be truly comparable to the group taking reading. Under these circumstances, additional regression analyses were run on each of the independent variables to determine whether, for Hispanic males, these skippers differed from takers. The regression analyses results showed that skippers were not significantly different ($p < .05$) from takers for any of the demographic variables used in this study: family gross income, mothers' or fathers' education, high school GPA, ACT English score, or SAT verbal score (Table 11). Skippers' and takers' TSI scores also showed no significant difference (Table 11; $p < .05$). Consequently, for this study, the skippers did constitute a valid comparison group.

An examination of the sample by gender (Table 15) reveals that males were more likely than females to enroll in developmental reading. The difference between the genders was .8% for Black students, 6% for Hispanics, and 11.4% for White students.

For Blacks and Whites, men were more likely to enroll than women, but for Hispanics the order was reversed.

In terms of race and ethnicity, Hispanic students accounted for 21% of entering freshmen, but 32.9% of students who failed to satisfy the TSI standard and 32.8% of students who took developmental reading. Hispanics were 16% more likely to score below the TSI standard than Whites. This ethnic disparity echoes a difference in Table 14 showing that later, when it came time to graduate, Hispanic females graduate less often than other females in developmental reading, and Hispanic males graduated less often than any others.

Table 15

Ethnic and Gender Distribution of Developmental Reading Students

Ethnicity		Gender		Total
		Female	Male	
Black	Count of TSI failers	75	62	137
	% of TSI failers	7.9%	6.5%	14.4%
	Count of takers	55	46	101
	Takers as a % of failers	73.3%	74.1%	73.7%
Hispanic	Count of TSI failers	185	127	312
	% of TSI failers	19.5%	13.4%	32.9%
	Count of takers	119	74	193
	Takers as a % of failers	64.3%	58.3%	61.8%
White	Count of TSI failers	290	209	499
	% of TSI failers	30.5%	22.0%	52.6%
	Count of takers	157	137	333
	Takers as a % of failers	54.1%	65.5%	66.7%
Total	Count of TSI failers	550	398	948
	% of TSI failers	58.0%	41.9%	100%
	Count of takers	331	257	588
	Takers as a % of failers	60.2%	64.6%	62.0%

The ethnic and gender distribution of the developmental reading students during the period of the study are displayed in Table 15. The category labeled “% of TSI failers” describes the share of all university freshmen who failed the TSI and were placed in developmental reading, while “takers as a % of failers” describes what share of those

who failed the TSI and were placed in developmental reading actually went on to enroll in a developmental reading course.

Data Screening

A demographic review of full-time freshmen enrolled at the university showed 96.9% of the students to have self-identified as Black, Hispanic, or White. Since the sample sizes for non-Black, Hispanic, or White students were too small for valid statistical analyses, they were not included in the study of developmental reading effectiveness.

The pool of Black, Hispanic, and White students was sorted first for those who had satisfied the reading standard for the TSI, and were determined to not need developmental reading. This group included a small number who, despite having satisfied the TSI standard for reading, nevertheless enrolled in the developmental reading course. This small voluntary group was excluded from the group that is the focus of this study who failed the TSI and took reading (“takers”) and accounts for an apparent discrepancy between the number enrolled in reading and the number included in the study.

Second, the pool of Black, Hispanic, and White students was sorted for those who had not satisfied the reading portion of the TSI and had taken a developmental reading course. In some instances, this group of takers was also sorted into those who had passed the course and those who had earned either a W (withdrawn) or F (failing) grade. Third, the pool of Black, Hispanic, and White students was sorted for those who had not passed the TSI but who did not take the developmental reading course. Last, these samples were stratified by gender and ethnicity.

Data for some independent variables were unavailable for some students, either because the students did not report the information or because university records were incomplete. Consequently, analysis of predictors for success used only students for whom the data were complete. In addition, preliminary tests of the data revealed several variables, such as mother's education, father's education, and family gross income, to approach collinearity. In these instances, only the most influential variable—family gross income—was used.

Some students do not attend school on the traditional fall / spring semester schedule, with summers off. In a calendar year, therefore, a student could take classes for three semesters. The effect of these differences on variables that employed data by semester—second and fourth semester enrollment and second and fourth semester GPA—were not considered consequential to the study. No distinctions were made between summer and other semesters when analyzing enrollment or GPA data.

Findings and Model Fit

The questions were answered by running regression analyses on SPSS version 19 using Generalized Linear Modeling. The sample for each analysis drew from three groups of Hispanic males: skippers ($n = 53$) who had been placed in developmental reading but did not enroll, takers ($n = 74$) who had been placed in developmental reading and chose to take the course, and a randomized sample of passers ($n = 74$) who were deemed by TSI standards to not need developmental reading. In each case, the significance is measured by the Wald Chi-square. The Wald Chi-square is calculated by dividing the beta by the standard error of measure.

Question one asked how well moderating variables (placement and enrollment in developmental reading, placement but no enrollment in developmental reading, not placed in developmental reading) predicted the success of Hispanic males in a 4-year university as measured by a grade in a gatekeeper course. History, a reading-intensive, introductory-level, American history course was chosen as the gatekeeper course because it is required of all students and is named in the university catalog as one of the classes by which a student may satisfy the reading proficiency requirement for the TSI (Generic University, 2010b).

To ascertain whether reading was in fact related to success in history, a two-tailed Pearson correlation was performed with a sample of Hispanic males that included skippers ($n = 53$), takers ($n = 74$), and a randomly selected group of passers ($n = 74$). The reading test scores and history grades were significantly correlated at the .05 level ($r = .268, p = .002$).

Table 16 displays the academic outcomes of logistic regression analyses for three groups of Hispanic males, earlier described as passers, skippers, and takers. Skippers and takers took history in almost identical proportions—38 of the original 53 skippers (71%) and 52 of the original 74 takers (70.3%). The results identify no significant difference at the .05 confidence level in the history grades of the skippers and takers ($\chi^2 = .833$ with $p = .362$). Results for passers, however, were significantly higher ($\chi^2 = 5.692$ with $p = .017$).

Table 16

Academic Outcomes for Passers, Skippers, and Takers

	TSI Status	χ^2 value	<i>p</i>	Odds ratio	Mean	SD	n
History grade	Passers	5.692	.017		1.89	1.088	158
	Skippers	.833	.362				
Second semester enrollment*	Passers	.490	.484	1.533			197
	Skippers	.797	.372	1.762			
Second semester GPA	Passers	2.301	.129		2.1114	.67235	167
	Skippers	2.285	.131				
Fourth semester enrollment*	Passers	.0334	.853	1.075			197
	Skippers	.832	.362	1.450			
Fourth semester GPA	Passers	8.688	.003		2.3577	.54137	119
	Skippers	2.773	.096				
Accumulated credit hours	Passers	6.420	.011		66.4627	53.90584	201
	Skippers	.059	.808				
Graduation*	Passers	4.145	.042	.492			196
	Skippers	.049	.825	.916			

*binary logistic regression

The value of the history grade comparison is compromised if, by the time students have taken their history course, the winnowing process has disproportionately eliminated less able skippers or takers. However, when the maximum TSI scores of the skippers and takers were compared using an independent samples t-test, at the .05 level of confidence, there was no statistically significant difference between skippers and takers who took history ($t = .71$, $df = 78$, $p = .48$).

Table 17

Means Comparisons of Academic Outcomes

	Passers			Skippers			Takers		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
History grade	68	2.10	1.01	38	1.84	1.15	52	1.63	1.10
2nd semester enrollment	74	.92	.27	53	.68	.47	74	.85	.36
2nd semester GPA	68	2.17	.70	36	2.20	.63	63	2.0	.66
4th semester enrollment	74	.68	.47	53	.49	.50	74	.58	.50
4th semester GPA	50	2.50	.54	26	2.39	.49	43	2.18	.54
Accumulated credit hours	74	80.92	56.07	53	56.70	52.67	74	59.00	50.04
Graduation	74	.46	.50	53	.30	.46	74	.28	.45
SAT Score	67	478.06	69.79	39	419.23	69.94	63	421.43	66.31
Maximum TSI Score	70	260.91	18.19	53	239.60	32.01	73	241.30	23.29

Table 17 provides another comparison of history grade outcomes between the passers, skippers and takers. Mean scores indicate that passers performed better in history than the skippers or takers, but the skippers also earned higher grades than the takers.

Question two asked how well the moderating variables predict the success of Hispanic males in a 4-year university as measured by enrollment in the second semester. Table 16 shows the results of the binary logistic regression analysis of the 53 skippers compared to 74 takers. For the dichotomous outcome variables of enrollment and graduation, the table displays the odds ratio [expressed as $\exp(\beta)$]. An odds ratio of 1.0 signifies that the independent variable has minimal practical effect on the dependent variable; an odds ratio greater than 1.0 implies that the independent variable increases the likelihood of an event for the dependent variable. The results indicated that takers were

not significantly more likely than skippers to enroll in the second semester at the .05 confidence level ($\chi^2 = .797, p = .372, \exp(\beta) = 1.762$).

When question two is examined with passers in mind, the results in Table 16 indicate that, while passers are more likely to enroll in the second semester, at the .05 level of confidence, the difference is not statistically significant ($\chi^2 = .490, p = .484, \exp(\beta) = 1.533$). These results appear again in the means comparisons in Table 17; 92% of passers and 85% of takers enrolled in the second semester, compared to 68% of skippers.

Question three asked how well the moderating variables predicted the success of Hispanic males in a 4-year university as measured by second semester GPA. The means comparison in Table 17 shows passers to have a higher mean GPA than either skippers or takers, but that skippers also earned higher GPAs than the takers. The results of the regression analysis displayed in Table 16 show no significant difference between the second semester GPAs of the 36 skippers and the 63 takers ($\chi^2 = 2.285, p = .131$). Table 16 shows that the passers' (n = 68) higher second semester GPAs were not statistically significant, at the .05 level of confidence ($\chi^2 = 2.301, p = .129$).

Question four asked how well the moderating variables predicted the success of Hispanic males in a 4-year university as measured by enrollment in the second year / fourth semester. By the start of the fourth semester, 51% of the skippers had dropped out, as had 42% of the takers and 32% of the passers (Table 17). The results of the regression analysis in Table 16 indicate that the difference in the likelihood that takers (n = 74) would enroll in the second year compared to skippers (n = 53) was statistically insignificant ($\chi^2 = .832, p = .362, \exp(\beta) = 1.450$). Passers also displayed a likelihood of

enrollment in the fourth semester that is not, at the .05 level, significantly different from that of takers ($\chi^2 = .0334$, $p = .853$, $\exp(\beta) = 1.075$).

The difference in outcomes between second semester enrollments and fourth semester enrollments is further illuminated by the percentage of drop-outs in each category displayed in Figure 1. The percent of Hispanic male skippers at the university experienced a marked enrollment drop through the 4th semester. However, beyond the 4th semester skippers remained in school as long as the takers. The two sub-groups of takers, labeled takers-P and takers-FW, are included in the graph, showing a distinct difference between the takers-FW and all other students.

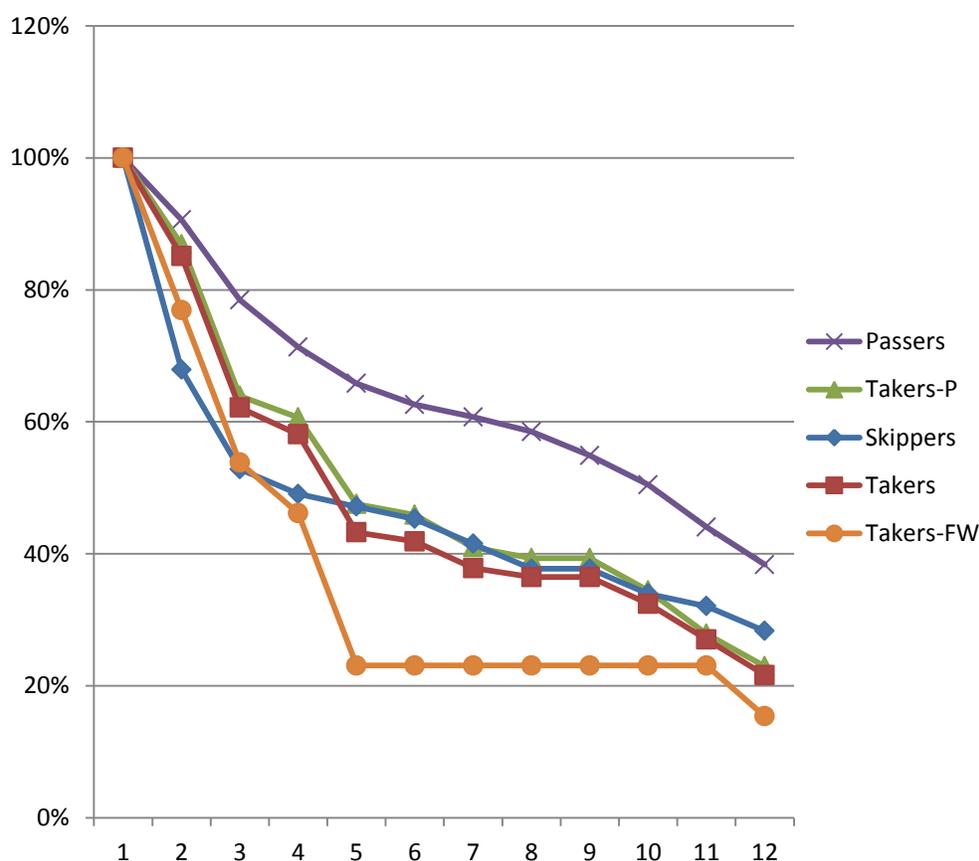


Figure 1. Hispanic Male Enrollments Across 12 Semesters

Question five asked how well moderating variables predict the success of Hispanic males in a 4-year university as measured by the GPA at the end of the second year / fourth semester. As shown in Table 16, the results of the regression analysis indicate no significant difference between skippers ($n = 26$) and takers ($n = 43$) ($\chi^2 = 2.773, p = .096$). By comparison, results for passers ($n = 50$) show a significantly higher GPA than takers ($\chi^2 = 8.688, p = .003$).

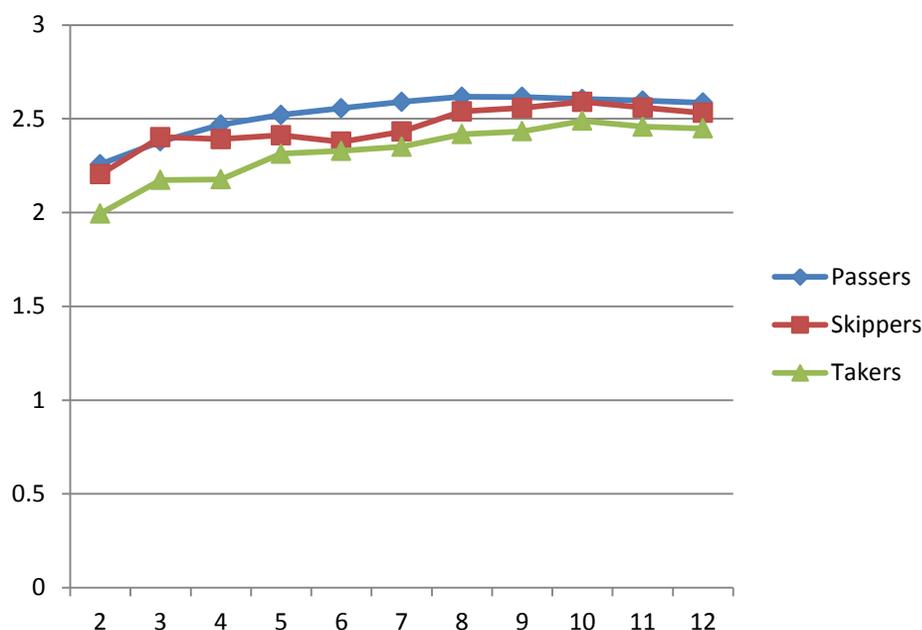


Figure 2. Hispanic Male GPA Means Across 12 Semesters

Another view of GPA performance by the three groups appears in Figure 2, which displays the GPA means of the passers, skippers, and takers for 12 semesters. As Figure 2 showed, GPAs for skippers in the second semester and thereafter generally struck a middle course between the average GPAs of passers and takers, though the differences were statistically insignificant.

Question six asked how well moderating variables predict the success of Hispanic males in a 4-year university as measured by accumulated credits at end of enrollment at

the university. As shown in Table 16, the results of regression analysis indicate that skippers ($n = 53$) were somewhat less likely to accumulate as many credit hours as takers ($n = 74$), but at the .05 level of confidence, the difference was not statistically significant ($\chi^2 = .059, p = .808$). On the other hand, passers earned significantly more college-level credit hours than did the takers ($\chi^2 = 6.420, p = .011$).

Question seven asked how well moderating variables predict the success of Hispanic males in a 4-year university as measured by graduation. The means comparisons of Table 17 show that, during the period of the study, 46% of passers graduated, as did 30% of skippers and 28% of takers. Based on the results of the regression comparisons of treatment options shown in Table 16, at the .05 level of confidence, takers ($n = 74$) were no more likely to graduate than skippers ($n = 53$) ($\chi^2 = .049, p = .825, \exp(\beta) = .916$). For the passers, the results display a significantly greater likelihood of graduating when compared to takers ($\chi^2 = 4.145, p = .042, \exp(\beta) = .492$).

Many studies have used only developmental students who had passed their developmental courses for comparisons with a control group of non-developmental students (Parker, 2009). This implicit screening process, which pits proven developmental education “winners” against an unfiltered sample of non-developmental students, has the potential to bias outcomes in favor of the developmental group. In this study, therefore, a second regression analysis of key variables was undertaken to replicate this common practice. As shown by the results in Table 18, a regression analysis of the history grades of skippers ($n = 38$) and the takers ($n = 42$) who passed the reading course—designated takers-P—the results again revealed no statistically significant difference ($\chi^2 = .001, p = .971$). On the other hand, takers-FW—the ten Hispanic males

who either failed or withdrew from the reading course—did not perform as well in history. Results of a logistic regression analysis comparing takers-P to takers-FW showed a significant difference ($p < .05$) in their history grades ($\chi^2 = 7.489, p = .006$).

Table 18

Academic Outcomes for Hispanic Male Skippers and Takers-P

Variable	χ^2 value	p	Odds Ratio
History grade	.001	.971	
Accumulated credit hours	.282	.595	
Graduation*	.012	.912	1.046

*Binary logistic regression

As Table 18 shows, regression analysis of accumulated credit hours for skippers ($n = 53$) and takers-P ($n = 61$) did not indicate statistically significant differences in the number of college-level credit hours earned by the two groups. A further examination of graduation rates, using binary logistic regression to compare only the takers-P with skippers also appears in Table 18. This analysis also failed to appreciably alter the outcome; Hispanic males who enrolled in and passed developmental reading ($n = 61$) were no more likely to graduate than those who skipped developmental reading ($n = 53$) ($\chi^2 = .012, p = .912, \exp(\beta) = 1.046$).

Model Fit

This investigation of developmental reading for Hispanic males in a four year university program examined the relationship between three independent variables describing the students' need for and participation in developmental reading and seven dependent variables chosen as indicators of students' academic success. Linear and logistic regression analyses conducted with SPSS software were used to measure the

relationships of the dependent and independent variables. SPSS provides an omnibus test comparing the results of each analysis to the intercept only model, which may be used to determine the model fit. Table 19 shows omnibus test results comparing the fitted model against the intercept-only model for each of the dependent variables for passers, skippers, and takers.

Table 19

Omnibus Test Results

	Likelihood ratio χ^2	df	<i>p</i>
History grade	5.674	2	.059
Second semester enrollment	.897	2	.639
Second semester GPA	3.167	2	.205
Fourth semester enrollment	.899	2	.638
Fourth semester GPA	8.519	2	.014
Accumulated credit hours	8.708	2	.013
Graduation	4.917	2	.086

Table 19 shows that, using $p < .05$, the model is a good fit for predicting the history grade, second semester enrollment, second semester GPA, fourth semester enrollment, or graduation.

Summary

This chapter looked at the effects of moderating variables on seven measures of academic achievement for Hispanic males who had failed the Texas Success Initiative standard for reading. By all of the seven measures, results of regression analyses comparing those who skipped developmental reading with those who enrolled for developmental reading showed no significant differences between the groups. Students who satisfied the TSI standard and were not advised to take developmental reading

(passers) performed better on every measure than students who had not satisfied the TSI standard, regardless of whether the latter took or skipped the recommended developmental reading course. Developmental reading for Hispanic males appeared to have no effect on performance in the reading intensive content-area class (history), second semester or fourth semester enrollment, second or fourth-semester GPA, accumulated credit hours earned or graduation rates.

CHAPTER V

Discussion

While developmental reading has been widely used to equip underprepared students with the skills needed for college success, past research has been equivocal about whether developmental reading achieves this basic goal. The ramifications for Hispanic males loom large because they are a rapidly growing part of the US college-age population and are disproportionately channeled into developmental reading. This study sought to determine whether taking a developmental reading course improved the academic outcomes for underprepared male Hispanic students in a 4-year university program.

Review of the Research Study

This study aimed to establish whether a specific developmental reading program at a large, public 4-year university in Texas contributed to college success for Hispanic males. Data over a ten year period for students enrolled at the university were examined to identify Hispanic males who had either met the state's reading proficiency requirement (referred to as the TSI) for entering college students or had failed to satisfy the requirement. The students were classified as having passed the TSI (passers), failed the TSI but skipped the developmental reading course (skippers), or failed the TSI and taken the developmental reading course (takers). In order to answer specific questions about the outcomes of students who passed versus those who failed the developmental reading

course, the study occasionally broke the takers group into two categories, developmental reading passers (takers-P) and those in the course who earned a grade of either F or W (takers-FW).

To control for exogenous variables that have been identified in other studies as bearing on academic success, the skippers and takers were compared on key demographic markers: family gross income, mother's and father's education, high school GPA, SAT verbal and ACT English scores, high school rank, and TSI scores.

The students' subsequent success was measured by seven variables: the grade earned in history (a reading intensive gatekeeper course), second semester enrollment and second semester GPA, fourth semester enrollment and fourth semester GPA, cumulative college-level credit hours earned before leaving the university, and whether or not the student graduated.

Logistic regression analyses were applied to the data to identify relationships between participation in developmental reading and later academic success.

Review of the Literature Findings

A review of the literature was undertaken to identify the factors previously found to influence academic outcomes for college students and identify the factors used to measure the effects of developmental reading for students who arrive at college academically underprepared. Two traits—gender and race or ethnicity—have been shown to have a substantial effect on post-secondary achievement (e.g., Miller, 2007; Planty et al., 2008), with males and non-Asian minorities experiencing poorer results than females or Whites and Asians. Many of the studies concerning minority students underscored the diversity within groups sharing such capacious labels as “Asian” or

“Hispanic,” and cautioned against overgeneralization (e.g., Leinbach & Bailey, 2006; Lowell & Suro, 2002; Ramirez, 2005; Srinivasan, 2001).

Socio-economic status and parents’ education levels have also been cited as important in explaining academic success. Adelman (2004), for instance, determined that in some instances, race and ethnicity became statistically insignificant predictors of academic achievement once socio-economic status was accounted for. Parents’ education levels have also been associated with students’ aspirations for college and eventual success (Hahs-Vaughn, 2004; Horn & Nevill, 2006).

Numerous other reports described a third set of pre-collegiate variables correlated with post-secondary outcomes. These variables included high school GPA, SAT or ACT scores, and high school rank (Adelman, 2006; Cerna et al., 2009; McPherson, Bowen, & Chingos, 2009).

The measures of academic success for developmental reading students most often referred to in the literature and most pertinent to the research question were: performance in subsequent reading-intensive academic courses, second semester enrollment, second semester GPA, second year (fourth semester) enrollment, second year GPA, accumulated credit hours, and graduation rates.

Though developmental education’s premise is that additional instruction improves academic performance in later classes, repeated investigations have found that developmental reading’s effects on gatekeeper grades are inconsequential (e.g., Bahr, 2010; Calcagno & Long, 2008; Martorell & McFarlin, 2007). Second semester and second year performance have also been used as measures of developmental education’s effectiveness. Lesik (2007) found second semester enrollments to be higher for

developmental students than for a control group. Enrollment and GPA benchmarks in the second year appeared in a national study by Adelman (2004), who subsequently concluded that developmental work yielded no benefits, but neither did it impede academic progress.

If developmental reading supports students in their future college-level credit classes, then developmental reading students should accumulate more college-level credits than they otherwise would have. Researchers who have adopted this measure of success, however, have found that total credits grow only if developmental courses are included in the calculation; the number of college-level credits earned does not change as a result of developmental coursework (Adelman, 2004; Calcagno & Long, 2008).

The failure of developmental education to increase the number of college-level credits earned implies that developmental education also fails to increase the graduation rate of developmental students. Indeed, large, state-wide studies of developmental students in community colleges in Florida (Calcagno & Long, 2008), Virginia (Roksa et al., 2009), and across the range of two- and four-year public post-secondary schools in Texas (Martorell & McFarlin, 2007) and Tennessee (Boatman & Long, 2010) found no difference in degree completion rates for developmental reading students. Others, though (Bettinger & Long, 2005a), have written that developmental English and math do improve graduation rates.

Collectively, the body of evidence assessing developmental education is discouraging. Yet, if Adelman (2004) is correct that developmental courses as a whole neither help nor hinder, the likelihood remains that “above average” programs or methods

exist, or that, as Swail, Cabrera, Lee, and Williams (2005b) and Boatman and Long (2010) suggest, the effects are greater for some populations than others.

Research methods came under scrutiny in the literature review as well.

Developmental education has been characterized by poor quality research for decades (Moss & Yeaton, 2006; Torgerson et al., 2004). Among the flaws most commonly cited have been inadequate controls for sample bias and the not unrelated issue of small, idiosyncratic populations and programs. A substantial amount of research within the past decade has taken these issues to heart and studied very large populations using more sophisticated statistical methods, foremost among them being quasi-experimental methods that effectively control for sample bias. A related criticism of developmental education research is that placement tests and procedures do not accurately identify students who need and can benefit from developmental coursework (Hughes & Scott-Clayton, 2011), thereby depreciating the value of both the courses and any studies based on them.

Discussion of Results

Numerous studies have found that, where students have the option of not enrolling in developmental coursework, as many as two thirds choose to not take the developmental classes for which they have been recommended (e.g., Bailey, 2009; Roksa et al., 2009). This pattern appeared also among the Hispanic males at Generic University, where 74 who were recommended for developmental reading followed through and enrolled in the course, while 53 (41.7%) did not. This disinterest among Hispanic males was not typical of Generic students, however.

Instead, for Generic University students as a whole, the higher their gender or ethnic group's TSI passing rate, the more likely they were to avoid taking developmental reading (see Table 10). This suggests that students may have been making enrollment decisions based on reasonable cost-benefit calculations about their self-perceived need for developmental reading. If so, however, Hispanic males must have been making a different kind of calculation, because, despite ranking fourth out of six groups in passing TSI reading, they also ranked second of six in skipping the recommended developmental reading course. This study produced no evidence to explain the anomaly, but since factors such as familism (Guevara, 2007; Lopez, 2009) and commitment (Allen, 1999; Horn & Nevill, 2006) have been shown to influence developmental course enrollment specifically and college success generally, the enrollment discrepancy for Hispanic males is notable.

Question one asked how well moderating variables—placement and enrollment in developmental reading (takers), placement but no enrollment in developmental reading (skippers), and not placed in developmental reading (passers)—predict the success of Hispanic males in a 4-year university as measured by a gatekeeper grade. In this study, the chosen gatekeeper course was history, an introductory level course designated by the university as reading intensive (Generic University, 2010b) and required of all students. This choice was affirmed by the finding displayed in Table 16 that students' reading test scores correlated strongly with their history grades ($r = .268, p = .002$, significant at the .05 level, $n = 131$), indicating that reading is important for success in history. The body of prior research into the effects of developmental reading on later course success has been inconclusive, though the larger, more methodologically sound studies (Calcagno &

Long, 2008; Martorell & McFarlin, 2007; Roksa et al., 2009) found no benefits. The results of this study comport with these later findings. Hispanic males at Generic University who failed the TSI tended to perform equally well in gatekeeper history whether they enrolled in developmental reading or not ($\chi^2 = .833, p = .362$). Passers, as the TSI standards predicted, did significantly better in history ($\chi^2 = 5.692, p = .017$). Referring Hispanic males to developmental reading to strengthen their performance in this gatekeeper course does not appear to be empirically justified.

Question two asked how well the three moderating variables of placement and enrollment in developmental reading, placement but no enrollment in developmental reading, and not being placed in developmental reading, predict the success of Hispanic males in a 4-year university as measured by enrollment in the 2nd semester. Some earlier research (e.g., Calcagno & Long, 2008; Lavin et al., 1981) suggested that developmental education improved persistence, however, the results in Table 16 for Hispanic males at this university showed that developmental reading did not significantly improve the student's chances of enrolling in the second semester at the .05 confidence level ($\chi^2 = .797, p = .372, \exp(\beta) = 1.762$).

Question three asked how well the moderating variables predict the success of Hispanic males in a 4-year university as measured by second semester GPA. Other studies (e.g., Leake & Lesik, 2007) have used the first year / second semester GPA to evaluate the effects of developmental education. As shown in Table 16, second semester GPA for skippers and takers was not significantly different ($\chi^2 = 2.285, p = .131$), nor were passers significantly different from takers ($\chi^2 = 2.301, p = .129$).

GPA's for skippers in the second semester and thereafter, shown in Figure 2, generally struck a middle course between the average GPA's of passers and takers, though the differences were statistically insignificant. These findings suggest that developmental reading courses offer no particular benefits for improving the GPA's of underprepared Hispanic males over the short term. Whatever benefits may be derived from developmental reading are, apparently, just as readily acquired while taking other courses.

Question four asked how well moderating variables (placement and enrollment in developmental reading, placement but no enrollment in developmental reading, not placed in developmental reading) predict the success of Hispanic males in a 4-year university as measured by enrollment in the 2nd year. In this study, enrollment in the 4th semester was chosen as the relevant measure of persistence because it allows useful comparisons with both end-of-first-year enrollment and second year cumulative GPA. As with the findings for second semester enrollment, the probability of enrolling in the fourth term was not significantly greater for Hispanic male takers than for similar Hispanic male skippers ($\chi^2 = .832, p = .362, \exp(\beta) = 1.450$).

While enrollments for the second and fourth semesters do not appear to be statistically significant, the separation in Figure 1 between enrollments for takers-FW and all other groups, including skippers, is nevertheless provocative. That takers-FW would drop out before passers or takers-P is to be expected, but nothing suggests that takers-FW should drop out in greater proportions than skippers. As noted above, the small sample size precludes statistically valid conclusions, but the discrepancy revives the possibility that persistence may be due to cognitive ability, motivation, values, support, socialization

into the college environment, or other factors not visible in the data. This, if true, adds credence to the earlier argument (Deil-Amen & Rosenbaum, 2002) that, regardless of intent, developmental education's primary effect is to sift winners from losers.

This examination of enrollments across semesters also helps answer another question about takers-FW. Previously in this study, a description of these students held out the possibility that they had earned their F or W grade by having re-taken the TSI and passed the reading portion, then quitting the class because it was no longer required of them. Figure 1 is evidence that these students did not get their grades by having satisfied TSI requirements and that the grades fairly represented their academic performance. A second piece of evidence that takers-FW did not fail or withdraw after meeting TSI standards is found in the previous description of results for question seven. In those results, takers-FW ($n = 10$) were found to be significantly ($p < .05$) less likely to do well in history than either takers-P ($\chi^2 = 7.489, p = .006, n=42$) or skippers ($\chi^2 = 7.465, p = .006, n = 38$).

The difference in outcomes between second semester enrollments and fourth semester enrollments in Figure 1 shows that the percent of skippers enrolling dropped quickly through the 4th semester. Afterward, however, skippers remained in school as long as the takers. At least two possible explanations present themselves. One is that the first two years may have winnowed the skippers so thoroughly that those remaining were exceptionally talented, motivated, or fortunate in some regard. Second, as Calcagno and Long (2008) and Bettinger and Long (2004) suggested, it is also possible that developmental reading merely protracted the winnowing process for some developmental reading students. Though the number of takers-FW ($n = 13$) is too small to draw

statistically valid conclusions, this explanation is supported by other findings concerning the number of credits students accumulated, discussed in question six, following.

Finally, Figure 1 also shows that passers experienced greater persistence across all 12 semesters. The results for question four, then, indicate that Hispanic males do not benefit from developmental reading over the short-term as measured by their persistence through the second semester.

Question five asked how well moderating variables (placement and enrollment in developmental reading, placement but no enrollment in developmental reading, not placed in developmental reading) predict the success of Hispanic males in a 4-year university as measured by second year ending GPA. As in other studies (e.g., Attewell et al., 2006; Martorell & McFarlin, 2007), this inquiry found no significant differences in the GPAs of the skippers and takers ($\chi^2 = 2.773, p = .096$). Such differences as did appear showed skippers to have higher GPAs than takers (Figure 2). Again, passers produced significantly better GPAs than those who did not pass the TSI ($\chi^2 = 8.688, p = .003$). Developmental reading, therefore, did not appear to benefit Hispanic males as measured by GPA accumulated over this longer period of time.

Question six asked how well moderating variables predict success for Hispanic males in a 4-year university when measured by accumulated credits at the end of enrollment at the university. Jenkins, Jaggars, and Roksa (2009) found that developmental reading students left Virginia's community colleges with no more college credit hours than students who did not take the course, paralleling findings by Calcagno and Long (2008) in Florida regarding developmental math. A similar pattern appears in this study, which shows that Hispanic male students who took developmental reading

were unlikely to accumulate any more credits before leaving the university than their peers who skipped developmental reading ($\chi^2 = .059, p = .808$). Students may have extended their tenure at the university by repeating developmental reading or enrolling in developmental classes for English, math, or both (see Table 12), but whether the direct financial and indirect opportunity costs to Hispanic male students are justified by extending the time they remain in school without earning additional credits is a question that should concern developmental educators.

Question seven asked how well moderating variables (placement and enrollment in developmental reading, placement but no enrollment in developmental reading, not placed in developmental reading) predict the success of Hispanic males in a 4-year university as measured by graduation. Developmental education is often promoted as a tool to increase degree completion (Carnevale & Desrochers, 2004; McClenny, 2004; Phipps, 1998), but multiple studies have failed to detect gains in graduation rates for developmental education students (Adelman, 2006; Attewell et al., 2006; Calcagno & Long, 2008; Crews & Aragon, 2007; Martorell & McFarlin, 2007; Miller, 2007; Roksa et al., 2009). A similar outcome marked this study; no gains in graduation rates were evident for Hispanic males participating in this developmental reading program ($\chi^2 = .592, p = .442, \exp(\beta) = .744$). As expected, passers did demonstrate a significantly greater graduation rate than either skippers or takers ($\chi^2 = 5.757, p = .016, \exp(\beta) = .380$).

In short, of the seven measures of success used to evaluate the efficacy of developmental reading for Hispanic males, none returned results that were both positive

and significant. In this setting, developmental reading was not found to benefit Hispanic males.

Implications for Future Research

The literature review describes the problem developmental education studies have with controlling for bias in the non-random samples that many studies use. The review further describes the advantages of quasi-experimental methods such as regression discontinuity and matched pair studies in accounting for this bias. Unfortunately, the population available at Generic University was too small for either regression discontinuity or matched pair studies, and future investigations of developmental education with larger populations of ethnic minorities would benefit from exploiting such quasi-experimental methods. Such studies would also enable analyses revealing the potential influence of factors not visible to less sensitive methods. One method of increasing the sample size for future studies of this population would be to include students who did not take the TASP or THEA state-designed exam, but whose SAT verbal, ACT English or other alternative test scores identified them as needing developmental reading.

Additional exploration of the differences between passers skippers and takers could clarify ambiguities in the classifications used for these categories. Students who initially failed to meet TSI standards but re-took and passed the placement test within a few weeks of enrolling may have been “false” skippers – students who had the requisite reading skills but, whether for lack of motivation, testing fatigue, or other reasons performed below their true abilities. A more refined assessment of “true” skippers and passers could relieve the uncertainty surrounding these categories.

In the course of this investigation, it was noted that Hispanic males were especially likely to avoid taking recommended developmental reading courses despite having been assessed as being among those most in need. This finding was one of the strongest to come out of this study. Qualitative investigations of this phenomenon and comparisons with the choices of Hispanic males at other institutions are beyond the scope of this study, but could be especially beneficial in understanding the decision-making process and how to deliver educational services to this population.

Because the focus of this study was on Hispanic males at a large public university, additional examinations of developmental reading student performance in community colleges, studies that address women, other ethnicities, or non-traditional students would fill remaining gaps in the literature.

Instructional methods or content may be the critical variable for developmental reading outcomes, as suggested by Bailey, Jeong and Cho (2008) and others (e.g., Hodges et al., 2001; Maxwell, 1998; Rey & Karstadt, 2006; Roueche & Roueche, 1999; Rutschow & Schneider, 2011) who have associated successful outcomes with specific instructional methods and content integrated with mainstream classes. Studies which compare the efficacy of different content and instructional methods specifically for Hispanic males could help resolve uncertainty around this issue.

Limitations of the Study

Chapter two of this study, the literature review, observed that research in developmental education has been inconclusive in part because the studies have been small and methodologically weak. The small sample size for this study opens this dissertation to the same criticism. In particular, small sample sizes create difficulties in

defining a truly randomized control group for which exogenous factors such as motivation can be accounted. Although this study chose to look only at students identified by the TASP as needing developmental reading, had it included students placed in developmental reading due to low SAT verbal or ACT English test scores, the sample population would have increased. Efforts were also made to affirm the demographic similarity of the groups examined in this study, but duplicating the study with a larger population would allow the use of the quasi-experimental methods described earlier that better account for potential sample bias.

The regression methodology employed in this study has limitations that should inform any interpretation of the results. Most importantly, this method yields correlations, but since correlations do not prove causation, the findings must be understood as indicative rather than conclusive. As with most statistical analyses, regression unrealistically assumes that variables are either measured without error, or that the sources of error are random and therefore wash out. In fact, errors are often systematic and undermine result validity. The data available to this study may, in fact, illustrate the problem. For demographic data the university depended heavily on voluntary reports from students and their families. Race, ethnicity, and gender were consistently included, but records for family gross income and parents' level of education, for instance, went missing for more than half of students. Such voids in the record may have skewed outcomes for some of the demographic variables.

This study also assumed that the placement tests used by the state of Texas and the university accurately and consistently measure reading proficiency. This assumption has been accepted by other researchers (e. g., Boylan & Saxon, 2005; Caverly et al.,

2004; Martorell & McFarlin, 2007; Miller, 2007), but has also been sharply challenged (Hughes & Scott-Clayton, 2011). Not only may test designs, procedures, and interpretations be awry, but uneven student preparation and motivation could frustrate assessment quality. If testing and procedures are indeed flawed, the sample used by this study and the results derived from examining it may be invalid.

Related to the possible faults in the placement tests are the criteria adopted by this study to determine which students were passers, skippers and takers. Some students who were counted as skippers failed the TSI, but re-took the test within a month or two after enrolling at the university. The fact that these students fulfilled the TSI requirement within weeks of enrolling suggests that they were more like passers than other students whom the TASP accurately identified as needing developmental reading. Counting these students as passers could have had a substantial effect on the results.

Generic University is a moderately-difficult, selective, 4-year university, therefore the students admitted have already been academically successful and may produce results different from students with less academically successful pasts or who attend 2-year institutions. Since about 80% of developmental education students in Texas attend community colleges, the population from which this sample was drawn may well be unrepresentative of students in 2-year institutions and 4-year institutions that are less selective.

A variety of other factors also limits the generalizability of this study to other institutions. Admissions and testing standards at the university have become incrementally more stringent during the period studied and may have skewed results. Since the study is limited to Hispanic males in a particular developmental reading course,

results may not apply to the experiences of non-Hispanics, women, or developmental courses in other subject areas or using different instructional methods.

Conclusion

Developmental education, and developmental reading specifically, have long histories, but many questions linger regarding their ability to improve student outcomes. The research to answer these questions has been criticized for being methodologically weak and contradictory in its results. Research has also been negligent of males and of ethnic minorities despite the fact that they are disproportionately represented in developmental reading classes, and even among the studies of minority students, Hispanic males have been virtually ignored.

This study sought to help redress that shortcoming in the literature. The study explored whether a developmental reading program at a large, four-year public university in Texas improved the academic success of Hispanic male students as measured by seven variables: grades earned in a reading intensive gatekeeper history course, by second semester enrollment and GPA, by fourth semester enrollment and GPA, by accumulated credit hours, and by graduation.

The results showed no statistically significant benefits from developmental reading for the Hispanic male students studied. The fact that no benefits were seen in second or fourth semester enrollment, the number of credit hours accumulated, or in graduation rates suggests that, as others have observed (e.g., Calcagno, 2007; Crews & Aragon, 2007), developmental education may postpone a student's departure without adding substantially to their learning. On the other hand, the study revealed areas of uncertainty in how students are identified as needing developmental reading and how

they are subsequently classified. The results of the study should be weighed with these uncertainties in mind.

Future studies into the motivations and decision-making processes of Hispanic males who skip developmental reading are warranted by findings in this study which showed Hispanic males to skip developmental reading more than others with comparable reading needs. Additional studies with larger samples and more discerning statistical methods are needed in order to confirm both the utility of developmental reading and its utility for sub-populations who arrive with diverse backgrounds and present diverse needs in the classroom. Given the gravity and magnitude of the problems for which developmental reading is prescribed, greater attention to the needs of Hispanic males in the college setting is warranted.

APPENDIX

Reading 1300 - Reading Improvement Fall, 1992

Instructor: XXXXXXXXXXXX Hours: MF 10:00 - 11:00
 W 2:00 - 3:30 5:00 - 6:30

Office: xxxxxxxx Phone: 245-2359

Course description: This course is designed to expand your ability to learn at the college level through effective and efficient reading strategies. As a by-product, you will also be able to perform well on standardized tests such as the T.A.S.P. Combining class lecture, collaborative groups, and individualized instruction, you will participate in a variety of activities focused on learning from textbooks. These activities will develop your approaches to before, during, and after reading strategies.

Required text: Nicholson, S., Burrell, K., Sundin-McKool, S., & Caverly, D. (1993). *Reading 1300: Laboratory manual*. San Marcos, TX: Ginny's.

Course requirements:

1. Completion of 4 laboratory exercises worth 5 points each.
2. Completion of 4 unit journals worth 5 points each.
3. Completion of 13 weeks of "sustained silent readings" worth a total of 12 points.
4. Completion of midterm and (optional) final exams worth 10 points each.
5. Completion of a pretest/survey and a posttest/survey worth 10 points each.
6. Attendance and participation worth 8 points.
7. **No late assignments will be accepted.**

Grading scale:

- Credit (CR) - A grade of Credit will be granted to students earning 70 - 100 points.
- Progress (P) - A grade of Progress will be granted to students earning 60 - 69 points (i.e., indicative of having made progress, but having failed to meet minimum requirements).
- Failing (F) - A grade of F will be granted to students who earn 59 points or less through excessive absences and/or failure to meet minimum requirements. **This grade will count on your G.P.A.**

Attendance policy:

In order to receive a grade of Credit (CR) or Progress (P) in RDG 1300, students may miss no more than 9 classes. This includes lab hours and repeated tardies. There are **no excused absences**. Missing any more than this minimum number of classes will result in an automatic Failing (F) grade and may result in your being withdrawn from the university.

Tentative Schedule of Topics and Assignments (assignments are in bold print)

Unit One: Plan for self awareness

- Week One:* Introduction, Journaling on computers, Pretest
Journal 1, Pretest/Survey
- Week Two:* Evaluating task demands, Evaluating background knowledge, Choosing appropriate study strategies
Lab 1: Part A, Journal 1, SSR 1
- Week Three:* Before-reading procedures for engaging, assessing, and building background knowledge, Previewing/Predicting, Locating
Lab 1: Part B, Journal 1, SSR 2

Unit Two: Plan for text awareness

- Week Four:* Before-reading procedures for engaging, assessing, and building background knowledge, Previewing/Predicting, Mapping a chapter, Locating
Lab 2: Part A, Journal 2, SSR 3
- Week Five:* During-reading procedures for comprehending, Text marking
Journal 2, SSR 4
TASP exam - Feb. 20
- Week Six:* During-reading procedures for comprehending, Adding to maps
Lab 2: Part B, Journal 2, SSR 5

Unit Three: Plan for performance awareness

Week Seven: After-reading procedures for recognition, Noting what you know on maps

Lab 3: Part A, Journal 3, SSR 6

Week Eight: After-reading procedures for recall, Summarizing

Lab 3: Part B, Journal 3, SSR 7, Midterm exam

Spring Break - Mar. 15 - 19

Unit Four: Plan for task awareness

Week Nine: Procedures for critically reading expository text
Journal 4, SSR 8

Week Ten: Procedures for critically reading expository text
Journal 4, SSR 9

Week Eleven: Procedures for critically reading expository text
Lab 4: Part A, Journal 4, SSR 10

Week Twelve: Procedures for critically reading narrative text
Journal 4, SSR 11
TASP exam, Apr. 24

Week Thirteen: Procedures for critically reading narrative text
Journal 4, SSR 12

Week Fourteen: Procedures for critically reading narrative text
Lab 4: Part B, Journal 4, SSR 13

Week Fifteen: **Posttest/Survey**

Final examination: The final exam is optional for those students who have accumulated enough points to earn a CR. All other students will have to schedule a final exam time during the week of May 3 - 7.

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