

## ABSTRACT

Graduation Rates, Success and High School Quality

Cassidy J. Cooper, Ph.D.

Dissertation Chairperson: F. Carson Mencken, Ph.D.

The efficacy of high school grades in retention modeling has been criticized as ineffective, owing to the diversity in both grading standards in high schools and competitiveness of high school curriculums. Informed by theories from status attainment, credentialism, and cultural capital, the present study aims to create a standard with which to test both the efficacy of G.P.A. as a predictive variable, and the relationship that individual student characteristics have to the institution from which they graduate. Using student retention data from Baylor University and high school level institutional data from the Texas Education Agency, I assess the individual and institutional level factors influencing student success in college.

Student success is operationalized as college G.P.A., four year graduation, five year graduation and six year graduation. Ordinary least squares regression models, and hierarchical linear models are run to assess the relative effect of individual level variables and institutional level variables on students' undergraduate G.P.A. Binary logistic models and multinomial models are run to predict the relative effect of individual and

institutional level variables on students' four year, five year, and six year graduation rates. The results of this research support the importance of individual level variables in predicting student success. In addition to individual and institutional level variables, interaction variables are included to assess the relationship between students' high school G.P.A. and the quality of their high school. The institutional level variables were found to have random effects on predicting student success.

Graduation Rates, Success and High School Quality

by

Cassidy J. Cooper

A Dissertation

Approved by the Department of Sociology

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Charles M. Tolbert II, Ph.D., Chairperson

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Approved by the Dissertation Committee

---

F. Carson Mencken, Ph.D., Chairperson

---

Charles M. Tolbert II, Ph.D.

---

Robyn L. Driskell, Ph.D.

---

Martha G. Sherman, Ph.D.

---

Susan K. Johnsen, Ph.D.

Accepted by the Graduate School  
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J. Larry Lyon, Ph.D., Dean

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## CHAPTER ONE

### Introduction

Education holds a central place in the understanding and analysis of occupational attainment and social mobility. Educators, administrators, government officials, parents and students are invested in understanding the mechanisms behind student success in the educational environment. Predicting when and why students will drop-out, fail-out, or burn-out in higher education has become a top issue for stakeholders invested in student success, as well as the individuals and institutions that are forecasting the economic landscape and contributions of the next college cohort. Modeling student retention is employed at most institutions of higher education to predict college graduation rates for institutional prestige, institutional finances, and a means of understanding and providing student support; and is utilized at the state, and federal level to generate work-force predictions, and economic returns on student investment.

Education is one of the major structural components of society and understanding both the form and purpose of education, as an institution, has been a central part of sociology since the field's inception. Education is interdependent with other social structures such as the economy, family, religion, and politics. As each institution affects one another, the issue of availability, purpose, structure, and student success in education become key components to understanding our social structure as a whole. In the United States, education is widely available, but success in education is highly stratified. This

research will focus on three sociological theories that address how and why students, with equal access to education, succeed at different rates.

A literature review of status attainment, educational attainment and occupational attainment theories will be complemented by a review of sociological research on cultural capital, credentialism, and class legitimation. The literature paints a detailed and complex picture of how an individual's education is affected by family experiences, individual characteristics, and the interplay that those individual level characteristics have in both predicting the experience and success of one's educational endeavors.

While some debate exists over the varying effects of college degrees versus "some college" and the relative impact of school quality versus family and peer socialization, this research will focus on the impact of preparatory variables such as high school quality and family background on students' academic success and achievement in college. By combining institutional level data from TX high schools with individual level student data, I will be able tease out the relative impact of institutional quality and characteristics and the effect of an individual's personal background in their success at a single institution of higher education.

High school data was obtained from the Texas Education Agency and covers six years of institutional characteristics, student to teacher ratio, school enrollment, economic and racial demographics, as well as the number of students identified as gifted, at-risk, and suffering from financial hardships. High school institutional data is matched with three cohorts of Baylor University freshman's individual data. Collected by the university, the individual level data provides insight on the student's personal high school experience, their high school G.P.A., the number and types of AP courses they took, and

their personal, family and economic background, including their race, gender, their parent's income, their parents' educational attainment, and their success in college. The use of one university's data will allow us to eliminate the variance in university quality and culture and assess the impact that high school quality, and experience has on collegiate success.

### *Status Attainment*

Education's role on social mobility was first spelled out by Pitirm A. Sorokin in his 1927 book *Social Mobility*. Sorokin (1927) identified the educational system as a mechanism for testing, selecting and distributing individuals for and into their social positions. In many ways, the view of the educational system as a mechanism of social control, transmission and replication was in line with other scholars preceding and contemporary to Sorokin, but Sorokin's analysis of education as a significant key to social mobility was insightful and, at the time, theoretically unique. Educational institutions were seen as funneling information and knowledge into students, and only to a lesser extent, shaping their behavior (Sorokin, 1959). Sorokin began the discussion of schools as agencies that were testing students, not only on their knowledge of the material at hand, but on their talent, ability, and morality; to eliminate those whose mental and moral qualities were sub-par, and to promote the best and brightest students into fitting and desirable social positions. The intensiveness with which schools are able to perform these functions varies from society to society and from time to time; the geographic-financial allotment of educational resources, however, may create an "already selected group of children" who reach the threshold of education with family advantage and pre-selection (Sorokin, 1959).

Three decades later Talcott Parsons built on Sorokin's theme of school as the mechanism for socialization, cultural replication, indoctrination of achievement, and the disparate allocation and selection of funds. Parsons (1968) identified the way that classroom dynamics function to internalize students' commitments and capabilities for their future roles. In terms of social mobility, education is one of the keys to understanding how one's place in the social hierarchy is determined and has been an integral aspect of most models of social mobility since Sorokin's *Social Mobility*. Status attainment builds on traditional models of social mobility by viewing social mobility as a lifelong process of attainment that is influenced by an individual's parent's occupations, professional attainments, education, and social origins.

The methodological approach to status attainment as a life-long process, was introduced by Blau and Duncan (1978) who modeled status attainment and social mobility by creating a recursive structural equation model of the socioeconomic life cycle with variables such as father's educational and occupational attainment and son's education and occupational attainment. In the most basic of Blau and Duncan's models, educational attainment accounts for the majority of the effects of father's occupational attainment and father's educational attainment on son's occupational attainment. With socioeconomic background held constant, education was more influential than the individual's first job in predicting later occupational attainment and was largely independent from family background (Blau & Duncan, 1967, 1978). Blau and Duncan's basic model of social mobility is presented in figure 1 as a path diagram.

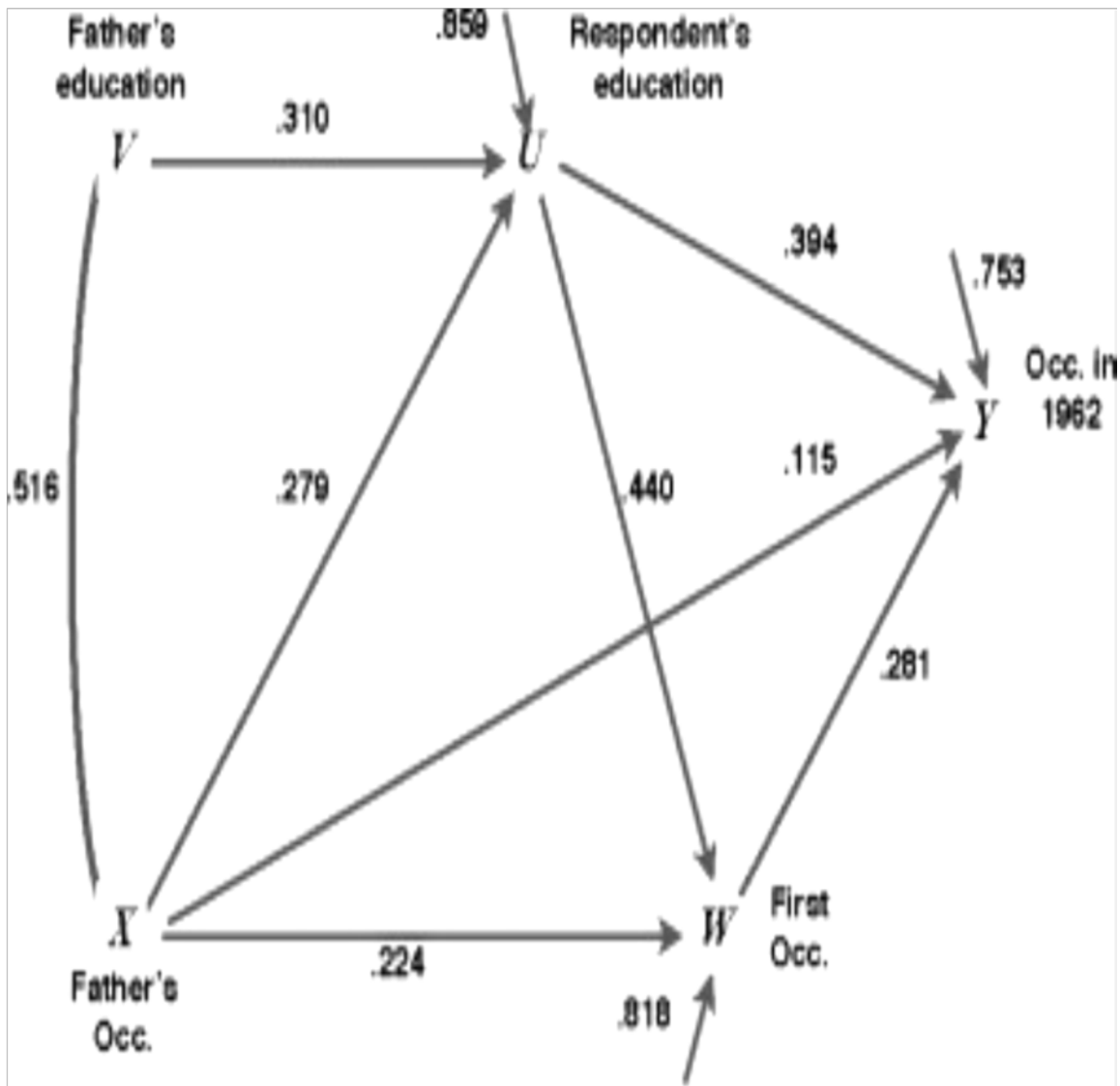


Fig. 1. Basic model of social stratification. (Blau & Duncan, 1978, p. 71)

All students enter the educational system with some level of cognitive and non-cognitive personal development, they enter the educational system with the skills and social values passed onto them from their families, and schools build on that framework with arguably differing levels of efficacy. "Schooling may be construed as an intervening process between family of origin and later occupational and economic attainments (Shea, 1976, p. 463)." The antecedents of a college education must, therefore,

include socioeconomic variables, cultural and social capital variables, and cognitive variables that students bring with them from their families, and previous educational experiences. The American dream that “anyone can go to college” is largely contingent on these antecedent variables. While any child can enter the educational system, with little educational background or family-initiated cognitive development, the same cannot be said for the collegiate environment where prior learning is essential to both entrance and success. Shea (1976) addresses the disparity between the notion that “anyone can go to college,” and the research on social mobility and education, by distinguishing between *achievement* and *attainment* or *quality* and *quantity*.

Shea (1976) asserts that the relationship between the educational quality and occupational achievement is not as strong as the relationship between educational quantity or attainment and occupational achievement. The problem with this relationship, as Shea notes, is that it is almost impossible to adequately control for the advantages that quality of school are correlated with, including higher verbal and math skills, higher SES, higher standardized test scores, etc. Attainment of an educational degree is, without argument, more important to occupational attainment and success than mere enrollment at a prestigious educational institution, but degree attainment from a high-quality institution is associated with both higher educational aspirations and higher rates of enrollment in higher levels of education (Coleman, 1961; Hauser, 1971; Shea, 1976).

Educational attainment is linked to socioeconomic status, regardless of how narrowly or broadly defined educational attainment is, or what measure of socioeconomic status is used (Sewell & Hauser, 1972). The relationship between educational attainment and socioeconomic status is a circular one with students from advantaged socioeconomic

backgrounds achieving higher educational attainment and higher levels of socioeconomic status than their low-income peers (Haveman & Wolfe, 1995; Mayer, 1997; Sewell & Hauser, 1975). Controlling for academic ability, students from high socioeconomic backgrounds have higher post-high school educational attainment than students from low socioeconomic backgrounds with a “4 to 1 advantage in attending college and a 9 to 1 advantage in graduating from college” (Jencks, 1972; Sewell & Hauser, 1972, p. 853).

While the extent to which educational attainment reflects and reproduces family economic status varies based on how the researcher operationalizes education and SES, where the sample originates from, and what subset the researcher is modeling, the relationship itself is apparent in the majority of social mobility studies in the United States and Europe (Lampard, 2007; Pfeffer, 2008). The rigidity of our class boundaries is alarming, in a society that is built upon the notion of the “American Dream,” and the assumed dominance of achieved status (Albrecht & Albrecht, 2010; Wright, 1996).

The predominant theme in status attainment literature is the importance and strength of education in predicting future occupational attainment. Jacobson and Kendrick (1973) go so far as to argue that the process of status transmission has moved from the family to the classroom, and from the workplace to the classroom. The move from workplace to classroom is a significant one in terms of occupational attainment and status transmission, as employment and promotions are increasingly being determined by certification and educational background and less by workers’ effort and performance in their workplace. Educational attainment then, from a status attainment framework, is the single most important factor in determining future success and social mobility (Berg & Gorelick, 1970). If educational attainment is the most central factor in determining one’s

place in the world, the differences between educational opportunities and experiences should be evaluated, understood, and, if possible, equalized.

Status attainment theory and modeling is the foundation for the sociological approach to social mobility, and individual success. High school degree attainment has long been a standard for status attainment research, but with the increasing economic importance of advanced degrees, the high school diploma may not be as strong an indicator of occupational attainment as it was 40 years ago. The relationship between social origins, educational attainment, and occupational attainment is a complicated one. Social origins have a direct effect on both occupational attainment and educational attainment (Blau & Duncan, 1978; Eckland, 1965) and there are differences in occupational attainment and social mobility between graduates of high prestige colleges and universities and graduates of low prestige institutions, that are independent of social origins (Ladinsky, 1967; Smigel, 1964).

Status attainment theorists in the 1960's and 70's were contesting the applicability of the "American Dream" in a society with freely available, if disparate, high school enrollment; in a changing economy, where a high school degree is no longer sufficient to achieve occupational success, and the availability of college is dependent on a host of additional social and economic factors, status attainment theory must be informed by other sociological theories and advanced to contend with the changing economic landscape (Collins, 1979).



### *Class Legitimation Theory and Credentialism*

Building on and modifying our basic view of education as a socializing agency, credentialists and legitimation theorists view the educational system through the lens of institutionalism and posit that the educational system in the United States is an allocating institution, which operates under societal rules to “confer success and failure in society quite apart from any socializing effects” (Bowles & Gintis, 1976, 2002; Collins, 1971; Meyer, 1977, p. 56). From this perspective, students and the society which they inhabit are being transformed by the educational system, its elaborate system of institutionalized rites and the awarding of specialized, authoritative knowledge.

Max Weber is the forerunner to legitimation theory and credentialism, presenting a view of class stratification and mobility that is based on societal notions of the legitimacy and superiority of the wealthy.

"In no instance does domination voluntarily limit itself to the appeal to material or affectual or ideal motives as a basis for its continuance. In addition every such system attempts to establish and to cultivate the belief in its legitimacy."(Weber, 1978, p. 213)

In the century since Weber’s posthumously published *Economy and Society*, a host of scholars have built upon his idea of how legitimacy is cultivated, and the prime focus of this research has been on education. Collins (1979) refers to rise of educational credentialism as the “Myth of Technocracy” or “educationocracy.” Educational requirements for employment have become increasingly specialized, with the increasing expectations and dependence of employers on education and the decreasing reliance on on-the-job training and performance, comes a shift in the relative importance of education for employers, employees, and our social hierarchy (Collins, 1979; Jacobson & Kendrick, 1973). The explanation for this trend towards reliance on education is typically

presented as rather straightforward: Education is tantamount to preparation for the workforce; preparation is the main determinant of occupational attainment; stratification of educational attainment is based on stratification of skills and ability; hence, education is the primary determinant of occupational preparation, skills, and success, which is progressively more important as our economy shifts towards increasingly skilled positions (Collins, 1979). The straightforwardness of this presentation is manifold in our societal interpretation of education.

If we, as researchers, assume that educational attainment is based on ability, and occupational attainment is based predominantly on educational attainment, then we begin to see what legitimation theorists are most concerned with, which is the ingrained societal belief that educational attainment, which is so highly predicated by economic advantage, is equivalent and precursory to earned success and ability. As societies begin to buy into the idea that education is ability, researchers see a shift in how societal roles are constructed and how authority is allocated (Meyer, 1977). Educational institutions have then been granted the social charter to define individuals as “graduates” and thus granting them distinct rights, capacities and privileges within society (Meyer, 1970).

Critics of legitimation theory and credentialism have argued that the majority of variance in career attainment and stratification is produced by variables other than education. Jencks et al. (1981) provides such an analysis, that accounts for approximately 40% of the variance in career attainment and argues that the remaining 60% of unexplained variance may be accounted for by chance. The 60% of unaccounted-for variance may be related to hosts of other variables that are correlated with or independent of educational attainment, but 40% of controlled variance within a social mobility model

is no small feat. The Jencks et al. (1981) *article can be used to support the conclusion that the particular school that a student attends makes little difference and that something about the process and enrollment in school itself is socializing students in terms of knowledge, social values, and status expectations.*

From this perspective school reform and the quality of educational institutions is arbitrary since so much of the benefit of education is based on the quantity of education and not on the quality of that education. In some ways, Jencks et al.'s argument provides strong evidence against the concerns of credentialists and legitimation theorists, as their argument proves that a high school degree provides an equivalent level of credentialing regardless of how competitive, advantaged or strenuous the curriculum of that institution. The primary problem with this conclusion is that the credentialing of high school graduates may be equivalent in opening up the doors for them at colleges and universities, but those presumed abilities, rights, and responsibilities are not necessarily translatable as actual ability and success in the collegiate environment.

Legitimation and credentialism are evident in our current retention modeling paradigms. Few schools, and even fewer theorists, examine the quality of the high schools from whence our populations are drawn. In most studies of success, retention, and educational attainment, a high school degree grants individuals an expected level of ability, knowledge, maturity, and cultural capital from which faculty and administrators can expect students to draw in furthering their collegiate education. The models control for a variety of status attainment, and class legitimation theories (gender, race, economic background, parents' educational background, class rank, standardized test scores and a host of other highly correlated variables) but frequently do not control for the quality of

the high schools, which while correlated to many of the traditional demographic variables, may be a stronger indicator of how they were prepared by the educational system. In many ways, this expectation of equivalent ability is built on the belief that the United States is a meritocracy that is propelled by free public education. Educational theorists have long recognized that parents and children, at every socioeconomic level presume that education is the great economic equalizer and that people “independently choose their relative class circumstances” (Johnson, 2006, p. 26).

### *Capital: Social and Cultural*

The top-heavy educational success of the wealthy, in a meritocratic-capitalist-country, has long been a debate among conflict theorists, functional theorists, and social theorists en bloc. As early as 1949, sociologists have noted that the relationship between social class and intelligence was insufficient to explain the concentration of high high-school GPAs among the upper class (A. B. Hollingshead, 1975; August B. Hollingshead, 1949). Cultural capital was first explored by French theorist Pierre Bourdieu and others, during the 1970's as they explored how education serves to reproduce existing class stratification. Althusser (1971) presented an conceptual argument that education reproduces the social relationships of production, by legitimizing the dominance of the elite. Bourdieu and his colleagues offered an empirical adaptation of class reproduction and introduced the idea of “cultural capital” as the set of predispositions and cultural ideals that children receive from their home environment and are able to capitalize on in the meritocracy that is their formal education (Bourdieu, Boltanski, & De Saint Martin, 1973; Bourdieu, Passeron, & Martin, 1996).

Bourdieu identified three fundamental forms of capital: economic, cultural and social. Economic capital is all assets that can immediately and directly be converted into money and is institutionalized in the form of property rights (Bourdieu, 1986). Economic capital, as it has long been known, plays an integral role in securing the best private and public education, and confers with it additional educational benefits in the form of tutors, and other economically dependent processes. Sociologically, researchers are able to control for economic capital in most education models by including parental income. The other two forms of capital, however, are significantly more insidious in our educational models.

Cultural capital becomes institutionalized in the form of educational qualifications, and can exist in a variety of forms including: embodied cultural capital, which is the “long-lasting dispositions of the mind and body,” objectified cultural capital appearing in the form of cultural goods such as books, musical instruments, computers, etc., and institutionalized cultural capital, which according to Bourdieu, must be set apart from the other two forms because it “confers entirely original properties on the cultural capital which it is presumed to guarantee” (Bourdieu, 1986, p. 242). All three forms of cultural capital may prove to benefit the individual in an educational setting and all three forms are best understood as exclusionary, as class-linked barriers that preclude the less privileged from advancing in education, careers, and social groups that are traditionally seen as the domain of the elite (Kingston, 2001).

Since Bourdieu and his colleagues’ original work on cultural capital, scholars have conceptualized and operationalized cultural capital in a number of ways including cultural capital as educational attainment, in-line with Bourdieu’s institutionalized view

of cultural capital (Robinson & Garnier, 1985), as economic resources (Tramonte & Willms, 2010), as knowledge of high culture (DiMaggio & Useem, 1982; Xu & Hampden-Thompson, 2012), as the culturally appropriate manner of task performance, which draws on Bourdieu's embodied cultural capital (Gouldner, 1982), as involvement in high culture events (DiMaggio & Mohr, 1985; DiMaggio & Useem, 1982; Xu & Hampden-Thompson, 2012), and as the symbols and stock concepts acquired from previous experience and associated with the economic class of the individual (Collins, 1987; Dubin, 1987).

Hollingshead (1975) has observed that there are political pressures on administrators and teachers to favor high-status students in grading, discipline and extracurricular activities, and that high-status students tend to fit the prescribed behavioral model of most schools better than their low-income peers. According to Aschaffenburg and Maas (1997), the relationship between students, teachers and cultural capital is not only related to political and social pressure on the teachers, but is due to a student's ability "to decode the implicit rules of the game...and further develop the cultural skills and preferences rewarded in schools" (p. 573). High-status students not only perform academically better in subjective assessments and high school grades, they perform better on standardized tests and have higher levels of educational attainment (Kingston, 2001). High school students vary in regards to cultural capital and higher levels of cultural capital among students is positively correlated with higher graduation rates from college (DiMaggio, 1982). DiMaggio and Mohr (1985) confirmed that cultural capital plays a significant role in higher educational attainment and an important

role in marriage by “permitting intimacy between potential mates instead of acting as a generalized medium of exchange in the marital marketplace” (p. 1252).

Opponents of cultural capital theory cite the existence of cultural and education stratified societies in communist countries, where the economic base is not capitalist and some scholars have proposed adaptations to cultural capital theory that are more culturally universal. The cultural stratification in communist countries should, at least theoretically, not be derived from the self-perpetuating cultural capitalism that Bourdieu and others posit (Collins, 1979). Critics of cultural capital theory, argue that cultural stratification is not uniquely capitalist and thus may be linked to other causal mechanisms (Collins, 1979).

Bourdieu’s original argument that cultural capital is relationally defined by the elite has also had some criticism. Evidence suggests that subordinate groups are relatively autonomous and have their own values, norms, and standards independent of the dominant class (Grignon & Passeron, 1985; Horowitz, 1983). A critical premise among scholars is whether cultural capital theory can be applied cross culturally. Bourdieu’s empirical work was focused on French society, and while the United States shares some similar economic and social features with France, the racial diversity, weak high culture traditions, high rates of social and geographic mobility, and cultural regionalism, have led to some hesitation among sociologists about the blanket applicability of traditional cultural capital theory to the American landscape (DiMaggio, 1994; Kingston, 2001; Lamont & Lareau, 1988).

The new middle class perspective argues that there are fewer class distinctions in modern Western industrialized countries because access to education and high culture

events, activities and values is not limited to elites (Bonner & du Gay, 1991). From this perspective, the advantage of cultural capital is diminishing in relative importance.

Broderick and Hubbard (2000) found no relationship between students' cultural capital and teacher's subjective assessment or grades. Roscigno and Ainsworth-Darnell (1999) found similar results when looking at cultural capital and tenth-graders' math scores, reading scores, and G.P.A.

Proponents of cultural capital theory assert that much of the quantitative research misses the subtleties, micro-politics, and social interactions that are inherent in the "conversion of cultural capital into social privilege" (Kingston, 2001, p. 96). The decontextualizing of cultural capital is an important theoretical dilemma of the survey-based research, which is most common among cultural capitalist critics. It is the context of cultural capital that is most germane to this work. Much of the literature on cultural capital provides a murky understanding of the exact causal mechanisms for conversion of cultural capital into privilege, but the argument can be made that students who decode, and demystify the academic milieu are more successful than students who do not; whether that skill set is acquired exclusively from high-status capitalist families, or from a composite of social interactions, and privileges, the hypothesis can be made that a culture exists in elite schools that provides the code-book for educational success.

Social capital is the aggregate of the potential resources of a social network. Where cultural capital helps establish an individual's connections, and place in the social hierarchy, social capital is the benefit of that membership, which entitles an individual to the collective credit or resources of the group (Bourdieu, 1986). Social capital is described by Putnam as the "features of social life-networks, norms, and trust that-enable



participants to act together more effectively to pursue shared objectives” (Putnam, 1995, pp. 664–665). Social capital can be seen as applicable at both the macro and micro levels of human society (Stone & Hughes, 2002).

At the macro level, social capital relates to democracy, economic growth and social stability and at the micro level it is related to the well being of the individual and the family and access to human and financial capital (Stone & Hughes, 2002). For students, positive networks of social trust are required for successful navigation of the educational system, and these networks are especially important for minority and underrepresented populations (Stanton-Salazar & Spina, 2003). For marginalized individuals the successful navigation of the collegiate community requires them to fit into multiple worlds, defend their self-esteem, affirm their identity within the group, make strategic use of their social networks, and, for minority women, the balance of traditional gender roles and expectations is also crucial (Padilla & Perez, 2003; Stanton-Salazar & Spina, 2003). Failure to do this puts individuals on the defensive and their long-term social development suffers (Stanton-Salazar & Spina, 2003). The development of social relationships with school personnel and teachers has positive effects for all students, but is crucial for marginalized students (Stanton-Salazar, 1997).

### *High School Inequality*

The American public education system is primarily funded by local property taxes, which results in wealthy districts spending approximately three times the per-pupil amount as low income districts (Condron & Roscigno, 2003). The exact relationship between educational funding and student outcomes is murky, but that the relationship exists, that higher spending results in a better education, has been supported (Burtless,

1996; Elliott, 1998). A number of studies have suggested that increased spending may not be the sole solution to increasing student success, but the relationship between money and achievement may have more to do with how money is allocated, and how specific resources are made available (Condrón & Roscigno, 2003; Wenglinsky, 1998).

Educational dollars are used for a variety of functions and money spent on different functions such as building maintenance versus teacher salary may impact student success and achievement differently. Funding towards physical maintenance and building conditions results in environments that are more conducive to learning but there may be diminishing return on that investment for some schools (Kozol, 1992). Condrón and Roscigno (2003) posit that it is not necessarily the physical environment of the school, but the social environment and the culture of the school that makes the most significant difference in student success. By increasing the funding for instructional purposes, schools are able to create a climate that encourages a greater sense of order, consistency and buy-in from students, faculty, and staff (Condrón & Roscigno, 2003).

Highly intelligent students are more likely to attend high status schools, resulting in an academic environment at lower status schools that is less competitive, where getting higher grades and a higher overall GPA is easier and requires less intelligence and/or less academic effort (Nelson, 1972). The interaction of academic culture and competition at high-status schools may have broader implications for students entering colleges and universities. The academic climate, academic competition and social interactions may have preparatory effects that are not accounted for by GPA or standardized test scores. When curriculum is distinctively chartered, such as college preparatory high schools,

there is an considerable difference in the expectations and aspirations of students (Alexander & Eckland, 1974).

### *Retention, Modeling, and Student Success*

Non-persisting students represent potential lost income for the university in lost tuition dollars, but they also represent a loss of community for the university. When colleges and universities invest time, money, and other assets to create a well rounded, or representative class, non-persisting students represent a loss of the social diversity and fabric of the college or university. With dropout rates higher for minority students and males, we can predict that the senior-level discussion-based courses are demographically less diverse than the large lecture courses of their first academic year. The non-persistence and non-retention of certain types of students leaves the rest of the student body devoid of those diverse voices, friendships, community and social interactions. By looking at student retention from the perspective of an educator, we are able to see students, not only as an integral part of the economic climate of the college or university, but as an integral part of the collegiate community.

Nationally, approximately one third of American undergraduate students graduate within four years (Astin & Oseguera, 2005). When we extend the time frame to five or six years, approximately 57% of students graduate with a bachelor's degree. Four year completion rates are on the decline for practically all types of students (Astin & Oseguera, 2005). Approximately one third of undergraduate bachelors-seeking students leave college before their second year and that number is higher for students at two year institutions, with close to half of associate-degree-seeking students not retaining in that timeframe (ACT, 2012). The high levels of non-persistence in degree attainment poses a

problem for educators, administrators, and government officials, all of whom are interested in seeing students succeed and utilize their educational attainment in the job force.

Astin and Oseguera's (2005) research suggests that institutional variation between universities' retention rates is largely a reflection of differences in their incoming students and not in their retention programs. Private colleges and universities and Christian college and universities have higher than expected rates of degree completion than standard formulas for assessing student retention would suggest (Astin & Oseguera, 2005). The time to degree is protracted at public universities (Astin & Oseguera, 2005).

Institutional grade performance is the strongest indicator of academic success, persistence, graduation, and future success in admission to graduate schools, professional programs and high-level occupations (Pascarella & Terenzini, 2005; Tinto, 1993). The higher a student's first year GPA the more likely that student will persist (Ishitani & Desjardins, 2002). Research suggests that many intervention programs such as remedial instruction (Easterling, Pattern, & Krile, 1995), supplemental instruction (National Center for Supplemental Instruction, 1997), first-year seminars (Fidler & Moore, 1996; Fidler, 1991), and academic advising (Seidman, 2005) are effective at increasing retention and institutional success. Typically, at-risk students are identified based on their academic performance in the first year, first semester, or certain courses specific to that time frame, but intervention and preparatory programs made prior to students' failures may be more effective. Approximately three quarters of all college dropouts leave during their first year, which makes early intervention and aid programs paramount to increasing retention (Pantages & Creedon, 1978; Tinto, 1993).

Kulik, Kulik and Shwalb (1983) found that students who are identified and subject to university administered intervention programs have a GPA improvement of .27, which is approximately equal to a letter grade improvement in a course each semester. Similar research done since Kulik, Kulik and Shwalb, has also confirmed the efficacy of intervention programs that use the individual level variables to target students for additional academic and social support, but the success of intervention programs is largely tied to the institution's ability to effectively identify at-risk students (Eno, McLaughlin, Sheldon, & Brozovsky, 1999; Kellogg Commission on the Future of State and Land Grant Universities, 1999; Pascarella & Terenzini, 2005).

The anthropological and ethnographic process by which individuals move from one social status to another was described by Arnold van Gennep and is delineated into three phases: separation, transition, and incorporation (Tinto, 1993). The application of these rites of passage to Western college students was first applied by Tinto (1993), who asserted that student retention was analogous to the process by which an individual becomes incorporated into human communities. The first stage, separation, is especially salient for college students, as they are expected to disassociate from their membership in past communities such as local high school, community organizations or clubs, local church, local area of residence, family, and friends (Elkins, Braxton, & James, 2000).

Students, whose previous affiliations and social ties are not supportive of college, are more likely to leave college early, especially if they perceive a rejection of the values of their family or friends necessary in order to embrace the new college environment (Tinto, 1993). Non-academic factors such as self-confidence, academic goals, and relationship to the college or university have been shown to have a stronger relationship

to college retention than high school GPA, or ACT scores (Lotkowski, Robbins, & Noeth, 2004). The religious nature of Baylor University may add an additional strain to students' whose families and close friends are not religious or whose religious affiliation and tradition is highly dissimilar to that of Evangelical Christians.

Failure to successfully negotiate the process of incorporation results in a student who is not integrated or incorporated into the intellectual and/or social fabric of the community, a process which is the institutional equivalent to Durkheim's concept of egotistical suicide: dropping out (Elkins et al., 2000; Tinto, 1993).

*The Holy Grail of Retention Modeling: Standardized tests, GPA,  
AP tests, and why those may not be sufficient*

Standardized testing creates a content sampling error; much like the statistical term "sampling error," content sampling error suggests that the tests are assessing a small non-random subset of knowledge, skills, and behaviors from a wide domain of abilities (Harris, Smith and Harris, 2011). Harris, Smith and Harris outline three problems associated with content sampling error, some of which are better applied and understood by looking at primary and secondary school aptitude tests, but all three can apply to our dependence on standardized testing as a means of evaluating expected student success in college. The SAT and ACT, like all standardized tests, draw certain questions in math and reading comprehension from the domain of expected knowledge, but test makers must always set arbitrary boundaries about what constitutes vocabulary versus comprehension, they must limit the test both in number of questions and thus topics, ideas, and skills demonstrated, and in timing (Harris, Smith and Harris, 2011). These limitations create errors, students who miss comprehension questions because they didn't have the prerequisite vocabulary, students who could have gotten the correct answer(s) if

they had not been rushing to finish on time, students who are simply “good test takers,” and students whose total score is lower than expected because their strengths are centered in one area. If standardized testing is flawed, and many critics suggest that they are, then researchers are left using high school GPA as a measure of student success, aptitude and expected success and retention in college, but not all schools are created equal. A 4.0 at a large, urban inner city school may not be the same as a 4.0 at a small, private, prestigious high school.

GPA scales also vary by institution with some high schools maintaining a 4.0, 5.0 or 100 point scale. Some secondary institutions inflate grades based on AP coursework or honors classes, giving students the potential to receive a 5.0 on a 4.0 scale, while other schools do not adjust GPAs based on AP or honors coursework. It becomes difficult for researchers and educators to standardize GPAs across disparate institutions. Elkins, Braxton and James (2000) found that the effect of high school achievement on persistence was statistically significant, but the magnitude of the standardized regression was low enough not to be meaningful, making the indirect effect trivial. The high school achievement’s triviality on retention may be an indicator of the variance in the American educational system. Students with similar GPAs that come from different high schools, with different curriculums, or from the same high school offering a range of rigorous courses, may find they are unequally prepared for collegiate work and collegiate preparedness has long been known to be a strong indicator of retention.

Pike and Saupe (2002) found that high school effects explained about 7% of variance in first year grade point averages. Pike and Saupe (2002) calculated high school variables including size, average ability of student, proportion of students from a high

school attending a given college, and whether the high school was private or public. Warburton, Bugarin and Nuñez (2001) found that the “academic rigor of student’s high school curriculum” was strongly associated with collegiate GPA for first-generation students (p. 2). Warburton, Bugarin and Nuñez’s (2001) “academic rigor” may be more accurately described as the extent to which students’ took advantage of academic opportunities provided to them as neither the quality nor rigor of the institution itself was controlled for in the models.

AP courses are offered in about 62% of the nation’s high schools and in many high-stakes admissions processes the presence of AP courses on a high school transcript is seen as an indicator of future success (Geiser and Santelices, 2004; National Research Council, 2002,). The presence and quantity of AP courses in a high school may “serve as indicators of the quality of the academic program offered” at the high school (Geiser and Santelices, 2004). Adelman’s (1999) composite index of high school rigor included AP courses but found that they were one of the weaker indicators of high school intensity.

Access and availability of AP tests vary by and within high schools. Poorer schools typically have fewer, if any AP courses, and disparities between students from minority and disadvantaged backgrounds (low income, first-generation college, low-performing schools, and low-income schools) have been well documented (Oakes, 1990; Oakes, Gamoran and Page, 1992). Policies vary on how AP course work is used in the admissions and enrollment process. The majority of schools have historically used AP test results to allow students to receive credit for college work, but increasingly, AP coursework is used as an admissions criterion (Geiser and Santelices, 2004). For most students, AP test results are not available until after college admission decisions are made



but the enrollment in AP courses is available on their transcripts early and is presumed to indicate how well students take advantage of the opportunities presented to them:

“Because past performance is deemed a strong indicator of student performance, admission officers carefully review applicants’ transcripts to determine how well and to what extent the applicants have taken advantage of the school and community-based opportunities available to them” (National Research Council, 2002, p. 55)

Geiser and Santelices’s (2004) research suggests that while AP test results are an excellent indicator of collegiate success, AP course enrollment may not be a better indicator of high school quality, and socio-economic advantage than it is of college preparedness. Criticism has been leveled at Geiser and Santelices’s findings, arguing that collinearity between GPA, SAT score, parental education, and number of AP courses undermine the magnitude of any statistical prediction (Camara & Michaelides, 2005). While AP enrollment is a contested issue in terms of individual expected performance, the availability and prevalence of AP courses can serve as an indicator of high school quality and rigor.

### *Attainment, Capital, Inequality and the Big Picture*

Inequality in schools, disparity in levels and types of cultural capital and parental education and occupational attainment all contribute to our understanding of how students fare in the academic landscape. Alexandria Walton Radford recently published a book that looks at why top students do not always choose to attend the top schools and, in doing so, she outlines the phases of educational choice as predisposition, preparation, exploration, application, admission, matriculation, and integration (Radford, 2013). What she finds is that in a small subset of students, in the very best students that America has to offer, college choice varies, with valedictorian students enrolling at both most-

selective schools and regular schools. The variance in enrollment has roots in the students' aspirations, their familiarity with college options, and their economic situation (Radford, 2013). High income valedictorians apply to double the number of colleges and universities as low-income valedictorians and this may be due to a type of cultural capital that is represented in their higher familiarity with a variety of institutions and geographical locations, it may also be a product of increased financial resources as each application has an associated fee (Radford, 2013).

Integration into the college environment is a key piece of understanding student success and a significant body of research exists on the anthropological and social processes that accompany student integration into higher education (Tinto, 1993). Whether students' success is measured in graduation, G.P.A. or psychological measures of happiness and satisfaction is a matter of methodology, but for this research I will focus on integration and success in college as the educational attainment of graduation and G.P.A.

The importance of college G.P.A. as a measure of student success is a hot button issue in academia (Arum & Roksa, 2010; Pattison, Grodsky, & Muller, 2013; Rojstaczer & Healy, 2012) as well as the mainstream media (see (Ghilarducci, 2010; Lewin, 2010; Shaw, 2013); academics, business leaders and politicians are arguing over whether grade inflation in colleges and universities exists, whether college G.P.A. matters, and how/ if employers can continue to use educational attainment as a substitute for on-the-job training and a proxy for applicable occupational preparation and acumen. The Texas legislature will vote in 2013 on the Honest Transcript Bill, which has been touted as a means to ensure integrity in academia by providing the median grades for all courses on

college transcripts. The bill addresses the political and capitalist fear that grade inflation may threaten the legitimation and credentialism of college education.

The relationship between parental educational attainment, parental occupational attainment, cultural capital, inequality and student success is a complicated, multi-faceted educational and sociological issue. Parents' educational and occupational attainments are highly influential in predicting students' cultural capital and high school academic environment. By combining state-level institutional data with university data this research will integrate attainment theories, with cultural capital theories and legitimation theories to understand the complex mechanisms that result in student success or failure in college.

The primary hypothesis of this research is focused on the significance of high school variables in impacting students' preparation and success in college. High school quality is inherently related, in the United States, to parental income, education, and occupational attainment, but by controlling for these variables it becomes possible to assess how, and if, the quality, academic rigor, and social capital of the high school affects students' success and retention in college.

There are three sociological arguments presented in the literature review: educational attainment, cultural capital and credentialism. Educational attainment theories and cultural capital theories lend themselves to the argument that institutional level variables are significant in shaping the individual and predicting educational success. From an educational attainment perspective, an individual's family background provides the antecedent variables that predict how well an individual will do in primary and secondary education, what kind of primary and secondary education experience they

will have, and subsequently how well they will do in higher education. Cultural capitalists enter the argument from a different side, but come up with similar conclusions about the importance of social context in developing and predicting an individual's ability, and social cache. From a credentialist perspective, the quality of the institution is of little importance. The conferral of a degree from an institution, regardless of the quality, competitiveness, or caliber, is the single most important factor in predicting future success. This research will focus on the impact that high quality and low quality schools have on granting the codebook to education as an institution; the cultural capital and cognitive abilities that are developed in the academic environment versus the affect of individual history among a population with equivalent, if not equal, credentials.

## CHAPTER TWO

### Data and Methods

#### *Sample*

The data used for this research is a combination of data from two sources: Baylor University Institutional Research and the Texas Education Agency.

Baylor University (BU) retention data from students who matriculated from the fall of 2004 to the fall of 2006 was collected from Baylor University's Institutional Research. Data on each student was updated via BU's online data warehouse, Bearhaus, which tracks all students after their entrance to the university. In 2004, Baylor had 2785 entering students. In 2005, 3168 students matriculated. In 2006, there were 2783 entering students. The Baylor sample includes information about students' family economic and educational background, students' academic performance in high school and college, as well as basic demographic variables such as gender, race and religious affiliation. Of the 8736 students who entered Baylor between 2004 and 2006, 2311 students were from out-of-state or out-of-country. Non-Texas resident students were removed from the analysis because high school institutional level data was unavailable for out of state students, leaving a sample of 6425 Texas-resident students. Texas-resident students were coded by school type as private or public. The sample includes 5315 students who attended Texas public high school. Of the 5315 students who attended Texas public schools, institutional level data for the students' high schools was available for 4634 students representing 879 Texas public high schools. Individual level analysis included students from both public

and private high schools, but institutional data was unavailable for Texas private schools so the dissertation analysis only includes the public school sample.

Texas Education Agency (TEA) Data is available through the Public Education Information Management System (PEIMS), and provides detailed, campus level information on over 1,200 Texas school districts. TEA data provides school level information about student enrollment, student-faculty ratio, student economic disadvantage, school-level student racial composition, and section-specific student pass rates for the Texas Assessment of Knowledge and Skills (TAKS) test. Texas does not provide an Academic Performance Index of public schools like California, but Texas administers a standardized test to students in grades 9-11, known as the Texas Assessment of Knowledge and Skills (TAKS). The TAKS test is a standardized test developed and scored by Pearson Educational Measurement. Passing the TAKS is a graduation requirement for Texas high school students. The TAKS test is the only data available that provides a standardized assessment of Texas public school quality.

The dataset has two levels of measurement: individual level variables, such as, gender, race, family SES; and institutional level variables, such as, TAKS test performance and commendation for the high school, racial composition, percent of gifted students, and student to faculty ratio. Status attainment theories and class legitimation theories suggest that individual level variables are of the most salience. A students' gender, race, economic situation and parental education should have a tremendous effect on how that student performs and how well they have been prepared and supported in their academic endeavors. Indeed, many of the individual level variables of income and family background are correlated with institutional level variables associated with high

school quality. It is this relationship between the individual and the institutional, combined with cultural capital theories, and the criticisms of legitimation theory, that suggest that both levels of analyses should be assessed separately and concurrently. For this research, several models will be conducted that attempt to tease out this complex relationship between family background, institutional environment, and student success in college.

### *Outcome Measures*

The study utilizes graduation, four-year graduation, five-year graduation, six-year graduation, and cumulative university G.P.A. as the indicators of collegiate “success.” Graduation is possibly the most important variable in gauging student success. A college degree, regardless of G.P.A. is a significant marker in status attainment research and represents a strong predictor in future occupational attainment and economic success. Approximately 72% of the students who enrolled from 2004-2006 graduated from Baylor. The majority of graduating students, 51%, graduate within four years. Figure 2 displays BU graduation rates by time to graduate. Approximately 28% of Baylor undergrads fail to graduate from the university, but this number may include students who finish their degree elsewhere. However it is categorized, during the 2004-2006 entering class time frame, Baylor University failed to retain 28% of students from Texas public schools.

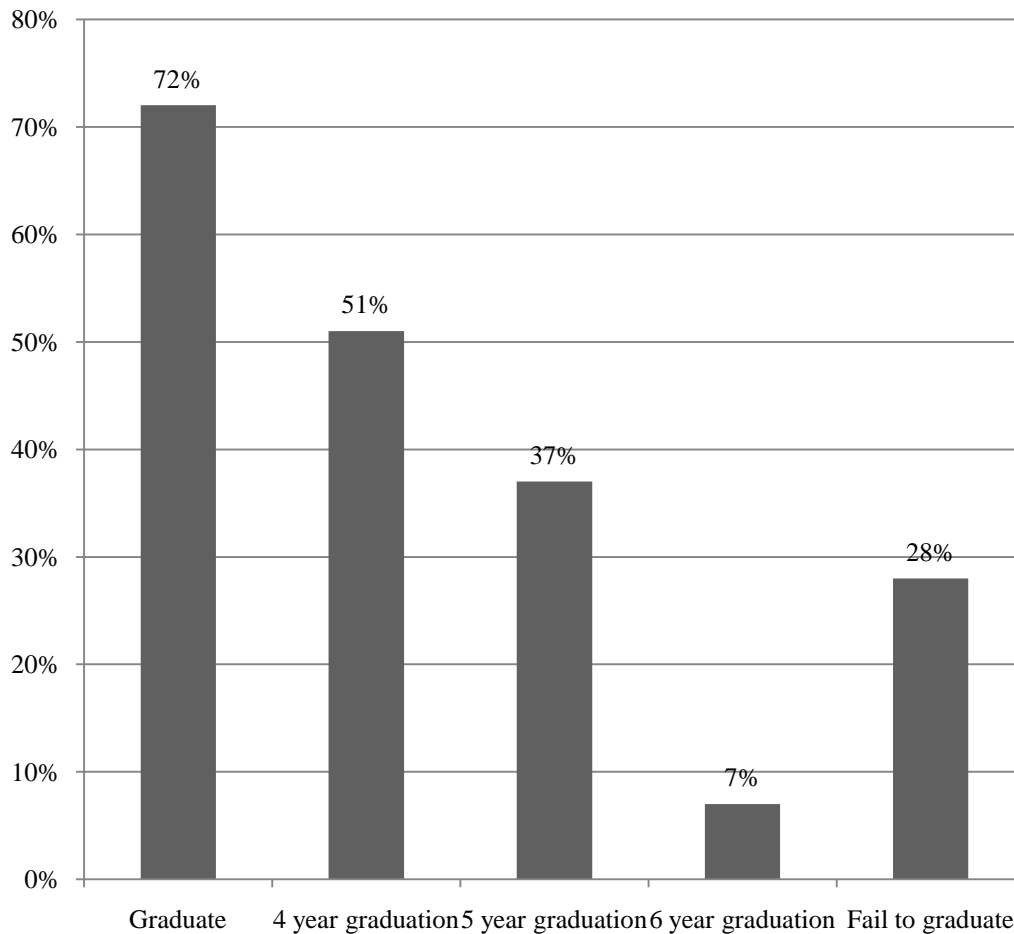


Figure 2. Undergraduate Baylor graduation rates

Undergraduate G.P.A. is also used as a measure of student success.

Undergraduate G.P.A. is a strong predictor of future educational attainment and is a key component of graduate school admissions and success. Baylor requires a 2.0 cumulative G.P.A. and 2.5 major G.P.A. to graduate. Seventy-three percent of BU undergraduates who come from Texas public schools graduate with a 3.0 or higher cumulative G.P.A. and 4% graduate with a 3.95 or higher. Figure 3 displays the range of undergraduate G.P.A.s within the sample.



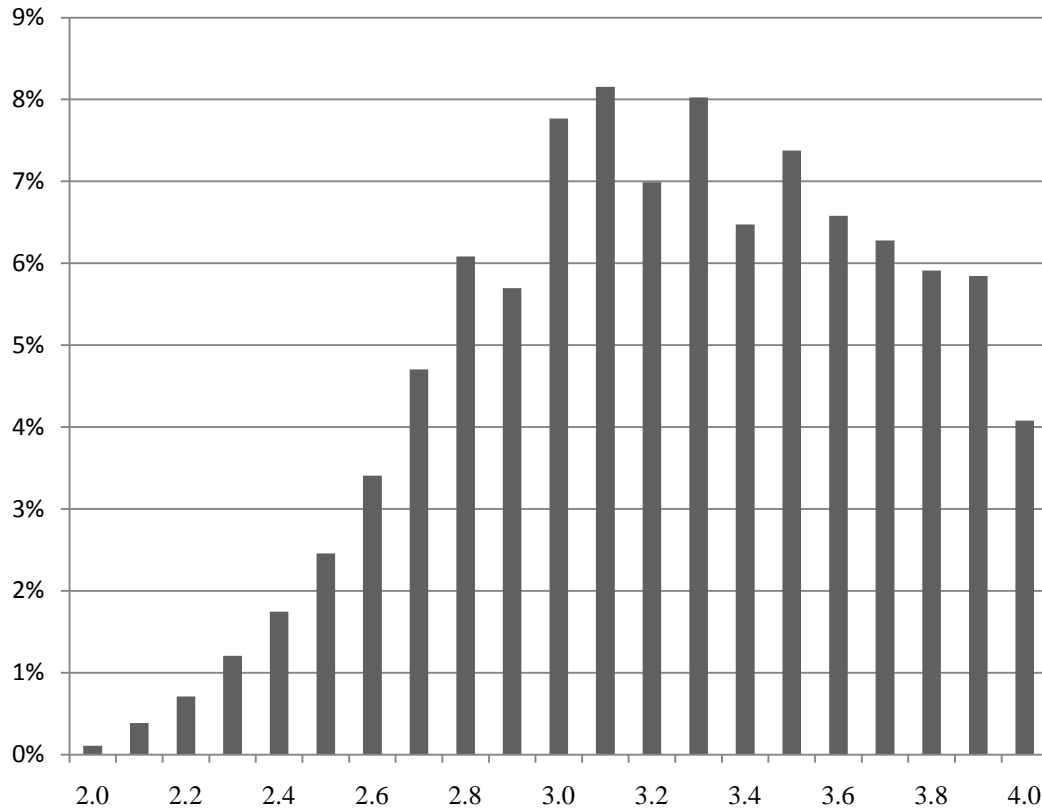


Figure 3. Students' Baylor G.P.A.

### *Predictor Variables*

Two levels of predictor variables are used. Individual level variables pertaining to the student's family and academic background were obtained from the university's student database. The individual level variables are a combination of self reported data, and information reported to the university from the student's high school, the College Board, and the IRS. Table one provides a description the individual level predictor variables that are used in the analysis.

Table 1. *Description of Individual Level Predictor Variables*

Individual level Variables	Description
Gender	Male or Female
Race	White, Asian, Hispanic or Black
Income Ordinal	An ordinal variable of combined parental income with 8 categories: (0) Income not reported, (1) Less than \$35,000 (2) \$35,000-\$50,000 (3) \$50,000-\$75,000 (4) \$75,000-\$100,000 (5) \$100,00-\$125,000 (6) \$125,000-\$150,000 (7) over \$150,000
First Generation	Dummy variable for whether or not the student would be the first in his/her family to graduate from college
SAT Total	The total SAT score is the combined math and verbal scores from the SAT
Provisional	Dummy variable for whether or not the student was conditionally accepted to the university
Enrollment Year	A control variable for what year the student matriculated into the university
GPA Percentage	The student's high school G.P.A. divided by the high school's grade point average scale
Father's Education (Binary Variable system)	The highest level of education that the student's father completed, coded as (0) unknown (1) middle school (2) high school (3) college or beyond
Mother's Education (Binary Variable system)	The highest level of education that the student's mother completed, coded as (0) unknown (1) middle school (2) high school (3) college or beyond
APCount	The total number of AP courses that the student took in high school

High school G.P.A. is traditionally one of the strongest predictors in student's college success and retention, but problems exist with G.P.A.'s that are inconsistent in their scales, inflated, and/or inconsistently weighted (Camara & Michaelides, 2005; Geiser & Santelices, 2004). In the Baylor data, G.P.A. scale was of primary concern and was highly problematic. The Admissions Office frequently uses high school G.P.A. in conjunction with high school rank, but not all high schools rank and not all high school G.P.A. scales are known. For this analysis, high school G.P.A was converted to high

school G.P.A. percentage by dividing the students' G.P.A by the known or presumed scale. High school G.P.A. scales in this sample range from 4.0 to 120, when the scale was known the high school percentage was calculated using the known scale number. When the scale was unknown, the percentage was calculated using the standard 4.0 scale. Some students were removed from the analyses that dealt with high school G.P.A., because their scale was unknown and inconsistent with the standard measures. The Texas-resident sample for whom high school percentage was calculated and included is 3023 students. In addition to high school G.P.A. percentage, the number of AP courses a student took were included as a count variable. The number of AP courses that a student took is indicative of both the student's access to college preparatory classes, as well as a proxy measure for the quality of that school's academic offerings. The standardized test score included in this analysis is the SAT total score.

In addition to the student's individual academic performance variables, the analysis includes students' socioeconomic and demographic variables, including gender, race, parents' income, parents' education, first generation college students, and whether they were provisionally accepted to the university. Provisional acceptance is based on academic variables and primarily tied to standardized test scores, but provisional students receive additional academic support from the university.

Figure 4 displays the racial composition of the sample. Approximately 70% of the sample self identify as White, 7% Asian, 12% Hispanic, 9% Black, and 2% Other.

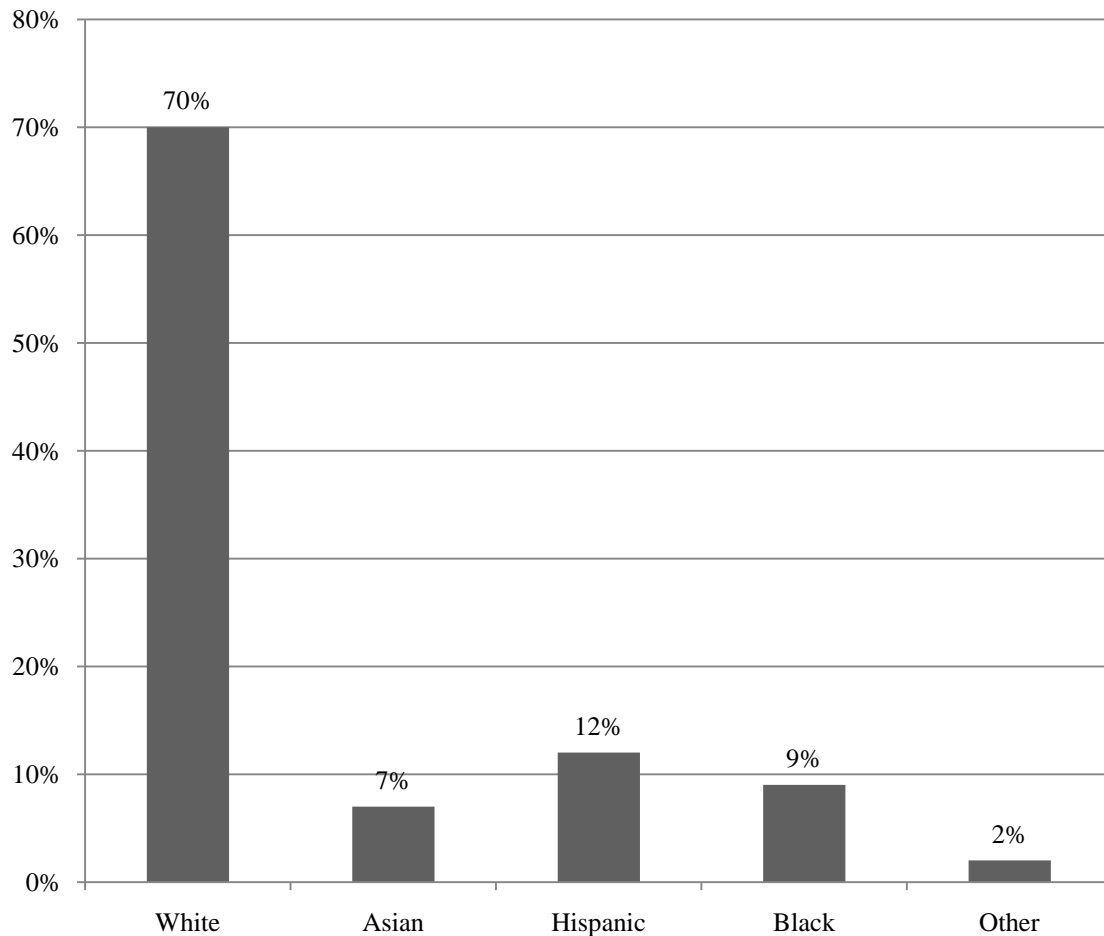


Figure 4. Race of Baylor undergraduate students

Figure 5 presents the parents' income for the sample. Income was self-reported and approximately 30% of the sample chose not to report their income. An income scale was created using the income numbers that were available. Fifteen-percent of the sample come from families making less than \$35,000 per year, making it the second largest economic category after "Income Not Reported."

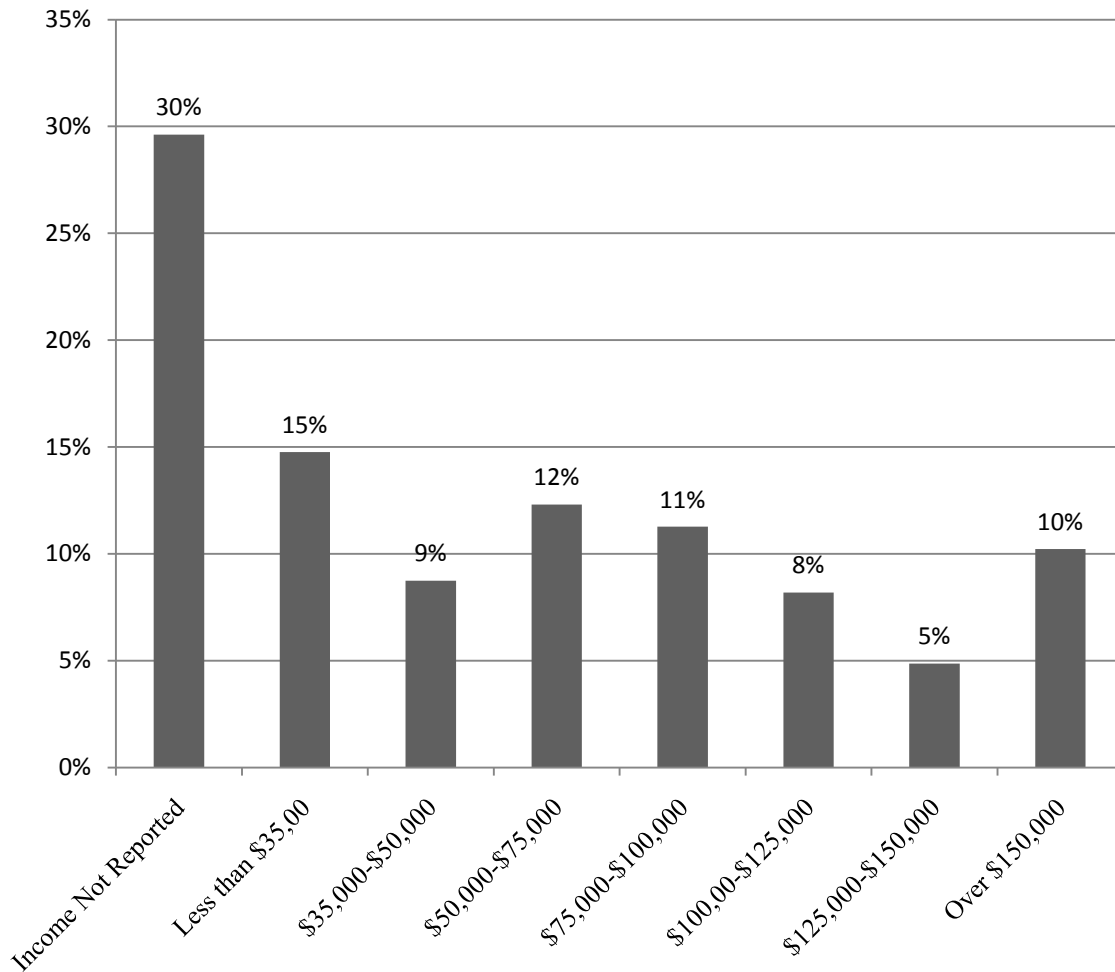


Figure 5. Parental income of Baylor students

Figure 6 presents the parent's educational attainment. Sixty-four percent of the sample had at least one parent with a college degree or beyond. Fifty-one percent of the students had two parents with a college degree or beyond. Sixteen percent of the students come from families where both parents have a high school degree and only 1% of students come from families where both parents have middle school education. Eleven percent of the sample was first generation college students, coming from families where no one in their immediate family has graduated from college. Two-thirds of the students in the sample come from a home where at least one parent has a college education, which

is remarkably high considering only about 30% of the U.S. population had a bachelor's degree or higher in 2012 (U. S. Census Bureau, 2012). Status attainment and cultural capital theories both stress the importance of the family's education in predicting student success in college, as it is an important component of understanding the motivation, guidance, support and preparation that a student may have received.

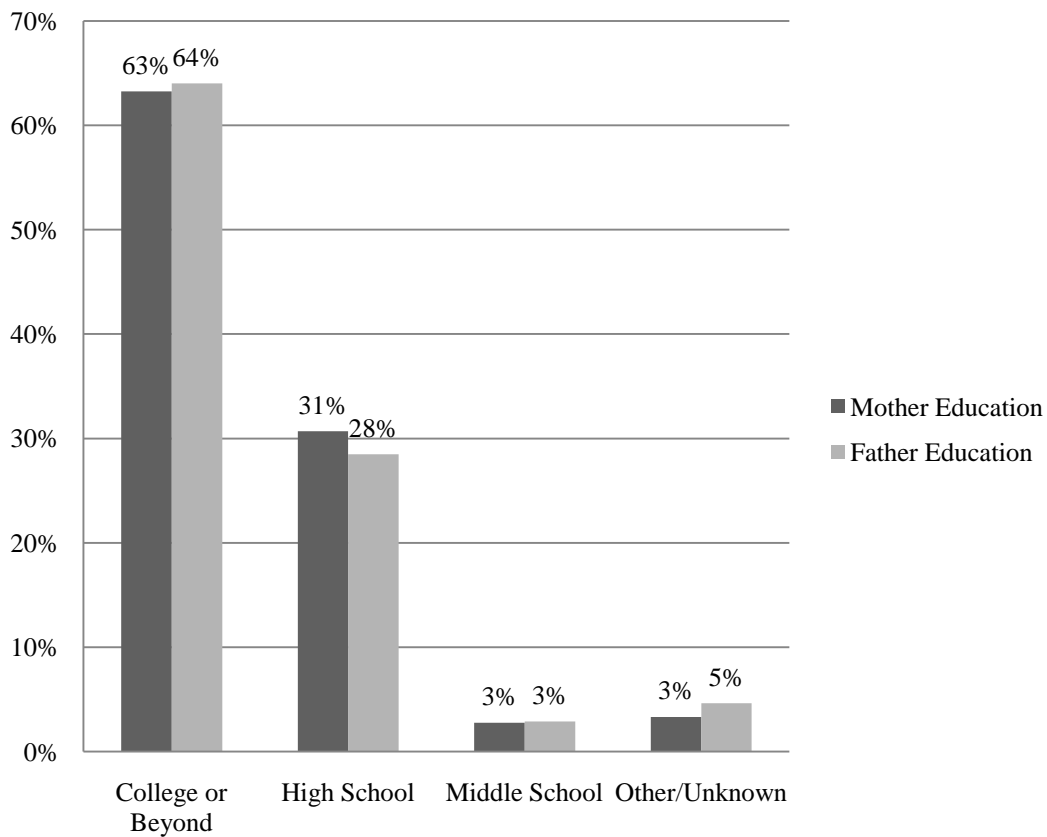


Figure 6. Education levels of parents of Baylor students

Institutional level data was obtained from the Texas Education Agency (TEA). TEA data is obtained through state-wide testing and institutional reports on student demographics, enrollment, and staffing. Table two provides a brief description of all institutional level predictor variables used in the analysis

Table 2. *Description of Institutional Level Predictor Variables*

Institutional level high school variables	Description
Percent free lunch eligible	The percent of students who were eligible for the free or reduced lunch program
Percent White	The percent of the students at the high school who were White
Percent Black	The percent of the students at the high school who were Black
Percent Hispanic	The percent of the students at the high school who were Hispanic
Size of High School	The number of students enrolled at the high school
Percent passing TAKS Writing	The percent of the students who passed the 11th grade TAKS writing
Percent passing TAKS Reading	The percent of the students who passed the 11th grade TAKS reading
Percent passing TAKS Math	The percent of the students who passed the 11th grade TAKS Math
Student-teacher Ratio	The student to teacher ratio at the high school
Percent At-Risk	The percent of students at the high school that were identified as at-risk by the Texas Education Agency
Percent limited English proficiency	The percent of the student who had limited English proficiency
Percent gifted	The percent of the students, at the high school, who were enrolled in the gifted program
Standardized Percent Met TAKS standards	The standardized percent of students, at the high school, that met TAKS minimum standards
Standardized Percent TAKS commended	The standardized percent of students, at the high school, that met TAKS commended standards

High school institutional variables were also considered. TAKS reading, writing, and math pass rates for 11<sup>th</sup> graders were averaged for 2003-2005 and included in the analysis, in addition to the total number of students who met TAKS standards. The percent of students who were commended on TAKS, the percent of students who were enrolled in gifted courses at their high school is included, as well as the percent of students who were eligible for free lunch, labeled as “at-risk” by the TEA, and the

percent of black, Hispanic, and white students. The student teacher ratio and the total number of students enrolled at the high school are also included to control for size and faculty availability.

The size of the high schools in this sample ranges from 33 students to 4664 students. The minority composition in the sample ranges from high schools with 0% black students to schools with 98% black students, 0% Hispanic students to 100% Hispanic students, and 0% white students to 97% white students. The percent of students at the high school who are eligible to receive free lunch ranges from 0% at more than 100 of the 879 schools, to more 50% of the students at 7 of the schools. The percent of students meeting TAKS standards at the high schools in the sample ranges from 11% to 100%. Of the 879 high schools included in the sample, 274 had 0% students being commended on the TAKS test.

The highest percent of commended students in the sample was 35% of the students being commended for their performance on the TAKS test. The range of size, standardized test performance and racial composition of the Texas public high schools in this sample is tremendous and represents a wide breadth of high school quality and experience. Table 3 presents the mean, standard deviation and kurtosis of the institutional level predictor variables. Some variables were highly skewed; those variables were transformed by taking the square root of the variables to create a more normal distribution (the standard technique applied to left skewed continuous variables). Table 3 presents the original means and transformed means of the affected variables.



Table 3. *Institutional Level Predictor Variables*

Institutional level high school variables	Mean	Standard Deviation	Kurtosis
Proportion free lunch eligible	0.141	0.135	3.095
Proportion White	0.656	0.228	0.365
Proportion Black	0.107	0.130	8.193
Proportion Hispanic	0.189	0.192	5.285
Size of High School	1795.446	849	-0.188
Proportion passing TAKS Writing	0.931	0.061	0.122
Proportion passing TAKS Reading	0.930	0.067	0.065
Proportion passing TAKS Math	0.944	0.052	0.059
Student-teacher Ratio	0.148	0.042	8.724
Proportion At-Risk	0.378	0.184	0.114
Proportion limited English proficiency	0.027	0.032	10.429
Proportion gifted	0.124	0.079	33.382
Proportion met TAKS standards	0.775	0.129	4.018
Proportion TAKS commended	0.047	0.039	1.910

Gender, race, and socioeconomic status have a complex relationship with educational outcomes, access, and experience. The twenty-first century has seen a virtual eradication of male advantage in access to schooling. Women now enroll, and complete degrees, at every level, at higher rates than men, they make up the majority of standardized test takers, they take AP courses at higher rates, and yet, they score considerably lower on the SAT and AP exams; and these differences in enrollment, degree attainment, and standardized testing are further complicated by race (Mickelson, 2008). Nationally, fifty-nine percent of undergraduate degrees are awarded to women; 57% of White bachelor's degree recipients are female, 66% of Black bachelor's degree

recipients are female, and 60% of Latino bachelor's degree recipients are female (Mickelson, 2008).

The Baylor data shows gender trends that are consistent with national averages; the sample is comprised of 58.6 women and approximately 60% of the graduating students were female. Figure 7 shows the breakdown of time to graduate by gender. Men were 17% less likely to graduate than women and 40% less likely to do so in the standard 4 year time frame. Men were 26% more likely to graduate in five years, and 70% more likely to graduate in six years.

Figure 8 shows the breakdown of the sample by gender and race. Seventy percent of the sample self identifies as White, 7% Asian, 13% Hispanic and 9% Black.

Figure 9 shows the graduation rates by race. The Baylor data is consistent with national trends regarding race, gender and graduation. Fifty-eight percent of White bachelor's degree recipients within in the Baylor data are female, compared to 57% nationally. Sixty-nine percent of Black bachelor's degree recipients within the Baylor data are female, compared to 66% nationally, and 63% of Latino bachelor's degree recipients within the Baylor data are female compared to 60% nationally. However, the data also show a strong trend toward failure to retain minority students at Baylor. Among those entering Baylor between 2004-2006, Black students (in particular males) are 60% less likely to graduate from Baylor than are White students, and Hispanic students are 24% less likely to graduate from Baylor than are White students.

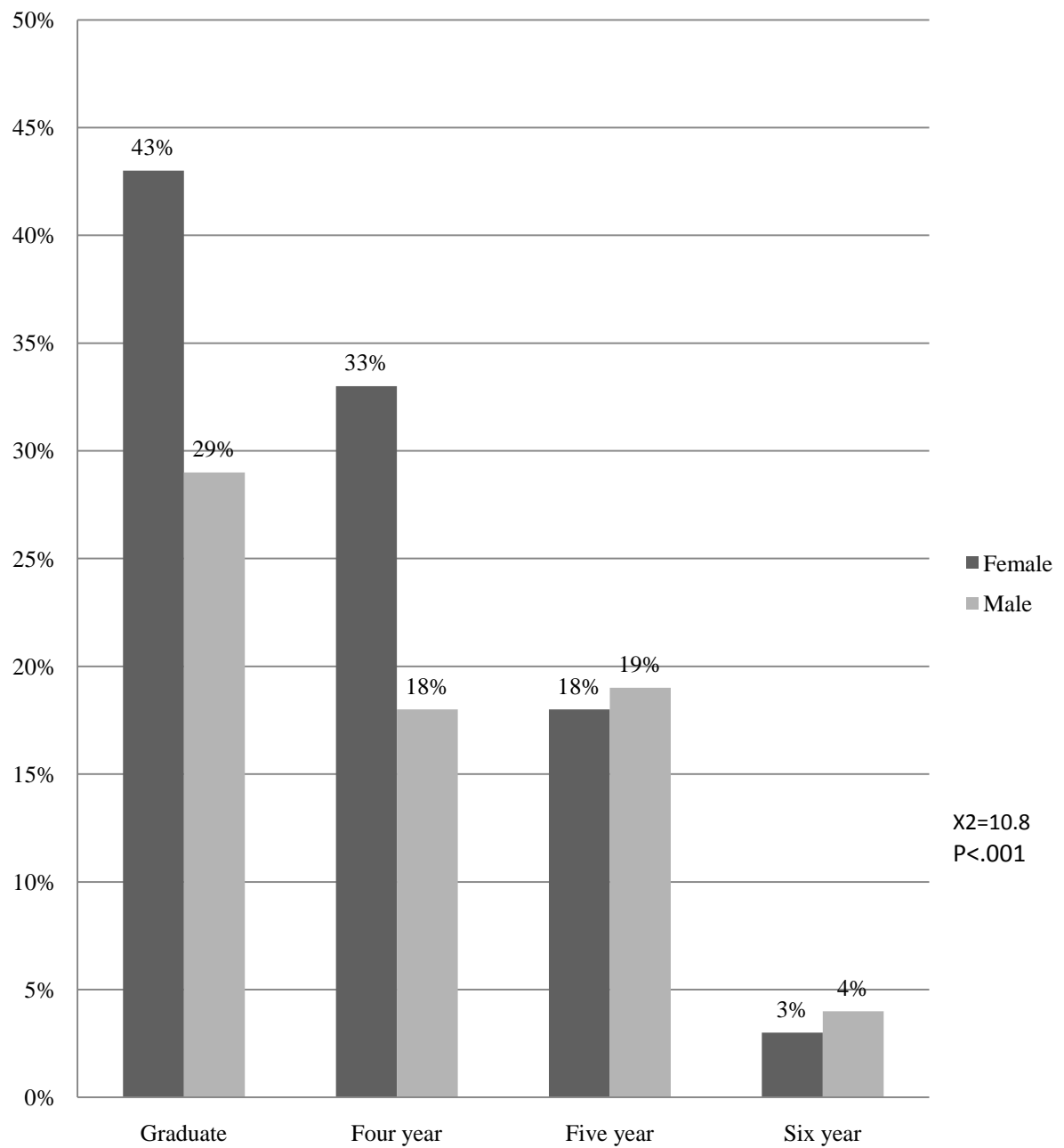


Figure 7. Percent of Baylor students who graduate by gender and timeline

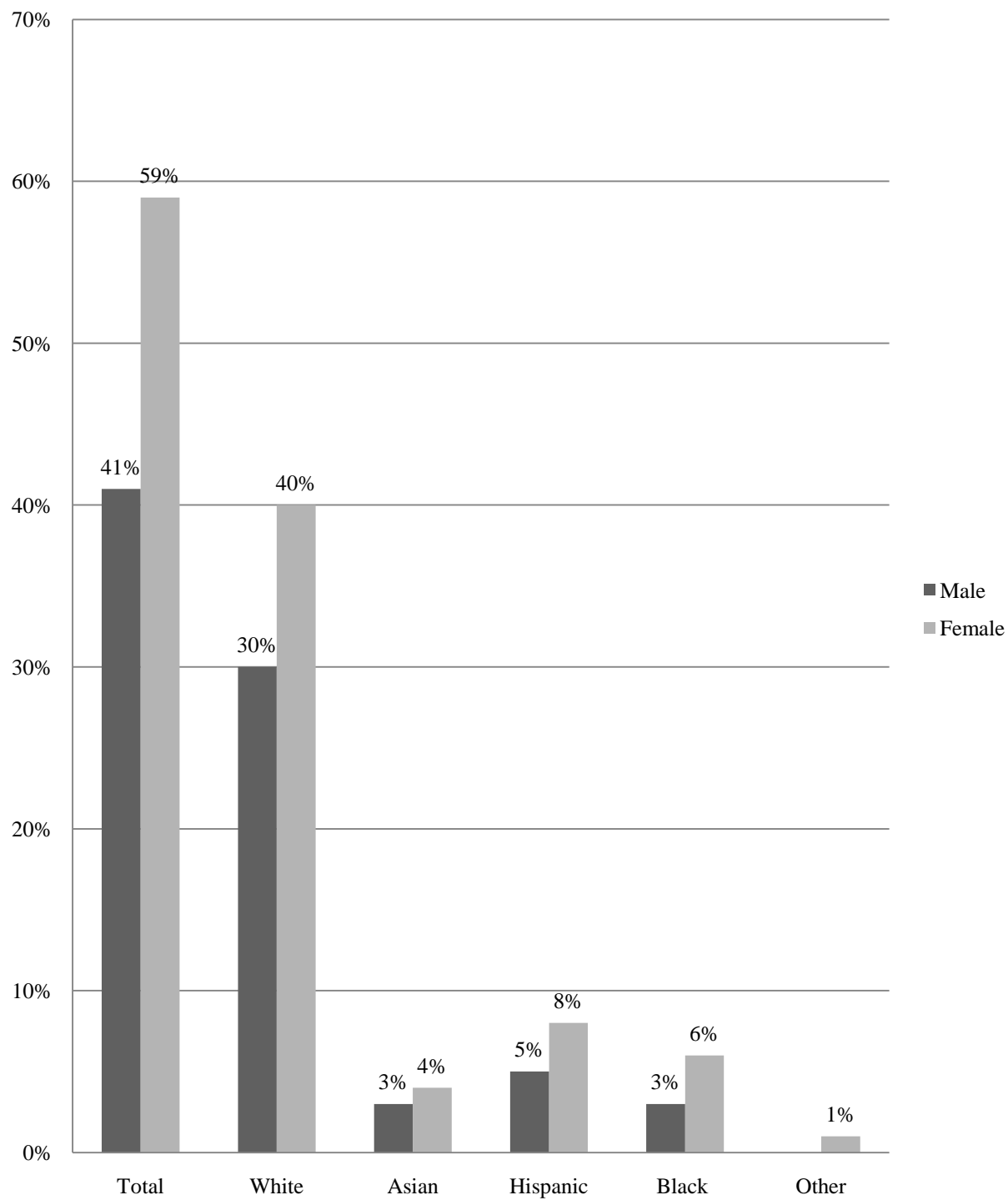


Figure 8. Race and gender of Baylor undergraduate students

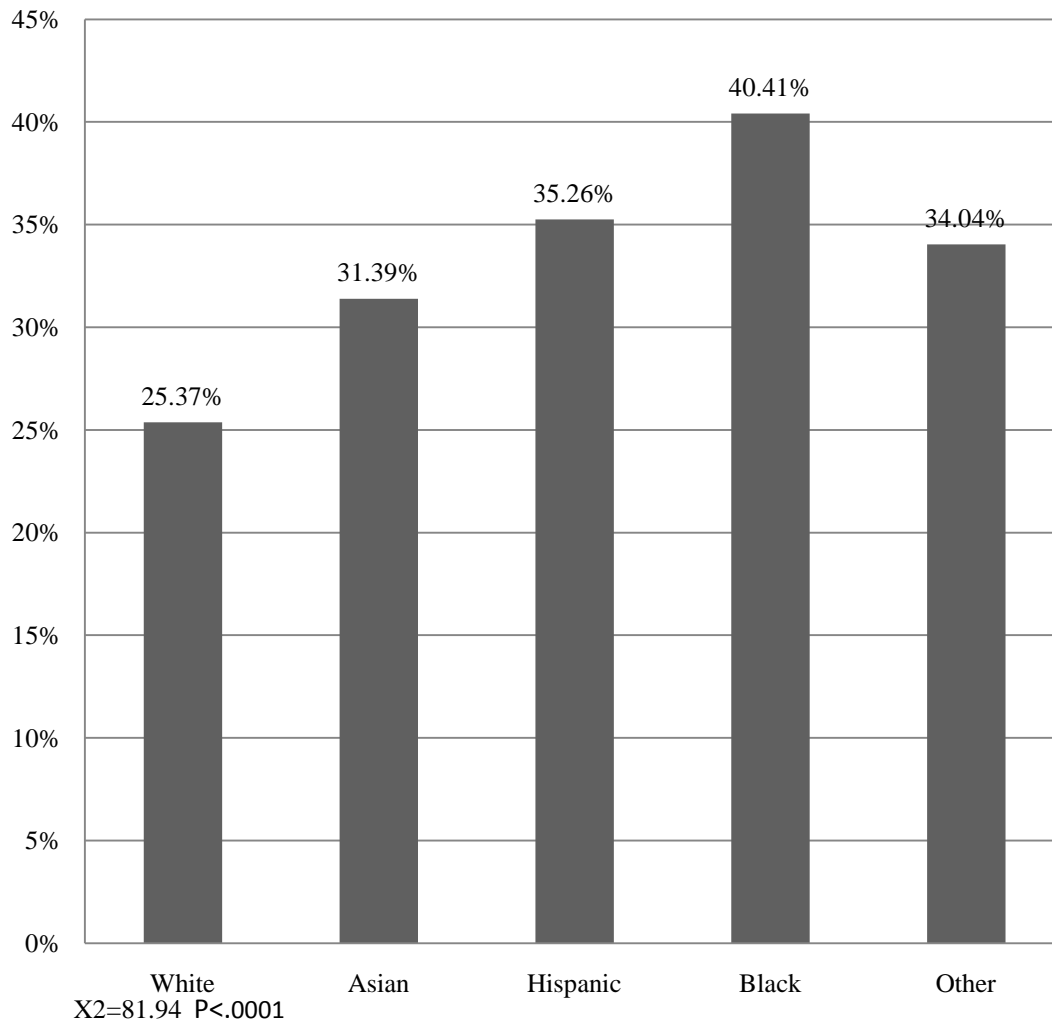


Figure 9. Percent of Baylor students who fail to graduate by race

Nationally, undergraduate G.P.A. is the single, strongest predictor in retention modeling (Geiser & Santelices, 2007). On average White students in the Baylor data graduated with statistically significantly higher undergraduate G.P.A.s than their peers. The average G.P.A. for a White student in the sample was 3.29 compared to 3.21 for Asian students, 3.11 for Hispanic students and 3.0 for Black students. Figure 10 shows the average undergraduate G.P.A. within the sample by race. ANOVAs were estimated to identify whether a significant relationship existed between Baylor G.P.A., and student's race and gender and both were found to be highly significant across all categories.

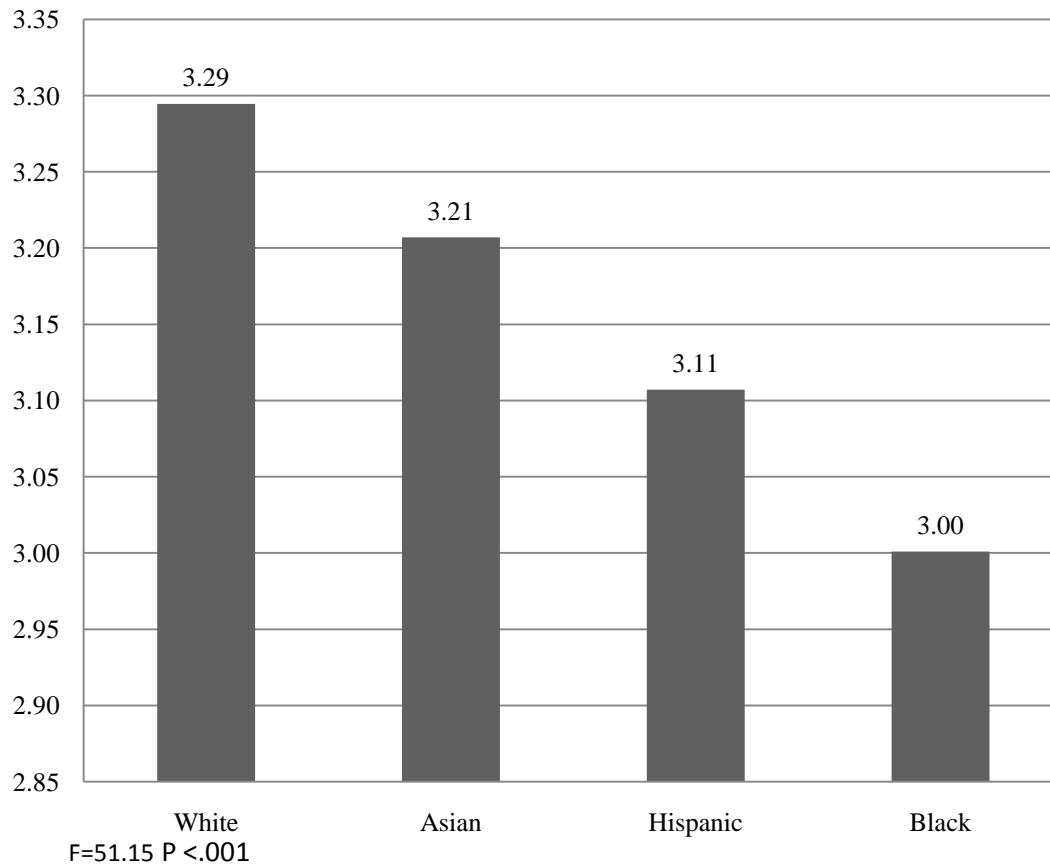


Figure 10. Baylor students' G.P.A. by race

Cultural capital theories, status attainment theories and legitimation theories all lend themselves to the belief that higher income results in educational advantages. The exact nature and relationship between economic advantage and educational advantage is murky, but that a relationship exists is confirmed in most sociological literature. In this sample a significant difference, as estimated by an ANOVA, was found between parent's SES and student's undergraduate G.P.A. The educational advantage of having wealthy parents appears to flatten out with parental income above \$125,000. Figure 11 provides the mean G.P.A. for students in the sample by income bracket. The highest G.P.A.s, on average, were from students whose parents made between \$100,000-\$125,000 annually.

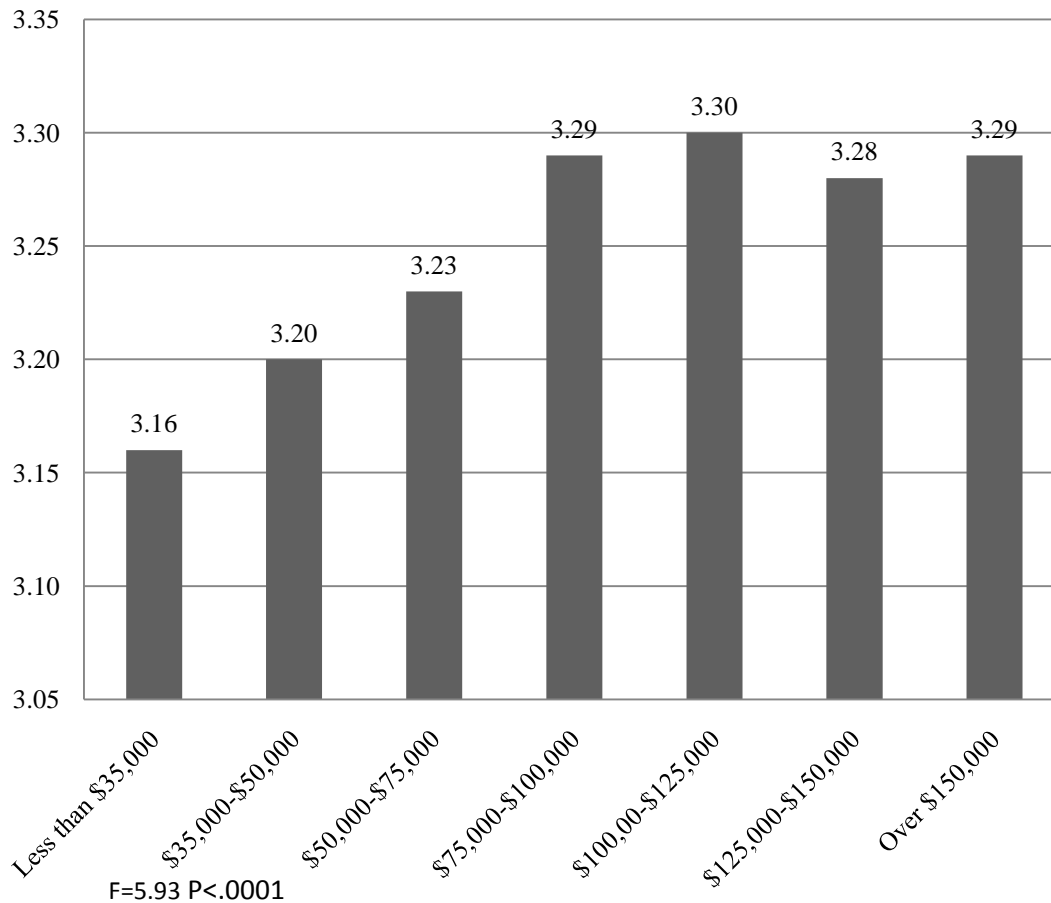


Figure 11. Baylor students' G.P.A. by income

A t-test of graduates and non-graduates also confirmed statistical differences in economic advantage on collegiate success. Graduates are more likely to come from economically advantaged backgrounds than those who do not graduate. Figure 12 shows the percent of students who graduated and failed to graduate by income level. Graduates and economically advantaged students were also more likely to be white. White students were also most likely not to report their income. Table 4 presents the results of the T-Test comparing students who graduate and students who fail to graduate.

Institutional level variables also affect the likelihood of graduating from Baylor University. Those who do not finish at Baylor are more likely to have attended public

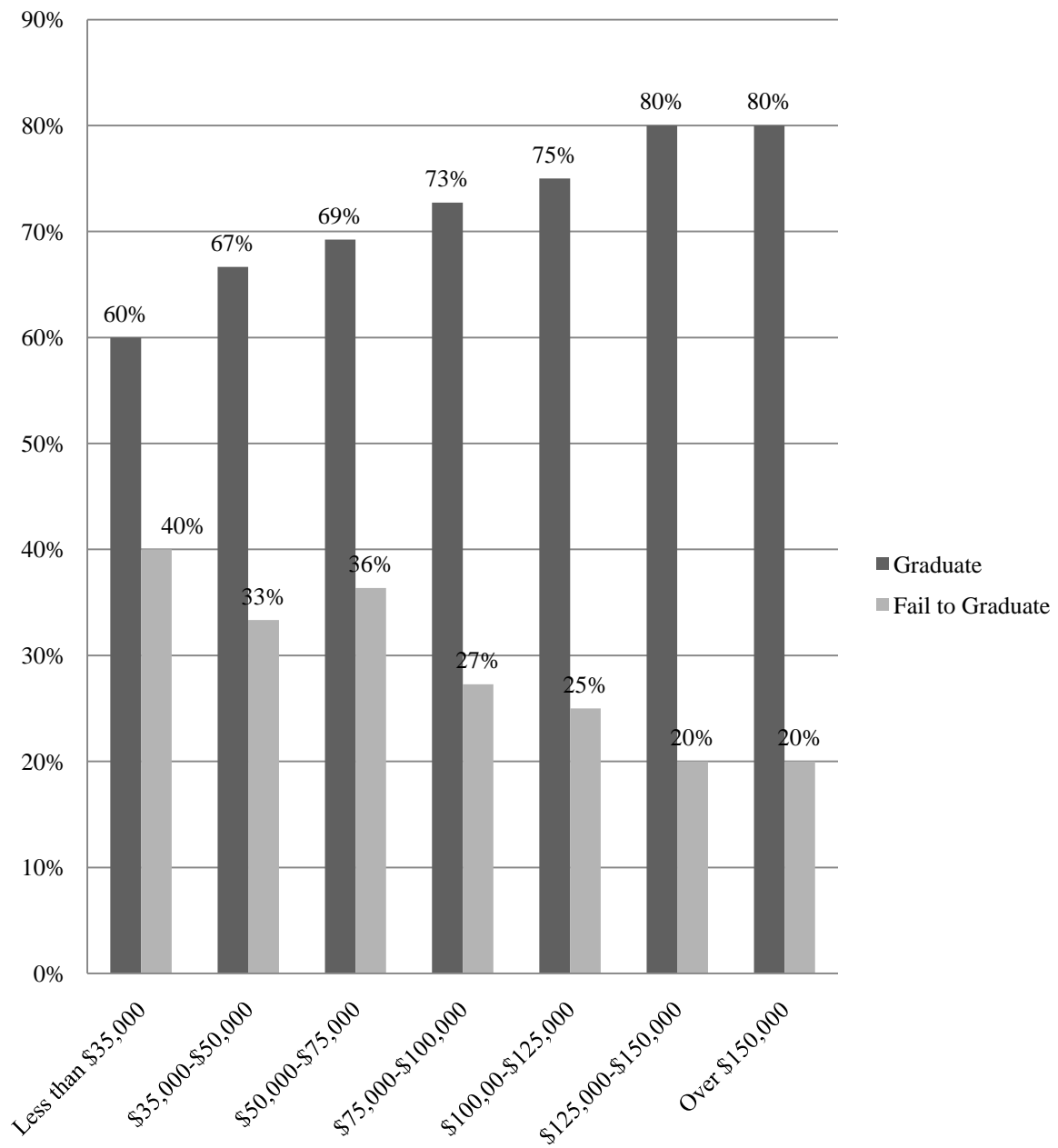


Figure 12. Percent of Baylor students who graduate and fail to retain by income



Table 4. *T-Test of Graduates and Non-Graduates*

Variable	Mean (SD)		t	DF	p
	Graduates	Non-Graduates			
<i>Individual level variables</i>					
Income	3.8208	3.2067	-9.38	4519	<.0001
Race	0.5823	0.8488	8.74	6375	<.0001
Gender	0.4014	0.4461	3.29	6422	0.001
AP courses in High school	0.5682	0.3555	-7.12	4854	<.0001
Father's education	2.591	2.348	-9.94	4565	<.0001
Mother's education	2.5889	2.4208	-7.4	4587	<.0001
<i>Institutional level variables</i>					
Percent of At-Risk Students	0.3687	0.3983	5.28	5265	<.0001
TAKS Writing Pass Rates	93.282	92.7639	-2.41	4035	0.016
TAKS Reading Pass Rates	93.148	92.631	-2.2	4034	0.0276
Size of High School	1816	1746	-2.73	5332	0.0063
Percent meeting TAKS standards	0.7822	0.7587	-6	5257	<.0001
Percent commended on TAKS	0.201	0.1829	-6.46	5257	<.0001
TAKS Math pass rates	94.462	94.373	-0.49	4028	0.6261
Student to teacher ratio	0.1475	0.151	2.85	5332	<.004
Natural log of percent gifted	-2.204	-2.2254	-1.28	5188	0.1991

schools in Texas that had a greater at risk percentage of students, lower pass rates on all core TAKS tests, and a higher student: teacher ratio. The interaction of G.P.A. and institutional level variables is of special salience to this research. High school G.P.A. is frequently used as a top criterion for college admissions and is one of the strongest predictors of collegiate success, but high school G.P.A. acts as a legitimizing variable (Adelman, 1999; Geiser & Santelices, 2007). High school performance is nested in the

organizational structure of the high school. In a non-competitive high school, a high G.P.A. may not indicate the level of preparation and capital that an equivalent G.P.A. would have from a highly ranked, highly competitive school. For the analyses I will use interaction variables for G.P.A. and institutional level variables to evaluate the possible interaction between high school G.P.A., the institutions students' attend, and their collegiate success.

The data presented in this chapter shows that the Baylor students with the right human capital and socioeconomic background are more likely to finish college in 4 years, and have a higher GPA. Additionally, students who attend more privileged public schools have a greater probability of finishing Baylor in 4 years. In the next section, I examine these individual and institutional level factors in a multivariate context to see which factors matter more (individual vs. institutional) and if institutional factors mediate the effects of individual level factors on GPA and graduation. The quality and competitiveness of in the high schools is hypothesized to have an effect on students' success net of other individual level factors.

## CHAPTER THREE

### Results

In the previous chapter I show that individual and institutional level factors are correlated with two important measures of academic success in college: overall G.P.A. and finishing college on time. In this chapter I examine to what extent individual and institutional factors affect these measures in a multivariate context. I begin with an ordinary least squares analysis block model of overall G.P.A. and then proceed to logit models of retention (graduate or not) and how long it took the student to graduate (4, 5 or 6 years).

#### *Factor Analysis*

There is a plethora of institutional level data from the Texas Education Agency. However, many of these indicators are highly statistically correlated. Parsing out the effects in regression models will be difficult given the level of multicollinearity that would be present in the models. I therefore begin with a factor analysis of all institutional level variables and reduce the data used in the analysis to three measures. Three factors were identified as a result of the factor analysis. The high risk variable loaded onto a factor and included the percent of students who were eligible for the free lunch program, the square root of the percent of black students, the natural log of the percent of Hispanic students, and the percent of students identified as at-risk by the high schools. These four variables were standardized and used to create an at-risk index. The standardized Cronbach Alpha of the high-risk factor was 0.7715. The percent of students who passed the writing, reading and math TAKS tests all loaded onto a second factor

with a standardized Cronbach Alpha of 0.8011. These three variables were standardized and used to create a TAKS achievement index. The log of students who were labeled as gifted by their high school is the third institutional measure used in the analysis.

### *OLS*

Ordinary least squares regressions were estimated predicting Baylor G.P.A. Four regressions were estimated (1) predicting G.P.A. using individual level variables, (2) predicting G.P.A. using high school level institutional level variables only, (3) predicting G.P.A. using individual level variables, and institutional level variables (4) predicting G.P.A. using individual level variables, institutional level variables, and cross level interactional variables for individual's high school G.P.A. percentage and the school level variables: high risk, high TAKS, and log gifted.

### *Individual and Institutional Level Results*

Across the individual level model and the combined model, G.P.A. percentage has the strongest predictive effect on college G.P.A, which is consistent with the literature on high school grades (Geiser & Santelices, 2007). For each one unit increase in HS GPA, Baylor GPA is predicted to increase by .62 points. Gender and race have significant predictive effects on G.P.A in the individual level model. Females have higher net GPAs, as do White students. SAT score has a significant positive effect but the estimate was minimal compared to HS GPA. The count of AP courses and mother's education were both positive and significant in predicting college G.P.A, but father's education, which is the standard variable for attainment models, had no significant effect. Enrollment year, which was included as a control variable for which matriculation class the student belonged to was also significant. The three institutional level indices had a

very small impact on Baylor GPA ( $r\text{-square}=.0029$ ). The only significant variable in Model 2 was the Log gifted students. Texas districts with a greater percentage of gifted students produce Baylor graduates with slightly but significantly higher GPAs.

Table 5. *Ordinary Least Squares Predicting Baylor GPA*

	Model 1		Model 2	
Variable	Estimate	Standard Error	Estimate	Standard Error
Intercept	1.3322*	0.1096	3.3279*	0.0356
Gender	-0.1530*	0.0146		
Race	-0.0421*	0.0067		
Parent's Income	0.0043	0.0038		
First Generation	-.0324	0.0242		
SAT Total	0.0011*	0.0001		
Provisional Admit	-0.0783*	0.0328		
Enrollment Year	0.0263*	0.0088		
GPA Percentage	0.6222*	0.0527		
AP Count	0.0306*	0.0113		
Father's Education	0.01813	0.01784		
Mother's Education	0.0382*	0.0169		
Distance from Home	.0000	.0000		
Risk Issues			-0.0167	0.0109
High Taks			-0.0056	0.011
Log Gifted			0.0382*	0.0159
	R-Square=.2861		R-Square=.0029	
	N=1916		N=2876	

### *Combined Results*

Models three and four, which are presented in Table Six, included both institutional and individual level variables. The data in Model 3 show where the institutional and individual level effects contrast. The results show clear support for individual level variables. The variable that retains the strongest level of significance is HS GPA. Net of school measures, having a high GPA in high school translates into a higher GPA at Baylor. There are still gender and race differences in Baylor GPA. School level effects take out two significant individual level effects: provisional admission and the effect of taking AP courses in high school. Neither of these findings should be surprising, as better equipped schools can provide greater AP offerings, and provisional students are more likely to come from schools in at-risk areas. However, none of the institutional level variables have a direct significant effect on GPA.

Of the three interaction variables included in model four, only the interaction between high school G.P.A. and high TAKS was significant with an estimate of 0.0039.

### *HLM*

The individual and institutional level data lend themselves appropriately to concerns regarding nesting or hierarchical data. Indeed, one school may potentially buck the trend of TAKS or risk issues and produce students that statistically differ in regards to collegiate success. To control for issues regarding nested data, hierarchical linear models were run to predict college G.P.A. The results of the HLM models are relatively congruent with the results of the OLS models. Individual level variables are strongest in all four models, and the significant interaction effect is the same, but HLM does produce

a significant institutional level variable not found in the OLS models. In the unconditional HLM model the intercept was 3.2394 and was significant.

Table 6. *Ordinary Least Squares Predicting Baylor GPA*

Variable	Model 3		Model 4	
	Estimate	Standard Error	Estimate	Standard Error
Intercept	1.3649*	0.1428	1.2118*	0.2169
Gender	-		-	
	0.1223*	0.0181	0.1198*	0.0181
Race	-		-	
	0.0451*	0.0085	0.0447*	0.0085
Parent's Income	0.0074	0.0047	0.0075	0.0047
First Generation	-0.0368	0.0307	-0.0366	0.0305
SAT Total	0.0012*	0.0001	0.0011*	0.0001
Provisional Admit	-0.0396	0.0404	-0.0398	0.0402
Enrollment Year	0.0289*	0.0111	0.0306*	0.0110
GPA Percentage	0.4637*	0.0634	0.5746*	0.0673
AP Count	0.0086	0.0092	0.0077	0.0092
Father's Education	0.0092	0.0230	0.0067	0.0229
Mother's Education	0.0439*	0.0216	0.0429*	0.0215
Distance from Home	-0.0001	0.0001	-0.0001	0.0001
Risk Issues	0.0202	0.0132	0.0317	0.0305
High Taks	0.0078	0.0114	0.0010	0.0018
Log Gifted	0.0070	0.0168	0.0126	0.0168
Interaction effect High school G.P.A. and High Taks			-	
			0.0039*	0.0019
Interaction effect High school G.P.A. and Risk Issues			-0.0002	0.0295
Interaction effect High school G.P.A. and Log Gifted			0.0053	0.0199
	R-Square=.2758		R-Square=.2774	
	N=1916		N=1916	

### *HLM Individual and Institutional Level Results*

In the conditional model with level-one effects, which is presented in Table 7, the intercept, gender, race, parent's income, SAT total, provisional admittance, enrollment year, high school G.P.A. percentage and mother's education were all significant variables in predicting Baylor G.P.A. For each percentage point increase in HS GPA, Baylor GPA is predicted to increase by .7985 points. Gender and race have significant predictive effects on G.P.A in the individual level model. Females have higher net GPAs, as do White students. SAT score has a significant positive effect but the estimate was very small compared to HS GPA. Mother's education was both positive and significant in predicting college G.P.A, but father's education, which is the standard variable for attainment models, had no significant effect. APcount, which was significant in the OLS models, was not significant in the HLM models, suggesting a relationship between high school quality, AP availability, and student success. The significance of enrollment year may be due to higher standards in the admission process or an increasingly competitive freshman class. The institutional results of the HLM model contrasts with the OLS results. In the OLS model, log gifted was significant but in the HLM model the only institutional level variable of significance is the index of risk issues.

### *Combined Results*

The conditional model with level one, level two and cross level effects is presented in Table 8. When individual and institutional level variables are included in the same HLM model, the effects of the institutional level variables are washed out. The results of the combined HLM model are consistent with the results of the OLS model. None of the institutional level variables are significant, but the interaction between high



school G.P.A. and high TAKS scores is significant. Interaction effects for gender, race, parent's income, and first generation by the institutional level variables were all run as well. Three additional interaction effects were found to be significant: parent's income and log gifted with a coefficient of .018, gender and risk issues with a coefficient of .1338, and AP count and risk issues with a coefficient of .067. The interaction of gender and risk issues is a relatively large effect and may help to explain some of the cross-model significance of gender.

Table 7. *HLM Models predicting Baylor G.P.A.*

Variable	Unconditional Model		Conditional Model-level one effect	
	Coefficient	SE	Coefficient	SE
Intercept	3.2394*	0.0079	1.2005*	0.1105
Gender			-0.1443*	0.0145
Race			-0.04198*	0.0068
Parent's Income			0.0037	0.0037
First Generation			-0.0332	0.0241
SAT Total			0.0010*	0.0001
Distance from Home			-0.0000	0.0001
Provisional Admit			-0.0635*	0.0325
Enrollment Year			0.0296*	0.0088
GPA Percentage			0.7985*	0.0589
Father's Education			0.0170	0.0178
Mother's Education			0.0381*	0.0168
AP Count			0.0128	0.0076
	N=4634		N=2936	

Table 8. *HLM Models predicting Baylor G.P.A.*

Variable	Conditional Model- level two effect		Conditional Model- level one, two and cross level effect	
	Coefficient	SE	Coefficient	SE
Intercept	3.3310*	0.1919	-1.565*	1.2856
Gender			-0.1161*	0.0181
Race			-0.0452*	0.0086
Parent's Income			0.0065	0.0047
First Generation			-0.0362	0.0305
SAT Total			0.0011*	0.0001
Distance from Home			-0.0001	0.0001
Provisional Admit			-0.0312	0.0401
Enrollment Year			0.0348*	0.0110
GPA Percentage			3.524	1.2868
Father's Education			0.0051	0.0230
Mother's Education			0.0410*	0.0214
AP Count			0.0072	0.0093
Risk Issues	-0.0598*	0.0300	0.0419	0.0386
High Taks	-0.0006	0.0020	0.0008	0.0022
Log Gifted	0.0271	0.0180	0.0069	0.0207
Interaction effect High school G.P.A. and High Taks			-0.0048*	0.0020
Interaction effect High school G.P.A. and Risk Issues			-0.0167	0.0317
Interaction effect High school G.P.A. and Log Gifted			-0.0052	0.0208
N=3017			N=1916	

### *Binary Logistic Regression*

Binary logistic regressions were estimated to predict the probability that a student would fail to graduate with an undergraduate degree from Baylor (1=fail to earn a degree). Four logistic regressions were estimated (1) predicting failure to graduate using individual level variables, (2) predicting failure to graduate using high school level institutional level variables, (3) predicting failure to graduate using individual level variables, and institutional level variables (4) predicting failure to graduate using individual level variables, institutional level variables, and cross level interactional variables for individual's high school G.P.A. percentage and the school level variables: high risk, high TAKS, and log gifted.

#### *Logit Individual Level Results*

In the individual level model, gender, race, parent's income, provisional admittance, G.P.A. percentage, father's education and mother's education were all significant predictors in failure to graduate. The odds that a male fails to earn a degree from Baylor are, *ceteris paribus*, 32% greater than the odds of a female failing to earn a degree from Baylor. Net of this result, nonwhite students have significantly greater odds of failing to earn a degree than do White students. Race is not exclusively about income and parental education differences at the individual level. However, both significantly affect the likelihood of failing to earn a degree. For each unit increase in income the odds of failing to graduate decline by 7%. Moreover, mother and father's education have strong, negative effects. If a student's father graduated from college then the student has 28% lower odds of failing to earn a degree from Baylor. The same finding applies to mother's education. High school GPA has the strongest effect. For each unit increase in

the high school GPA of the student the odds of not earning a degree from Baylor increase by 90%. The students who are at greatest risk of not finishing a degree from Baylor (i.e. non-retention) are provisional admit students. The odds that a provisional admit student fails to graduate from Baylor are 44% greater than the odds for a comparable non-provisional admit student.

#### *Logit Institutional Level Results*

In the institutional model, two of the institutional level measures were significant: risk issues and log gifted students. For every standard deviation increase in the risky school index, the odds of failing to earn a degree from Baylor increase by 65%. Net of this effect, for every percent increase in the proportion of gifted students there are in the school the odds of failing to graduate from Baylor decrease by 6.7%. Logistic models for institutional level variables are presented in table 7.

#### *Logit Combined Results*

Table 8 presents the results of the combined individual and institutional level effects. The results are quite interesting. At the individual level the following variables retain significance from the individual only model in Table 7: gender, race, parent's income, G.P.A. percentage. The largest predictor of failure to graduate was HS GPA percentage, as it was in Table 7. The major changes when the models are combined are the strong effects of mother's and father's education are no longer significant predictors of failure to graduate when institutional level variables are introduced into the model.

Table 9. *Logit Model Predicting Fail to Graduate*

Variable	Model 1			Model 2		
	Parameter Estimate	Standard Error	OR	Parameter Estimate	Standard Error	OR
Intercept	3.3372*	0.5686		-1.2193	0.708	
Gender	0.2782*	0.0757	1.3210			
Race	0.0658*	0.0326	1.0680			
Parent's Income	-0.0791*	0.0200	0.9240			
First Generation	0.1103	0.1117	1.1170			
SAT Total	-0.00153*	0.0003	0.9980			
Distance from Home	-0.0001	0.0003	1.0000			
Provisional Admit	0.3651*	0.1368	1.4410			
Enrollment Year	-0.0638	0.0465	0.9380			
GPA	-2.3036*	0.2886	0.1000			
Percentage						
Father's Education	-0.3384*	0.0875	0.7130			
Mother's Education	-0.2046*	0.0849	0.8150			
AP Count	-0.0696	0.0437	0.9330			
Risk Issues				0.4987*	0.1070	1.647
High Taks				0.0019	0.007	1.002
Log Gifted				-0.1363*	0.0670	0.873
	Max rescaled R-Square=0.1133			Max rescaled R-Square=0.011		
	N= 2646			N=3930		

Students from high risk schools have odds of failing to graduate 45% greater than comparable students from lower risk schools. The effects of parent's education, a major concept in the status attainment model of attainment, are usurped by the 'quality' of the public school system. There are two ways to explain this relationship. First, the effects of going to a high risk school eliminate and advantage of parent's education on student's probability of graduating from Baylor. A more likely explanation is that the relationship

between parent's education and student's likelihood of graduating from Baylor is spurious. Highly educated parents are likely to avoid high risk schools.

However, the results are particularly concerning for two other reasons. First, for those parents of Baylor students who did not graduate from college and who live in high risk districts, they face an uphill battle in getting their student to a situation where they earn a degree from Baylor. Second, provisional admission is no longer significant in the combined model (Table 8). This indicates that Baylor is drawing provisional students primarily from high risk schools.

### *Multinomial Logistic Regression*

In this section, I examine which individual and institutional factors are associated with delayed graduation. I use multinomial logistic regression to estimate the probability that a student would graduate in five or six years as opposed to the standard four years to graduate with a bachelor's degree. There are a variety of individual level reasons which could delay graduation, such as changing major, family/personal illness, financial issues, etc. I cannot identify and document each factor that delays graduation. However, I can examine which individual and institutional factors are associated with delayed graduation. This is an important investigation, because if a student perceives that s/he is on the delayed graduation track it may affect long-term retention.

Table 10. *Logit Model Predicting Fail to Graduate*

Variable	Model 3			Model 4		
	Parameter Estimate	Standard Error	OR	Parameter Estimate	Standard Error	OR
Intercept	2.2108*	1.1177		8.0721	6.2825	
Gender	0.2211*	0.0947	1.2470	0.2211*	0.0948	1.247
Race	0.0872*	0.0416	1.0910	0.0882*	0.0417	1.092
Parent's Income	-0.0519*	0.0251	0.9490	-0.0515*	0.0252	0.95
First Generation	0.2018	0.1400	1.2240	0.1889	0.1405	1.208
SAT Total	-0.0017*	0.0004	0.9980	-0.0017*	0.0004	0.998
Distance from Home	-0.0008	0.0005	0.9990	-0.0007	0.00054	0.999
Provisional Admit	0.2821	0.1711	1.3260	0.2856	0.1717	1.331
Enrollment Year	-0.0515	0.0588	0.9500	-0.0515	0.0589	0.95
GPA	-1.9087*	0.3467	0.1480	-8.229	6.6669	<0.001
Percentage						
Father's Education	-0.2349	0.1118	0.7910	-0.2349*	0.1121	0.791
Mother's Education	-0.197	0.1077	0.8210	-0.1968	0.1079	0.821
AP Count	-0.1013	0.0546	0.9040	-0.101	0.0547	0.904
Risk Issues	0.375*	0.1662	1.4550	0.3317*	0.1685	1.393
High Taks	0.00776	0.0097	1.0080	0.00903	0.01	1.009
Log Gifted	-0.1066	0.0835	0.8990	-0.12	0.0871	0.887
Interaction effect High school G.P.A. and High Taks				0.0086	0.0105	1.009
Interaction effect High school G.P.A. and Risk Issues				-0.2582	0.1572	0.772
Interaction effect High school G.P.A. and Log Gifted				-0.0123	0.1001	0.988
	Max rescaled R-Square=0.1091 N= 2646			Max rescaled R-Square=0.1115 N= 2646		

In this model, which is presented in table eleven, none of the institutional variables were significant. Like the logit models, it appears that institutional level variables are significant in predicting collegiate success when success is defined by college G.P.A., but are not a strong predictor of graduation regardless of whether graduation is within four years or extended to the delayed five or six year graduation. The significant variables in the multinomial logit were: gender for five and six year, parents' income for five year, and SAT total for five and six year.

Family income has some effect. With each unit decrease in parents' income the odds of a student taking an extra year to graduate increase by 11%. Parents' income, however, is limited to a one year delay in graduation. It is not significant in predicting six year graduation rates. Not surprising, SAT score matters. For every 100 additional points earned on the SAT the odds of finishing the degree in 4 years increase by at least 24%. The major culprit in delayed graduation is gender. Regardless of socioeconomic background, high school grade performance, and quality of the public school attended, male students are at greater risk of delaying graduation. More specifically, male students have 71% higher odds of taking an extra year to graduate than female students. Moreover, male students have odds 2.11 times greater than women in taking two extra years to complete the bachelor degree. Since the 1990's, the focus of educational researchers interested in gender disparities, has shifted from a focus on educational equality for women, to understanding why women outperform men in high schools and colleges (Diprete & Buchmann, 2013; Gurian, 2010; Weaver-Hightower, 2003). In colleges and high schools, women graduate at higher rates, and receive higher G.P.A.s; the root cause of gender disparities is still debated among educators, psychologist,



sociologists and other schools, but the results of this study suggest that Baylor is not an exception to the national trend of male underperformance (Diprete & Buchmann, 2013; Gurian, 2010).

Table 11. *Multinomial Logit Results of More than 4 years to Graduate*

Parameter	Function	Estimate	Standard Error	Odds Ratio
Intercept	6 Year	2.5246	3.0452	12.4286
	5 Year	2.7586*	1.3716	15.7779
Gender	6 Year	0.7500*	0.2598	2.11
	5 Year	0.5403*	0.1160	1.71
Race	6 Year	-0.0170	0.1217	1.017
	5 Year	0.0682	0.0533	1.0706
Parent's Income	6 Year	-0.0797	0.0690	1.0529
	5 Year	-0.1028*	0.0304	1.1108
First Generation	6 Year	0.3788	0.3867	1.4605
	5 Year	0.2914	0.1862	1.3383
SAT Total	6 Year	-0.0030*	0.0011	1.003
	5 Year	-0.0022*	0.0005	1.0022
Provisional Admit	6 Year	0.6393	0.4239	1.8946
	5 Year	0.0030	0.2449	1.003
Enrollment Year	6 Year	-0.2519	0.1680	1.2865
	5 Year	0.0685	0.0716	1.0709
GPA Percentage	6 Year	-1.2818	0.9829	3.6031
	5 Year	-0.5675	0.4177	1.7638
Father's Education	6 Year	-0.2756	0.3133	1.3173
	5 Year	0.1229	0.1463	1.1307
Mother's Education	6 Year	-0.2712	0.3044	1.3115
	5 Year	-0.1495	0.1372	1.1612
AP count	6 Year	-0.1358	0.1692	1.1454
	5 Year	-0.0523	0.0632	1.0537
Risk Issues	6 Year	0.1507	0.4083	1.1626
	5 Year	-0.1431	0.1855	1.1538
High Taks	6 Year	-0.0006	0.0257	1.0006
	5 Year	-0.0175	0.0114	1.0177
Log Gifted	6 Year	0.0800	0.2405	1.0833
	5 Year	-0.1559	0.1045	1.1687
N=1907				

## CHAPTER FOUR

### Conclusion

School inequity, disparate levels and types of cultural capital and unequal levels of parental education and occupational attainment all contribute to creating an economic landscape that is characterized by inequality in antecedent variables and presumably leveled by a meritocratic educational environment and credentialing society. Radford's research on valedictorians, combined with decades of research on student choice, enrollment and success suggests that students' choice of schools, their experience at those institutions, and their success in the collegiate environment is a product, not simply of their ability and merit, but of the antecedent variables, experiences, abilities and beliefs that they bring to those institutions (Radford, 2013).

Nationally, 57% of American college students graduate with a bachelor's degree; approximately a third of college students are able to do so within the standard four year time frame (Astin & Oseguera, 2005). The national numbers are significantly lower than the numbers from Baylor, which consistently sees graduation rates above 70%. In this study, 72% of undergraduates received their degree within six years, and that number appears to be rising with subsequent cohorts. Fifty-one percent of Baylor's students are able to graduate within the standard 4 year time frame. Baylor's high level of retention is consistent with other Christian colleges and universities, which typically have higher than expected rates of degree completion (Astin & Oseguera, 2005). One argument for why Christian colleges outperform the standard models may be due to the increased strength of non-academic factors in their students, such as a stronger relationship to the college or

university and an increased sense of purpose for their academic careers, both of which have been shown to have a stronger relationship to college retention than high school GPA, or ACT scores (Lotkowski et al., 2004).

The educational and occupational attainment literature paints a detailed and complex picture of how an individual's education is affected by family experiences, individual characteristics, and the interplay that those individual level characteristics have in both predicting the experience and success of one's educational endeavors. In this research I've incorporated attainment variables by controlling for parent's educational attainment and parent's income. The parents of students in the sample have higher levels of educational attainment than national averages would predict. Two thirds of the sample comes from a home, where at least one parent graduated from college. In both the OLS and HLM models mother's education was a significant predictor of college G.P.A., but father's education was not. Contrasting that with the logit models predicting failure to graduate, in which mother and father's education was significant before institutional level variables were added, suggests a relationship between parental educational attainment and student educational attainment that is significantly more complicated than the classical theories would suggest. The results suggest that both parents' educational backgrounds play an important part in the credentialing process of college, but only the mother's education plays a role in encouraging higher G.P.A.s. The stronger effect of mothers' education on G.P.A. suggests that mothers may play a more active role in supervising and encouraging students in their daily work than fathers. It may also indicate that mothers have a stronger impact on students in college because they are more

likely to maintain high levels of communication and influence, even when children are out of the home.

The other attainment variable that was included was parents' income. The socioeconomic variable is a proxy for parents' occupational attainment. The income variable was coded as an ordinal variable with missing cases removed from the analysis. Parents' income was not significant in predicting G.P.A. in either the OLS Models or the HLM models, but it was a significant variable in predicting all the logit models predicting failure to graduate and in the multinomial model. Students from higher income families are more likely to graduate and more likely to graduate in the standard four year time frame. In terms of sociological theory, both attainment variables suggest that parents' occupational and educational attainment may have a stronger effect on students' ability to complete their undergraduate coursework than it does their success in those courses. It appears that the effect of parents' education does not extend far beyond the first day of class. Since all the graduates in the sample had a 2.0 or higher, as per Baylor's policy, and the sample average G.P.A. was over a 3.0 in every income and racial category, the focus on completion may not be incongruent with success.

The effect of attainment on graduation, but not G.P.A. fits in line with credentialists' arguments that we, as a nation, are becoming increasingly focused on education as an institution more interested in the conferral of presumed ability than fostering actual ability (Collins, 1979). The relationship between income and failure to graduate fits in line well with the Marxist assertion that the rich will cultivate a belief in the legitimacy of the system. Indeed, educational attainment in this study is predicted by

economic advantage, and wealthy students are more likely to leave Baylor with the status of “graduate” and all the rights, capacities and privileges that the status entitles them to.

The random effects of the high school variables in this study lends support to the Jencks et al. (1981) hypothesis that high school quality doesn’t matter and that the socializing element inherent in enrollment in school, and the conferral of graduates is the purpose and success of the educational system. The combined logit model was the only model in which an institutional variable was significant when individual level variables were controlled for. In the combined logit model predicting failure to graduate, the risk issues index was a significant variable, with a relatively large effect. Risk issues, which is an index variable combining the percent of students who were free lunch eligible at the high school, the percent of minority students, and the percent of students labeled “at-risk” by the Texas Education Agency, was not significant in predicting G.P.A in either the combined HLM or combined OLS models. The relatively small effect of the high school variables also lends support to Jencks et al.’s (1981) hypothesis or the effect of risk issues in predicting graduation could be used to refute their argument. If credentialing is the most important factor in education, and curriculum, competition, and the class of the students’ colleagues are not relevant than the high school variables should effect G.P.A., but shouldn’t have an effect on graduation.

Cultural capital is a notoriously difficult thing to code, since it includes three forms, all of which can be more subtle or insidious in student populations and statistical models. Parents’ income can serve as representation of economic capital, parents’ education, AP classes and high school institutional factors can serve as weak proxies for cultural capital as they indicate the educational enrichment available at home, the quality

of peers that students were surrounded by and the advantage they were able to take in their high school institutions. The problem with the operationalization of cultural capital is that it is inherently subjective. Whether a student's AP course enrollment is associated with higher a G.P.A. may be interpreted as a function of intergenerational transmission of habitus, or the acquisition of learned skills and study behaviors required for upper level classes. The data in this sample has several limitations, which I will discuss at length in the latter part of this chapter, but one of the main limitations is the homogeneity of the sample. All of the students in the sample are enrolled at one institution of higher education, and all of the students come from public, Texas, high schools. Cultural capital theories on education may be better tested using more than one college or university and incorporate students from a wider variety of high schools in order to test the transmission theory of cultural capital and education.

AP courses are offered in about 62% of the nation's high schools and are believed to "serve as indicators of the quality of the academic program offered" at the high school as well as demonstrating the students' ability to take advantage of opportunities that are afforded to them (Geiser and Santelices, 2004; National Research Council, 2002). Geiser and Santelices's (2004) research suggests that while AP test results are an excellent indicator of collegiate success, AP course enrollment may be a better indicator of high school quality, and socio-economic advantage than it is of college preparedness. In this study the number of AP classes that a student took was not significant in any of the combined models, which indicate support for Geiser and Sanetelice's assertion that AP course enrollment is an indicator of high school quality and socioeconomic advantage.

Cultural capital can also be operationalized by looking at parents' education. Children of educated parents are more likely to have experience and exposure to the collegiate culture. Educated parents are also more likely to be familiar with the bureaucratic process of enrollment, advisement, and financial aid, which should benefit children in the initial phases of navigating the university. Parents' education was significant in predicting failure to graduate, until institutional level variables were added to the model and then the effect of parents' was washed out. Mother's education was significant in predicting G.P.A. across OLS and HLM models. The limited effect of parents' education may be related to the homogeneity of the sample, which has significantly higher educated parents than the national averages.

Two out of the three of the institutional variables were significant in some of the models. Loggifted, which was the log of the percent of students labeled as gifted, was significant in predicting G.P.A. in the OLS models when no individual variables were included, but washed out when individual level data was introduced into the model. In the HLM models, risk issues was significant in predicting G.P.A., but it too fell away when individual data was added to the model. The significance of the interaction of high TAKS and high school G.P.A. in the combined OLS and HLM models suggests some relationship between higher G.P.A.s at high achieving schools, but the results do not indicate a strong relationship between the transfers of high school cultural capital to college capital net of individual factors.

There were a number of limitations to this study. The sample that was used for analyses consisted of only in-state, public school students. Since school level data was not available for private school students, or out of state students a large number of

undergraduates were cut from the sample. Ideally, these exclusions created a more homogenous sample from which to test the effects of individual versus institutional level variables, but it does raise concerns regarding the possibility of introduced in-state versus out-of-state and private versus public bias.

The use of one undergraduate institution introduced a similar limitation. The inclusion of only one institution limits issues and concerns regarding variation between institutions in size, culture and quality, but does pose a limitation to the generalizability of the research. Baylor is a private, mid-sized, Christian university with a small student to faculty ratio and an emphasis on undergraduate education and research. There are factors about the university that may help eliminate some disparities in cultural capital and level the playing field. It may also serve to attract a slightly different type of student than similar sized, secular or public institutions.

Both data sets suffer from issues with missing data. The income variable in the student data was missing for approximately one third of the students. Missing income data may be a result of poverty, or extreme prosperity; future research should focus on creating a proxy, index or control variable that eliminates the bias that may be introduced by this data omission. The Texas Education Agency data has missing values for some years, some schools, and some variables all together. The data used in this research for institutional variables was averaged across all available years to compensate for missing information in any given year, but the extent to which data was missing is a limitation and no comparisons can be made between students graduating from the same high school in one year versus another. Undergraduate G.P.A. for students that did not graduate was



also not available so some factors may have been more significant in some of the models had I been able to predict G.P.A. among graduating and non-graduating students.

As an applied sociologist I believe in Auguste Comte's (1865) political positivism, the policy implications of this research are of prime importance. For a private university, increasing retention and students success without decreasing enrollment is the principal goal of institutional researchers. Advisors could be specially trained and assigned to students from lower income families, lower income schools, and those entering the university with less educated parents. For many students, advisors are the first contact a student will have with the university bureaucracy. Professionals, who are trained to work with students from disadvantaged backgrounds, could assist students, who are less familiar with the educational institution, from enrolling in classes that may be prove too challenging for the first semester, and provide additional information and support. Baylor has recently instituted a warning system for students who enter the university with academic red flags, such as low G.P.A. or low standardized test scores that allows faculty, advisors, and tutors to recognize problems with student performance early in the first semester. The program appears to be having a positive impact on the small number of students that are a part of it. Expanding that warning system to include students from lower income high schools, or students with average grades from high risk schools may allow the staff to effectively target a larger population without increasing staff exponentially.

Stratification, culture, and mobility are the cornerstones of sociological research and understanding how education impacts, is impacted and interacts with those concepts is key to understanding our society. If we, as scholars, can understand how, why and

when students will succeed in the educational marketplace, we can curve the risk and potentially increase the success of students by targeting them early in their educational careers and equalize the social playing field. The effects of institutional data in theses analyses appear to be random, but we, as researchers, cannot exclude institutional variables from future consideration as they may prove to be significantly more important in samples from a wider range of institutions and samples with more heterogeneity.

Lastly, I will pursue three papers as a result of this dissertation research. The first paper will be focused on the G.P.A. analysis with cross-level interactions using income data. A second paper will focus on the retention analysis and the differences between those who finish their college degrees and those who fail to secure a bachelor's degree. The third paper will use the data and literature collected for this study to analyze the effect of religious affiliation on student success and retention. Christian universities have a significantly higher retention rate than secular universities and I am interested in whether this is potentially a result of higher cultural tension, as Christian universities tend to eschew some of the negative and distracting elements of mainstream college life, or whether it is an indicator of stronger student relationships and higher buy in with the university and the university mission.

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