

FACTORS AFFECTING THE PERSISTENCE AND GRADUATION OF TRANSFER  
STUDENTS: AN EVENT HISTORY ANALYSIS

by

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(Under the Direction of Scott Thomas)

ABSTRACT

This dissertation provides a better understanding of the persistence to graduation of two-year college transfer students. To achieve this objective, a prediction model was developed to assess the influences of the factors associated with the timing of graduation of two-year college transfer students. This model was developed using event history analysis. The model's key independent variables include gender, race, socioeconomic status, number of previous institutions attended, percent of courses that did not transfer, two-year college GPA, GPA at the four-year institution and financial aid. The two time-dependent variables are financial aid and GPA at the four-year institution. This study found that the factors that seem to have a more significant impact on persistence to graduation are all academic related. The findings indicate a need for intrusive interventions that will allow institutions to identify students who lack the necessary academic preparation to succeed in a four-year institution early on. This proactive approach will enhance the students' chances of persistence to graduation.

INDEX WORDS: Transfer students, persistence, event history, baccalaureate attainment, graduation.

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## CHAPTER 1: BACCALAUREATE ATTAINMENT AND THE FOCUS OF THIS RESEARCH

### Introduction

This study examined the persistence to graduation rates of two-year college transfer students. Of specific interest are: 1) the overall rate of success evidenced by grade performance and persistence to graduation, and 2) differences on these measures by race, socioeconomic status and gender.

Enrollment in community colleges has grown steadily over the years, and the number of students attending two-year colleges is projected to go beyond the enrollment at public four-year institutions (see Figure 1.1). The fact that community colleges promote access to higher education by having an open admissions policy, and are less expensive than their four-year counterparts, makes them an attractive option for those potential students who otherwise would not pursue a postsecondary education.

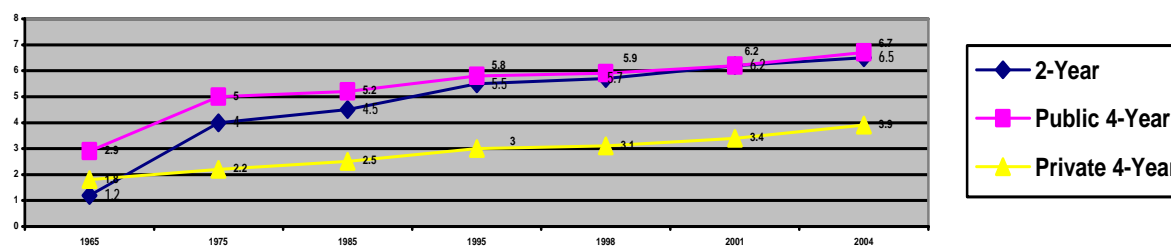


Figure 1.1 Total Fall Enrollment in Postsecondary Education (in millions).  
Source: National Center for Education Statistics, 2005, table 171

For a growing number of students, the community college is the gateway to obtaining a bachelor's degree. Cohen and Brawer (2003) state that one of the major objectives of community colleges has been to admit students out of high school, provide them with the first two years of college, and send them to a four year institution to complete their baccalaureate degree.

Wellman (2002) states that the transfer function is critical to the success of postsecondary education. She explains:

The 2/4 community college-baccalaureate transfer function is one of the most important state policy issues in higher education because its success (or failure) is central to many dimensions of state higher education performance, including access, equity, affordability, cost effectiveness, degree productivity, and quality. States that have strong 2/4 transfer performance will have lower state appropriations per degree. They will also do a better job of translating access into success and of reducing the achievement disparities that prevent low-income and minority students from obtaining the baccalaureate degree. (p.3)

Data from the National Center for Education Statistics' Baccalaureate and Beyond Longitudinal Study - a representative sample of baccalaureate recipients in 1992 - show that 49 percent of baccalaureate recipients attended a community college. Of those baccalaureate recipients who attended a community college, 44 percent were traditional two to four year transfer students who began their undergraduate studies at a community college and then transferred to a four-year institution to complete their baccalaureate degree (McPhee, 2006).

In the Southeastern region of the United States, 42 percent of first-time freshmen enrolled in two-year colleges do not return for a second year of education, while only 12 percent of their counterparts in four-year institutions fail to return for a second year after matriculation (SREB

Fact Book 2007, Table 39). ACT research shows that nationally 46.7 percent of students enrolled in two-year colleges fail to return for a second year of education, while 26 percent of their counterparts in four-year public colleges do not return for a second year after matriculation (ACT, 2006).

Regarding graduation rates, 52 percent of students enrolling as first-time freshmen complete their bachelor degrees within six years or less, and only 17 percent of freshmen at two-year colleges complete their associate degree in three years or less (SREB Fact Book 2007, Table 39). National figures show that 28.9 percent of students at two-year colleges complete their associate degrees in three years or less. In four-year colleges, the graduation rates vary according to whether they are private or public institutions. Private four-year colleges graduate 56.7 percent of their students in five years or less, while public four-year colleges graduate 39.6 percent of their students in five years or less (ACT, 2006). Little is known however, about the retention and graduation rates of students once they transfer to a four-year institution. While the federal government collects through the Integrated Postsecondary Education Data System (IPEDS) the retention and graduation rates of students who start and complete their studies in a single institution only, information about students who transfer to other institutions is an optional element in IPEDS. These data therefore are not systematically collected. In this context the issue of persistence and graduation of students who transfer from a two-year to a four-year institution becomes an important focus for research.

### The Importance of Baccalaureate Attainment

A large body of literature indicates that realization of a middle-class lifestyle is affected by the completion of post-secondary education (Whitaker & Pascarella, 1994; Pascarella & Terenzini, 1991; Cohen & Brawer, 2003). Studies show that those with an Associates degree

earn 20 percent to 30 percent more than a high-school graduate, and an individual with a bachelor's degree will earn 40 percent more income than a high-school graduate (Carnevale and Desrochers, 2003). Between 1980 and 2004, those with at least a bachelor's degree enjoyed higher median earnings than those with less education. In 1980, males with a bachelor's degree or higher earned 19 percent more than males with less education; in 2004 they earned 67 percent more (National Center for Education Statistics, 2006, Table 22-1).

The contribution of educational attainment to economic growth and well-being has typically focused on labor market returns. However, its social effects are as important as its market outcomes. Studies have found that a high level of education reduces the probability of receiving transfer benefits, either disability-related benefits or welfare (Antel, 1988; An, Haveman, & Wolfe, 1993). There is also some indication that criminal activity decreases as educational level increases (Yamada, Yamada & Kang, 1991). The educational attainment level of the next generation is intrinsically linked to the parents' years of education. There is substantial evidence to support the premise that a child's educational attainment is positively related to the parents' education (Ermisch & Francesconi, 2000; Haveman & Wolfe, 1984; Duncan, 1994).

Given the impact that educational attainment has on society and on a prospective student's potential income, it is imperative that faculty, administrators, and policy makers have a better understanding of the factors that affect baccalaureate degree completion, especially for students from historically underrepresented groups.

#### The Role of the Two-Year College in Baccalaureate Attainment

Supporters of community colleges suggest that students who transfer from a two-year to a four-year institution suffer no disadvantage related to degree completion. Adelman (2006) found

that those who are classic transfer students (those who transferred from a community college to a four-year institution earning more than ten credits from the community college), have a 21 percent higher probability of earning a bachelor's degree (p.67). Surette (1997) concluded that attending a two-year school provided a valuable link between high-school and attendance at a four-year college. He also maintained that the number of two-year college credits accumulated has a positive impact on the probability of attending a four-year college. Lee, Mackie-Lewis and Marks (1993) established that six years after graduating from high-school, community college students who transferred to a four-year college were no different than those who started in a four-year institution in terms of persistence and graduation rates. Roksa (2006) determined that the vocational nature of community colleges does not have a negative effect on earning an associate degree, transferring to a four-year institution, and earning a bachelor's degree. Chapa and Schink (2006) concluded that community colleges in California help Latinos advance in society. This is reflected by the increased Latino enrollments and transfers to California State University campuses.

Critics of community colleges have found that two-year college entrants experience significantly lower levels of overall educational attainment than those individuals who started at a four-year college (Alba & Lavin, 1981; Velez, 1985, Pascarella and Terenzini, 2005). Others argue that community colleges, due to their emphasis on non-academic vocational education, divert students from pursuing a baccalaureate degree (Clark, 1960; Brint and Karabel, 1989; Monk-Turner, 1995).

Grubb (1991) explains that between the high school graduating classes of 1972 and 1980 the success of transfer students in receiving baccalaureate degrees dropped significantly. In the National Longitudinal Study of 1972, over 40 percent of students who received an Associate in

Arts degree also received a bachelor's degree in four years; in *High School & Beyond* the number fell to just over 12 percent. Pascarella and Terenzini (2005) concluded that even after controlling for a variety of characteristics, individuals who started their postsecondary education in a two-year college reduced their probability of completing a bachelor's degree by 15 to 20 percent.

These studies seem to indicate that the lower level of bachelor's degree attainment among two-year college students is due to factors other than just their student demographics. Dougherty (1992) asserts that this attainment gap is attributable to structural/institutional barriers such as academic preparation, financial aid, and difficulty transferring credits. He contends that due to their open admissions policy, community colleges attract less academically prepared students who struggle to persist. Dougherty (1992) also states that transfer students sometimes have trouble adapting to a four year college environment which coupled with difficulty in getting their credits transferred makes it less likely that transfer students will persist and graduate. The availability of financial aid is also a significant barrier. For example, the Pell Grant was designed to ensure access to higher education for low income families. However, even with increases in the value of the Pell Grant maximum award, students from low income families face historically high levels of remaining expenses (the difference between the total cost of college minus the maximum Pell award) (Advisory Committee on Student Financial Assistance, 2002). This financial barrier is less of an issue at two-year colleges but it becomes a major factor after transfer to a four-year institution.

The Western States Commission for Higher Education (WICHE) has projected an expansion in the number of high-school graduates, which will reach its peak in 2007-08. Between 2008-09 and 2014-15, the production of high-school graduates will be moderately slow.



These projections show that while the number of high-school graduates will become more stable there will be substantial differences among states. For example, states such as Kansas and South Dakota will see losses of ten percent or more, while other states such as Texas and Georgia will see increases of over twenty percent. Between 2007-08 and 2021-22, the West will see a five percent increase in the number of high-school graduates, while the South will see a growth of ten percent (WICHE, 2008).

WICHE (2008) has also projected an increased diversity of high-school graduates from all regions of the country driven by the increase of Hispanic and Asian/Pacific Islanders graduates, and the decrease of White non-Hispanic ones. The bulk of the increases are concentrated in the West, where the class of 2010 is projected to be the first class with less than fifty percent of graduates being White non-Hispanic, and the South, which will see its first graduating class with less than fifty percent of graduates being White non-Hispanic in 2017. This dramatic shift in the racial/ethnic composition of high-school graduating classes presents some challenges for postsecondary institutions in terms of curriculum, support services, and affordability as these student populations tend to be less academically prepared and hail from middle and lower income families.

#### The Setting for this Study

The site of this study is a regional institution in the State of Alabama which offers a variety of undergraduate, masters, doctoral and first professional degrees. In the 2006 fall semester this institution had an enrollment of over 13,000 students, making it the fifth largest of the fourteen four-year institutions in the state. On average, ten percent of the students who transfer during the fall semester from a two-year public institution to a four-year public

institution in the State of Alabama attend this particular university (Alabama Commission on Higher Education, Statistical Abstracts, 2002-2006).

#### Statement of the problem

With their open admissions policies and lower costs, community colleges are a key access point to higher education for underserved populations (Cohen and Brawer, 2003). In general, students who attend community colleges are more likely to be female, to hail from low income families and be older than students attending four-year colleges and universities (National Center for Education Statistics, 2006). However, in spite of this apparent opportunity for wider access to higher education, gaps in college participation and success at both two-year and four-year levels persist across race, gender, and class categories.

The SREB Fact Book 2007 states that 63 percent of undergraduates in four-year public institutions in the United States in 2004 did not have enough money to cover the cost of college. These students come from middle to lower income families. The proportion of annual household income needed to attend college varies significantly by income group. For example, for students from households in the highest fifth of incomes, one year's costs were eight percent of their income while for students from households in the lowest fifth of incomes the cost was 125% of the household's annual income (SREB Fact Book 2007, Table 51).

While the numbers of minority students enrolling in college has increased, there are still some substantial gaps in participation. For example, only 25 percent of Hispanics between 18-25 years of age enroll in college. This rate of participation falls behind that of African-Americans (33 percent) and whites (43 percent) (SREB Fact Book, 2007).

The graduation rate for the 1999 cohort of first-time full time degree seeking students in the State of Alabama is 49 percent, five percentage points below the national rate (SREB Fact

Book 2007, Table 39). The graduation rate for the 1999 cohort of the university being used for this study is 33 percent (Office of Institutional Research, 2006), more than ten percentage points below the state's graduation rate. The Alabama Commission of Higher Education publishes statistics reflecting the number of students who transfer to all two-year and four-year colleges in Alabama. However, relatively little is known about the completion rate of community college students who transfer to four-year public institutions. During the 2001-2002 academic year, the Articulation and General Studies Committee (AGSC) hired a consulting firm to evaluate the impact of the state's articulation program on higher education in Alabama. One of the consultants' recommendations states:

The AGSC needs to conduct a carefully designed study to evaluate the [academic] success of community college students who transfer to state universities. Much useful information could be gained from a well-designed study evaluating the success of transfer students. Information about factors affecting student success might provide useful feedback to community colleges and have important implications for the general studies curriculum. [As the cost of higher education continues to rise in Alabama, the on-going evaluation] of the effectiveness of academic programs should be a primary goal (Crump, O'Neil and Wilds, 2002, p. 40).

This study addresses this call and provides information related to the factors that influence the persistence to graduation of community college students who transfer to a four-year regional institution in the State of Alabama. The results of this study may be used as a guide for future studies on the success of community college transfer students in other Alabama four-year universities, as well as other regional institutions around the country.

### Purpose Statement

The purpose of this study is to determine the factors that affect the persistence to graduation of community college students who transfer to a four-year institution.

The following research questions form the basis for this study:

- 1) How does financial aid affect the timing of graduation?
- 2) How does academic performance at the four-year institution affect the timing of graduation?
- 3) To what extent does race, socioeconomic status, or gender affect the timing of graduation?
- 4) How does academic performance at the community college affect the timing of graduation?

### Significance of the Study

In studying educational attainment, researchers and policy makers view students' completion of a baccalaureate degree as a key indicator of postsecondary educational success and as an important measure of institutional performance and accountability (Measuring Up 2006).

While much is known about the factors affecting the success and graduation of native students – those students who start and complete their studies in one institution - (Adelman, 2006; Tinto, 1987; Pascarella and Terenzini, 2005), much less is known about the success of transfer students. Data regarding the retention and graduation rates of transfer students is not readily available.

This study is important because it will help identify the factors that affect the persistence to graduation of transfer students, so that faculty, administrators, and policy makers will expand

their understanding of this process, which will help them develop better policies, programs, and services to serve the needs of this particular segment of the student population.

## CHAPTER 2: LITERATURE REVIEW

### Introduction

The purpose of this study is to determine the factors that affect the persistence to graduation of community college students who transfer to a four-year institution.

The following research questions guide this study:

- 5) How does financial aid affect the timing of graduation?
- 6) How does academic performance at the four-year institution affect the timing of graduation?
- 7) To what extent does race, socioeconomic status, or gender affect the timing of graduation?
- 8) How does academic performance at the community college affect the timing of graduation?

This review of the literature is divided into two sections. The first section describes the structural barriers to bachelor degree attainment with emphasis on aspirations, academic preparation, and college affordability. The second section examines three theories of college departure: the Sociological Model of Student Departure by Tinto (1975), the Industrial Model of Student Attrition by Bean (1980), and the Conceptual Model of Undergraduate Socialization by Weidman (1989).

### Structural Barriers

The importance of educational attainment to economic growth and well-being along with its benefits to society is clearly documented (Paulsen, 2001; Whitaker and Pascarella, 1994; Carnavale and Desrochers, 2003; Antel, 1988; An, Haveman, & Wolfe, 1993). Therefore, it is

not surprising that a large amount of research has been undertaken to determine the factors that influence baccalaureate attainment.

Aspirations, academic preparation, and college affordability are three of the factors that have an impact on educational attainment. The following sections will discuss the nature of these factors as well as their importance to bachelor degree attainment.

### *Aspirations*

In order to understand the nature of college aspirations, it is important to distinguish between aspirations and expectations. Aspirations and expectations are conceptually similar, but educational aspirations are understood to reflect some degree of hopefulness beyond what individuals realistically expect to achieve (Mickelson, 1990). Aspirations are somewhat abstract representing idealistic preferences for the future. College aspirations may reflect students' understanding of the importance of a college education rather than their desire to attend college (St. Hilaire, 2002).

In comparison to aspirations, expectations are a more realistic assessment of one's educational future (Mickelson, 1989). When aspirations and expectations are compared, expectations are usually lower than aspirations (Hanson, 1994; St.Hilaire, 2002). The difference in expectations and aspirations is exemplified in the findings that African American children have significantly higher aspirations than whites do (Hauser and Anderson, 1991); however, their expectations are generally lower (Morgan, 1996).

College aspirations have been described by several researchers as being key for educational attainment (Perna and Thomas, 2006; Adelman, 2006; Pascarella, 1984).

McDonough (1997) argues that college aspirations are influenced by several factors such as

cultural capital and habitus. To fully comprehend how aspirations affect educational attainment, it is important to understand the following concepts: cultural capital, habitus and social capital.

### *Cultural capital*

Cultural capital refers to the set of values, norms, beliefs, and attitudes that influence an individual. These influences come from family, friends and acquaintances. McDonough (1997) asserts that “parents transmit cultural capital by informing offspring about the value and process for securing a college education, and its potential for conversion in the occupational attainment contest.” (p.9). This cultural capital is bounded by social class, which is associated with inequities in educational attainment. In general, degree aspirations increase across socio-economic levels (SES), with students from higher socio-economic backgrounds attending better quality institutions and aspiring to a four-year degree in higher numbers than their lower SES counterparts (Cabrera, La Nasa, and Burkum, 2001; DiMaggio, 1982; Hearn, 1984; McDonough, 1997; Walpole, 2003).

### *Habitus*

Aspirations are also influenced by *habitus*, which is the accumulation of past experience affected by class socialization, actions, and observations (Bourdieu and Passeron, 1977). The formation of these aspirations can be understood by considering the school context and the degree of parental involvement as the student gets closer to high-school graduation. McDonough (1997) asserts that while students’ aspirations are partially influenced by the habitus of their socioeconomic class as communicated by their families and communities, she also argues that they are influenced by the organizational habitus of their high schools. This habitus affects the options that college counselors communicate to their students thus limiting students’ college choice options. Habitus is a product of the culture, defined as the values an organization



communicates around college attendance, and the climate, exemplified by the patterns of college going that the culture creates. The effects of habitus are manifest in the trends of college choice across schools serving similar socioeconomic status groups. In general, students from lower socioeconomic backgrounds and first-generation students are at a disadvantage when it comes to the messages that emanate from their high schools' habitus. These students generally attend crowded schools with low levels of funding that offer limited academic and college counseling opportunities (Rendon and Hope, 1996; McDonough, 1997, Perna, Rowan-Kenyon, Thomas, Bell, Anderson and Li, 2008). Students that come from school-based climates with poor academics, limited use of a school counselor and little or no sense of entitlement to a college education are most likely to attend a two-year college or not consider college as an option (McDonough, 1997; Cabrera, LaNasa & Burkum, 2001).

### *Social capital*

The level of parental involvement in the transmission of social capital and its influence on college aspirations has been thoroughly examined in the literature (Perna & Titus, 2005, Hubbard, 1999; Chenoweth & Galliher, 2004; Somers, 2002; Tierney, 2002; Auerbach, 2004). Stanton-Salazar (1997) defines social capital as the relationships with institutional agents that can be converted into socially valued resources and opportunities.

These relationships help to form social networks that enable individuals to secure their successful participation in the mainstream of society. These social networks can reproduce race and social class inequalities because some are able to access these networks while others are not. Research in adult social networks shows that the structure of networks of people from different social classes results in different access to opportunities and privileges (Wellman & Berkowitz, 1988; Lin, 1990). Working-class students attend schools that do not foster the development of

supportive social networks; therefore, these schools play a role in reproducing social inequality (Stanton-Salazar, 1997).

Parental involvement has proven beneficial to the formation of college aspirations (Perna, 1995; Horn & Chen, 1995, Tierney, 2002). This is particularly important for minority and low-income students who have access to limited resources that promote college enrollment (Cooper, 2002; Gandara, 2002; Gonzales, Stone & Jovel, 2003; Auerbach, 2004; Perna & Titus, 2005). Studies show that parents who are involved in their children's school, encourage educational activities at home, and engage in conversations with their children regarding college, exert a significant influence on their children's college aspirations and choice (Gutman & McLloyd, 2000; Cabrera & LaNasa, 2000; Perna & Titus, 2005). Parental involvement can be conceptualized as a form of social capital, which allows individuals access to resources needed for college attendance (Perna & Titus, 2005). Parents foster their children's involvement or membership in particular groups thus allowing them access to beneficial social networks. These networks give individuals the opportunity to surround themselves with people that exhibit behaviors, which help shape expectations, attitudes, and aspirations.

While most of this literature is based on high-school students, parallels to community college students are not hard to find. For example, community college students are more likely to be older, female, Black or Hispanic, and from low-income families compared to their four-year college counterparts (Horn, Neville & Griffin, 2006). It could be argued that because these students hail from lower socio-economic backgrounds their experiences related to the formation of college aspirations follow a similar pattern than those from high-school students from the same social class.

The lack of college aspirations among some community college students might help explain the low community college graduation rates. Horn et al (2006) found that at least two-thirds of community college students enrolled in degree programs did not intend to graduate. The authors speculate that these students might not know what they want to accomplish in college or have the academic preparation needed to complete a degree.

This section has addressed the importance of aspirations to educational attainment. The discussion has made it clear that not all individuals face equal choices because they start out with different family and school resources. When a student's habitus, cultural and social capitals help determine that college attendance is possible, the student develops a sense of entitlement without which bachelor degree attainment is hard to obtain.

Academic preparation is another structural barrier that precludes individuals from successfully completing a college degree. What follows is a discussion on the impact academic preparation has on bachelor degree attainment.

#### *Academic Preparation*

The academic preparation of high-school students has a considerable effect on their chances of attending a postsecondary institution and persisting until graduation. A study by the Horn, Kojahu, and Carroll (2001) concluded that those students who completed a rigorous high-school curriculum were more likely to persist and obtain a bachelor's degree than their counterparts taking a less rigorous curriculum. A rigorous curriculum was identified as one which includes 4 years of English, 3 years of a foreign language, 3 years of social studies, 4 years of mathematics (including pre-calculus or higher), 3 years of science (including biology, chemistry and physics), and at least one Advanced Placement course or AP test. Horn, Kojahu and Carroll (2001) also found that the type of high-school curriculum students complete is

dependent on family background and socioeconomic characteristics, such as family income, parents' education, and race/ethnicity. The students' socioeconomic indicators (income and parents' education) and the level of academic curriculum students completed showed a positive association. That is, with each successive level of income and parental education, the likelihood of completing a rigorous curriculum increased. With regard to race, 31 percent of Asian/Pacific Islanders indicated they had completed a rigorous curriculum, followed by White non-Hispanic (19.7%), Hispanic (16.2%), and Black non-Hispanic (8.1%) (Horn et al, 2001). Similar conclusions are drawn by Adelman (2006), as he asserts that the academic intensity of the high-school curriculum is a strong influence on bachelor degree completion. He also established that Latino and African-American students, and those in any socioeconomic quintile other than the highest have limited access to the mathematics high school courses needed for bachelor degree attainment (Adelman, 2006, Table 6).

The organizational habitus of the high schools these students attend have a direct impact on their educational aspirations. Organizational habitus is linked to socio-economic status (McDonough, 1997), which means that high schools who serve students from higher socioeconomic levels tend to offer a more academically rigorous curriculum. These offerings are in response to the expectations that parents and students place on the high school.

In recent years, it has become evident that taking the right number of core courses in high school is not sufficient preparation for postsecondary education (Dougherty, Mellor, & Jian, 2006). ACT (2007) research has found that of the 2006 ACT tested high school graduates who took a core curriculum, comprised of at least four years of English, at least three years of mathematics, at least three years of social studies, and at least three years of natural sciences, only 26 percent were ready for college level courses in all four areas. In fact, the ACT (2007)

report called “*Rigor at Risk*” concluded that even taking additional high-school courses in the different core areas did not substantially improve the students’ readiness for college.

Researchers (Adelman, 2006; Sommerville & Yi, 2002) agree that the quality of the core curriculum being offered by high schools is jeopardizing the students’ transition between high school and college.

It appears that college readiness is being affected by several misalignments in the educational system (ACT, 2007). For example, state standards for obtaining a high-school diploma do not necessarily specify which courses students should take as prerequisites for high-school graduation. In fact, only over half of the states require students to take any mathematics courses in order to graduate (ACT, 2007). Of the 26 states that have mathematics requirements for graduation only 12 require math courses beyond Algebra II. Research shows that Algebra II is integral to a student’s ability to succeed in college-level work (ACT, 2004, Hallinan, 2002). What compounds this problem even further is the fact that the content of courses is not uniform. An Algebra I course in two different high schools could cover different material even if it has the same name, and there is no guarantee that either course meets the demands of either a four-year or a two-year college.

There is no doubt that a rigorous academic preparation is essential for college success (Cabrera and LaNasa, 2001; Adelman, 2006), especially when one considers that those with a good academic preparation have a 30 percent chance of getting a baccalaureate degree regardless of where they started their postsecondary education (Cabrera & LaNasa, 2001). The National Center for Education Statistics (2001) reports that over 90% of two-year colleges offer some form of a developmental studies program. The main objective of such a program is to help academically under-prepared students so they can persist and graduate (Boylan, Bonham, &

White, 1991). Given this situation, access to a good academic preparation becomes of critical importance. Research shows that access to valuable academic resources varies according to a student's socioeconomic status, with 25 percent of all lowest SES students having access to high academic resources and 59 percent of all highest SES students have access to similar academic resources (Cabrera & LaNasa, 2001).

The Measuring Up 2006 report has concluded that pre-collegiate preparation for college in the United States has improved, in the last ten years. There are more high-school students taking upper-level math and science courses than ten years ago, but improvements are not evenly distributed among all states. For example, pre-collegiate preparation in the State of Alabama has improved but it is still substandard. The state of Alabama is the lowest performing state in the percentage of low-income 8<sup>th</sup> graders scoring at or above "proficient" on the national assessment exam in math. Very small numbers of 11<sup>th</sup> and 12<sup>th</sup> graders score well in Advanced Placement tests, and in general Alabama 8<sup>th</sup> graders perform poorly in all national assessments (math, science, reading and writing), indicating their poor preparation for a rigorous high-school curriculum.

The academic preparation of community college students is of particular interest to this dissertation. While community colleges have been praised for their open access, they have also been criticized for their lack of academic rigor (Brint & Karabel, 1989; McGrath & Spear, 1991). Some argue that even though community college transfer students and native four-year college students have similar ability levels (Easton, 1994; Palmer, 1994), their performance in standardized tests is below that of their four-year college counterparts (Dougherty, 1994). This has led to the claim that community colleges are not succeeding in the task of preparing their students for transfer to a four-year institution. Others point at the decline in the GPA of

community college transfer students during their first semester at the four-year college (Diaz, 1992; Keeley, 1993; Cejda & Kaylor, 1997; Hall 2005) as proof of community college students' lack of academic preparation.

There are others who argue that attending a community college before transferring to a four-year college does not adversely affect bachelor degree attainment (Adelman, 2006; Lee, Mackie-Lewis and Marks, 1993; Roksa, 2006; Chapa & Schink, 2006). However, research shows that regardless of where students start their postsecondary education, their chances of obtaining a baccalaureate degree are greatly increased by a rigorous academic preparation (Cabrera & LaNasa, 2001).

There is no doubt that the lack of a demanding academic preparation is detrimental to persistence and graduation. The debate regarding the quality of the academic preparation provided by community colleges will continue, as there are a variety of conflicting findings that do not allow for any meaningful conclusions.

The discussion above points toward the fact that students do not have equal access to a good academic preparation. Not everybody benefits from an organizational habitus, in high school or in a community college, which supports the preparation needed for college success. The differences in access to a rigorous curriculum are determined by socioeconomic status. It has been previously established that community college students are more likely to be minorities from low-income families when compared with those attending four-year colleges (Horn et.al. 2006). This means that the lack of academic preparation has a more severe effect on those who need it the most. It could be argued that race and social class inequalities are perpetuated by the organizational habitus espoused by those institutions that do not provide the structure and resources needed for college preparation.

### *Affordability*

Affordability and the availability of sufficient financial aid is another structural barrier to educational attainment. The Advisory Committee on Student Financial Assistance has studied the effect that increases in tuition costs have on low-income students. Their 2002 report titled *Empty Promises* (2002) states:

Most Americans believe that all students have the opportunity to earn a college degree through hard work in high school and college. Yet, this year alone due to record high financial aid barriers, nearly one-half of all college qualified, low and moderate income high-school graduates – over 400,000 students fully prepared to attend a four-year college – will not be able to do so, and 170,000 of these students will attend no college at all.(p.27)

Since the early 1980s, the increase in the cost of college tuition has outpaced price increases in other areas of the economy. While tuition and fees have increased by 375 percent, the median family income increased by 127 percent (Measuring Up 2006). In the State of Alabama, affordability is a significant barrier to educational attainment. Families in Alabama devote a large share of their income, after financial aid, so their sons and daughters can attend public two and four-year colleges. Students, who attend community colleges, must spend 24 percent of the average family income for college related expenses, while those attending public four-year colleges must spend 26 percent of their income for college related expenses. This data compares unfavorably with more affordable states where the percentages of family income spent on college related expenses for community college and four-year college attendees are 15 percent and 16 percent respectively (Measuring Up 2006 – Alabama). The figures presented by the SREB Fact Book 2007 provide an even grimmer view of the affordability gap in Alabama.



The percent of median family income required to pay the median annual tuition and fees at four-year universities in Alabama for the lowest fifth of incomes has increased from 31.5 percent in 2000-01 to 44.7 percent in 2005-06 (SREB Fact Book 2007, Table 51). During the same time period, the percent of family income required by the highest fifth of incomes increased 1 percent to 4 percent (SREB Fact Book 2007, Table 51).

This affordability gap disproportionately affects poor and working class students (Paulsen and St John, 2002). In general, students from low-income and lower-middle income families are more responsive to tuition changes by reducing their probability to persist by 16 percent and 19 percent respectively (Paulsen and St. John, 2002).

The SREB Fact Book 2007 states that 63 percent of undergraduates in four-year public institutions in the United States in 2004 did not have enough money to cover the cost of college. These students come from middle to lower income families. The proportion of annual household income needed to attend college varies significantly by income group. For example, for students from households in the highest fifth of incomes, one year's costs were 8 percent of income while for students from households in the lowest fifth of incomes the cost was 125 percent of the household's annual income (SREB Fact Book 2007, Table 51).

The impact of finances on college choice and persistence indicates that those from poor and working-class backgrounds are significantly affected by the inadequacy of student financial aid (St. John, Paulsen & Starkey, 1996; Paulsen & St. John, 2002; St. John, Paulsen & Carter, 2005). This research shows that lower income students have inaccurate perceptions of college costs and the availability of financial aid. Even when they decide to attend low tuition colleges, the amount of aid they get, whether it be grants, loans or federal work-study is not sufficient to continue their studies. Paulsen and St .John (2002) also conclude that research in this area needs

to concentrate not on race alone but on race within social classes. They found patterns in the nexus of finances and persistence based on the different habitus of poor and elite classes. These findings mirror those of McDonough (1997) where the cost of college attendance played a different role in the college selection process of students from higher and lower SES backgrounds. Students from lower socioeconomic backgrounds considered it their responsibility to figure out a way to pay for college, while those from higher SES backgrounds perceived that their parents would be responsible for paying for college. These circumstances affected the list of institutions students would apply for admission.

Studies on the role that financial aid plays on persistence attempt to answer two questions: (1) does financial aid play a positive role in student persistence? And if so (2) which types of aid are most effective? Early studies (Murdock, 1987, 1990) found that financial aid plays a small but significant role in college persistence, especially for low-income and minority students. Others have found that financial aid in general has a positive effect on persistence (Jensen, 1981; Tekla 1985), and that the total amount of aid awarded plays a significant role on persistence (Somers, 1995).

Research on the effect of particular types of aid has yielded some inconclusive results. For example, Astin (1975) found that grants have a small but positive impact on retention, however Carroll (1987) claims that grant recipients drop out at lower rates but persistence rates as measured by credits completed do not respond to type or amount of aid. Paulsen and St. John (1997) assert that grant aid negatively affects persistence in public colleges but Murdock (1990) reveals that grants in combination with loans have the strongest impact on persistence. Astin (1975) and Herndon (1984) conclude that loans have a negative effect on persistence while Perna (1998) and Baker & Velez (1996) report that loans and persistence are positively correlated.

Work-study aid is the only type of aid that has been consistently reported as having a positive impact on persistence (McKenzie, 1998; Herndon, 1984, Olivas, 1986; Perna, 1998).

Several studies confirm that financial aid helps equalize opportunities for diverse groups (Cabrera, Nora & Castaneda, 1992; St. John, Hu & Weber, 2000; Stampen & Cabrera, 1988).

Nora (1990) reports that financial aid was the major factor in Hispanic community college student retention. Baker and Velez (1996) report that most forms of financial aid strengthen the persistence of minority students, with the exception of loans. In contrast to these studies, Murdock (1990) found that minority undergraduate students receiving financial aid had lower persistence rates than white recipients.

To understand the impact that financial aid has on students from lower socioeconomic backgrounds it is important to consider the changes in financial aid funding that have taken place the past few years. In 2006-07, about three-quarters of full-time undergraduates received some form of financial aid. Undergraduate students received \$97.1 billion in financial aid, 74 percent of total aid to postsecondary students. The two largest sources of aid to undergraduates are federal loans, which make up 40 percent of the total, and grants from colleges and universities, which comprise 21 percent of the total. Almost 60 percent of Pell Grant recipients were independent of their parents. Among dependent recipients of Pell Grants, two-thirds came from families with incomes below \$30,000. The average Pell Grant per recipient, which failed for the fourth year in a row to keep pace with inflation, was \$2,494 in 2006-07. In 1986-87, the maximum Pell Grant covered about 52 percent of the average published price of tuition and fees and room and board at a public four-year institution and 21 percent at the average private college. In 2006-07, it covered 32 percent at a public four-year college and 13 percent at a private college (College Board, 2007). Private loans made up 24 percent of total education loans

in 2006-07, up from 6 percent a decade ago. Federal loans to undergraduates did not keep up with inflation in 2006-07, and their borrowing from private sources increased by 12 percent in inflation-adjusted dollars. In 2003-04, 48 percent of low-income students borrowed an average of \$5,640 (in 2006 dollars) to help finance college. Among the wealthiest undergraduates, 36 percent borrowed an average of \$6,140 but the average loan amount of those who borrowed increased least for the wealthiest students (College Board, 2007).

The previous discussion illustrates that the financial aid system is not structured to provide support to those who are generally underrepresented in higher education. While grants seem to have a positive effect on retention, the Pell Grant does not provide sufficient funds to cover the cost of education. The increase in private loans due to the federal government's apparent move to privatize the financial aid sector points toward an alarming trend. This trend is particularly problematic for minority students who are not willing to take out loans to finance a college education (King, 1999).

### *Summary*

Baccalaureate degree completion is dependent upon students' academic preparation, access to adequate financial aid and the presence of the desire to complete a degree. The quality of the academic preparation of community college students has been called into question. Some argue that community colleges have lower expectations and do not provide their students with the appropriate resources to succeed in a four-year institution. This lack of academic preparation is presumed to negatively affect the transfer students' chances of persistence and graduation. A similar theme emerges when considering the academic performance of transfer students at the four-year institution. The literature on "transfer shock" alludes to the fact that this shock can potentially affect the students' persistence and graduation.

The important role that financial aid plays in student persistence has been well documented. There is less certainty regarding what type of aid has more impact on persistence; however, the only type of aid that has consistently shown a positive relationship with persistence is work-study aid. It is interesting to note that the largest source of federal aid is student loans, and that undergraduates have increased their borrowing from private sources. Studies show that without aid a significant percentage of academically prepared students are not able to attend college. Another importance point is that the high incidence of loans rather than grants is not an ideal situation for minorities and students from lower socioeconomic backgrounds as they tend not to apply for loans to cover the cost of their education.

The importance of parental involvement and school context in the development of college aspirations, especially for underrepresented students is critical to their future success in college. The literature establishes that not all students start on an equal footing because of differences in family and school resources. The research established that access to resources whether academic, financial or aspirations are dependent on race and socioeconomic status.

The analysis of the literature has revealed that undergraduate educational attainment can be helped or hindered by a combination of factors. These factors require a framework that will help professionals in higher education better understand the process of student persistence and educational attainment. To that end, three theoretical constructs that address student persistence are discussed in the next section of this chapter.

#### Theories of College Departure

Braxton, Brier, and Hossler (1988) contended that attrition research has fallen into one of two categories: atheoretical studies or theory-based studies. The atheoretical studies have been

primarily descriptive, and have not worked from models or theories to generate hypotheses to predict causal links among variables associated with college departure.

Although educators have conducted numerous studies, the research has suffered from methodological and definitional problems. Researchers have been inconsistent in how they have operationalized the terms “persister”, “completer”, “dropout”, “nondropout”, and “noncompleter.” Pantages and Creedon (1978) and Porter (1990) cautioned that in many early studies, authors defined persisters as students who obtained their degrees within four years from the college that was attended first. Some researchers included those students who were still enrolled at the end of the study. Others defined nondropouts as those who eventually graduated from college.

The major weaknesses of the early atheoretical studies were that they could only describe observations and present correlations between variables. They could not indicate causation. Many researchers recognized that the diversity of student background characteristics, and the students’ experiences added to the complexity of the problem (Astin, 1975). It became clear that no single factor explained college attrition and that students departing from college varied with respect to their pre-college attributes, reasons for attrition, and the probability of continuing their education later.

To address some of these deficiencies, several researchers began to develop theoretical frameworks to guide their examination of student attrition. These formal theories and models have included psychological theories that emphasize the impact of individual abilities and dispositions, societal theories that stress the importance of external factors, and economic theories that emphasize fiscal factors (Tinto, 1987).

### *Tinto's Sociological Model of Student Departure*

The most commonly referred to model in the student retention/departure literature is that of Vincent Tinto. The model hypothesizes that students enter college with pre-entry attributes that include family and individual characteristics as well as prior schooling. These pre-entry attributes influence the students' intentions and commitments, to finishing college and staying at their college. The students enter an academic system characterized by grade performance, intellectual development, and interaction with faculty and staff which together lead to academic integration. At the same time, the students enter a social system where extracurricular activities and peer group interactions lead to social integration. The central idea is that integration, both academic and social, work together to influence ongoing intentions and commitments, which in turn influence the decision to stay or leave college.

The theory underlying Tinto's model came from Spady (1971) who saw an analogy between suicide and dropping out of school. Spady argues that in both situations a person leaves a social system. Spady (1971) applied Durkheim's (1951) sociological model of suicide to the study of student attrition. Durkheim argued that some people committed suicide because they lacked the values of the social system in which they participated and because they were not supported by a group of friends. Tinto borrowed Spady's use of Durkheim's theory to identify the concepts of academic and social integration. In Tinto's model, a student who does not achieve a certain level of academic and social integration is likely to dropout of college.

Tinto's work provides a clear distinction between different modes of student departure. He argues that one of the major shortcomings of the research in this field is the lack of distinction between academic dismissal, voluntary withdrawal, and transfer to another institution.

Tinto asserts that “academic dismissal is most closely associated with grade performance; dropout in the form of voluntary withdrawal is not” (Tinto, 1975, p.116).

Tinto sees student departure as a longitudinal process, which is affected by a variety of factors at different points in time. This model indicates that students reevaluate the benefits of investing in a college education based on their background, experiences, and environment at a particular point in time.

Tinto’s is an institutional model rather than a systems model. Tinto insisted that his model was designed to inform policy development at the institutional level. He believes that an institutional level model is more useful at identifying and removing roadblocks to educational attainment than one characterizing exit from higher education in general.

Braxton, Sullivan and Johnson (1997) argue that 15 testable propositions can be derived from Tinto’s theory. Of these propositions, five are considered fundamental to the theory because they either have a direct impact on students’ persistence or provide strong links between the student and the institution’s academic and social environments. The five fundamental propositions are:

1. Student entry characteristics directly affect the student’s likelihood of persistence in college.
2. The greater the level of academic integration, the greater the level of subsequent commitment to the goal of graduation from college.
3. The greater the level of social integration, the greater the level of subsequent commitment to the institution.
4. The greater the level of subsequent commitment to the goal of college graduation, the greater the likelihood of student persistence in college.



5. The greater the level of subsequent commitment to the institution, the greater the likelihood of student persistence in college.

Braxton et. al. (1997) examined at length various studies that tested Tinto's propositions. These studies were conducted at multi-institutional sites, single institutions and in different types of institutions (i.e. two-year colleges, residential colleges, four-year colleges, etc.). Studies conducted at multi-institutional sites provide moderate empirical support to propositions one (Anderson, 1987; Pascarella and Chapman, 1983; Cabrera, Stampen and Hansen, 1990; Williamson and Cramer, 1988; Pavel, 1991, Stage and Rushin, 1993; Cash and Bissel, 1985), two (Braxton, Vesper, and Hossler, 1995; Munro, 1981; Cash and Bissel, 1985; Williamson and Creamer, 1988), three (Pascarella and Chapman, 1983; Munro, 1981; Braxton, Vesper, and Hossler, 1995; Pascarella, Smart, and Ethington, 1986), and five (Pascarella and Chapman, 1983; Cash and Bissel, 1985; Pascarella, Smart, and Ethington, 1986) and strong empirical support to proposition four (Anderson, 1987; Pascarella and Chapman, 1983). Single institution studies provide strong support for propositions three (Allen and Nelson, 1989; Allen, 1986; Cabrera, Castaneda, Nora and Hengstler, 1992; Cabrera, Nora and Castaneda, 1992; Pascarella and Terenzini, 1983; Stage, 1988) and five (Allen and Nelson, 1989; Brower, 1991; Pascarella and Terenzini, 1983; Terenzini, Lorang and Pascarella, 1981; Terenzini, Pascarella, Theophilides, and Lorang, 1985; Braxton, Brier and Hossler, 1988; Stage, 1988); moderate support for proposition two (Pascarella and Terenzini, 1983; Terenzini, Pascarella, Theophilides, and Lorang, 1985; Allen, 1986; Cabrera, Castaneda, Nora and Hengstler, 1992; Cabrera, Nora and Castaneda, 1992), and weak support for propositions one (Brower, 1992; Getzlaf, Sedlacek, Kearney, and Blackwell, 1984; Halpin, 1987; Voorhees, 1987; Nora, Attinasi, and Matonak,

1990, Allen, 1986 ), and four (Pascarella and Terenzini, 1983; Terenzini, Lorang, and Pascarella, 1981; Terenzini, Pascarella, Theophilides, and Lorang, 1985).

When exploring the empirical support for these propositions by institutional type, in studies using a multiple institution design, commuter universities and community colleges afforded strong support to proposition one. Community colleges provided moderate support to propositions two and three, while liberal arts colleges and community colleges afford strong support to proposition four. Proposition five, has strong support from residential universities, commuter universities, and liberal arts colleges but weak support from community colleges. It is important to mention that none of the propositions has strong support across all types of institutions.

Single institutional tests carried out in residential universities provide strong support to propositions three and five, and moderate support for propositions two and four. Commuter universities provided moderate support for propositions two, three, and five, while community colleges provided strong support to proposition one.

The magnitude of influence of these five fundamental propositions on persistence varies between multi-institutional and single institution studies. In general, multiple institution studies provide robust empirical support for the effect these propositions have on commitment to graduation, subsequent institutional commitment and student persistence.

It is important to note that Tinto asserts the suitability of his theory to single institution tests. In fact, Tinto's theory was designed to address the roadblocks to educational attainment at the institutional level. Following this line of thought, single institutional tests carried at residential universities provide the most robust empirical support to four of the five fundamental

propositions of Tinto's theory. Student characteristics seem to have a strong influence on persistence only in community colleges.

Tierney (1992), and Rendon, Jalomo and Nora (2000), discuss the suitability of Tinto's theory to the retention of minority students. Tierney (1992) argues that Tinto's interpretation of college attendance as a "rite of passage" ignores the fact that this concept explains the experiences within a culture. A rite of passage does not apply when an individual passes from one culture to another. This is especially important for minority students in predominantly white institutions.

Rendon et al (2000) place particular emphasis on the assumption of separation. Tinto argues that for students to fully achieve academic and social integration and hence college persistence, they must disassociate themselves from their culture. These researchers argue that this is a shortsighted approach that ignores the concepts of biculturalism and dual socialization. Rendon et al (2000) conclude that students should be encouraged to transit between cultures, and retention policies should support these efforts.

#### *Bean's Industrial Model of Student Attrition*

Bean's (1980) model was developed by applying Price's model of employee turnover in work organizations to student attrition. Bean's model included three types of variables, background variables such as socioeconomic status and past academic achievement; organizational variables such as college GPA and goal commitment; and intervening variables that included satisfaction and institutional commitment.

In Bean's model, satisfaction with being a student parallels job satisfaction in Price's model and is assumed to influence directly a student's decision to stay in college or drop. Since students are not paid for going to college, Bean developed a surrogate for Price's "pay" variable.

Bean believed it was imperative to include this proxy because in Price's model the "pay" variable exerted one of the most significant influences on job satisfaction. Bean's surrogates for pay were grades, practical value, development, and institutional quality.

Grades according to Spady (1970, p. 77) are "extrinsic and are used as tangible resources." This means that grades have a certain tangible value that could be used for future educational or occupational mobility and higher future earnings.

Practical value is related to the degree the students perceive their education will lead to future employment. A positive association was hypothesized between practical value and satisfaction because as the students perceive the enhanced future earnings of their college education the more satisfied they will be with their college experiences.

The third surrogate for pay was development. This variable relates to the degree to which students develop as individuals because of attending a particular college. Once again, this self-development is seen as an investment in the future, which will have a significant effect on future income.

The final surrogate for pay was described as institutional quality. This proxy is expressed as the degree to which the college is perceived as providing a good education. This variable is construed as providing a tangible benefit to the student in terms of future earnings.

Bean concluded that men and women leave college for different reasons, however past academic performance and institutional commitment were the strongest variables affecting student attrition.

It is interesting to note that Bean tested his model on a group of traditionally aged, White, first-time freshmen. This type of student is traditionally better academically prepared and hail from middle to higher income families. This context might help explain why background

variables such as socio-economic status were not significantly related to satisfaction, institutional commitment, or dropout.

*Weidman's Conceptual Model of Undergraduate Socialization*

Weidman's perspective on the analysis of college impact is built on the social structural aspects of socialization. Socialization occurs throughout life as individuals learn the norms of society and its subunits, as they move into the roles associated with the different stages of life, and as they move in and out of the different subgroups within society.

Weidman posits that the college experience has at least two significant socialization processes: one in which undergraduates learn about, and adjust to the college organization itself, and another in which students select, and prepare for the various life courses they might wish to pursue after leaving the college environment.

This model has two major characteristics. First, this model is designed to explain the processes through which college impact occurs, rather than what the specific effects of college might be. For example, Weidman's model is designed to explain the social processes through which student aspirations are maintained or changed (faculty-student interaction, membership in extramural organizations), rather than to explain what particular student aspirations are supported by a particular institutional mission. As such, the model defines reference groups and information sources that are most salient to undergraduates, such as parents, peers, and the structure of the college.

The second characteristic of Weidman's model is that it is primarily concerned with "non-cognitive Socialization Outcomes". These affective outcomes include values, aspirations, life-style preferences, and career choices. Weidman defends the value of these outcomes relative

to the more commonly studied variables related to cognitive knowledge and skills, and states that models that ignore the impact of affective outcomes on academic learning are simplistic.

This model is built on the perspective that what students become is both supported and bounded by the opportunities and constraints they encounter in their environment. For example, if the staff and structure of a two-year college do not support students in transferring to a four-year institution, a student will need to bring personal resources (such as perspectives developed through pre-college socializations, or encouragement gained through specific relationships during college) to bear in nurturing and even in creating an aspiration to transfer.

Weidman's model includes seven main components: (1) *Parental socialization*, including socio-economic status, life style, and parent-child relationships, is speculated to continue through the student's time in college. (2) *Non-college reference groups*, such as peers, employers, and community organizations combined with parental socialization are the main interpersonal influences on students. Students also bring with them (3) *background characteristics* such as socio-economic status, academic ability, career preferences, aspirations and values. These elements have an impact on the socialization processes they engage in.

Parental socialization, student background characteristic and non-college reference groups combine to form the student's (4) *pre-college normative pressure*. This pressure represents the socialization forces with which a student must continue to contend once he/she enters college. The *college experience* (5) is divided into academic and social normative contexts. Weidman used Tinto's (1975) work to guide the structure of this part of his model. The academic and social contexts have formal and informal socialization structures. For example, the major department is part of the formal socialization structure of the academic context, while the informal academic context consists of the "hidden curriculum" – the unstated

but consistent aspects of academic pursuits in each field of study. The socialization processes that occur within each of these contexts include interpersonal interaction, intrapersonal processes and social and academic integration.

*In-college normative pressure* (6) is the result of combining pre-college normative pressure with the college experience. This component highlights the impact of faculty norms on maintaining or changing students' career choices. The departmental climate and the way faculty interact with students is a crucial aspect of this normative pressure.

All six of these sources of socializing influence combine and interact with the student to produce (7) *socialization outcomes*. The outcomes Weidman's includes in his model are career choices, life-style preferences, aspirations, and values, although he explains that, the outcomes investigated using this model could vary according to a researcher's particular interests.

The review of these models indicates the existence of some common elements that affect the student departure process. All three models acknowledge the importance of background elements, such as socio-economic status, and academic preparation. They also suggest that the emphasis on the role of external factors in influencing college persistence provides us with an understanding of the college persistence process.

All models acknowledge the important role played by the academic and social environments. While each researcher conceptualizes these environments somewhat differently – Tinto asserts academic and social integration play a critical role in the decision to stay or leave college; Bean emphasizes satisfaction with these environments as the precursor for persistence, while Weidman draws attention to the socialization processes students encounter in both of these contexts – they all agree with the premise that these environments work together to influence the decision to stay or leave college.

## Summary

Many studies have attempted to test the theories of persistence described above. These studies point towards the importance of the causal relationships of precollege, institutional, and external variables on student persistence. The role of aspirations, academic preparation, and affordability is recognized in all the models discussed.

While all the models acknowledge the longitudinal nature of the student persistence process, they fail to address the temporal nature of the influence asserted by the variables. For example, it is of critical importance to the study of student persistence to ascertain not only when dropout is likely to occur but also the effect time-varying covariates such as financial aid and GPA have on dropout. The foundational work described above provides a roadmap to follow towards the development of a more comprehensive framework to understand the student persistence process.

Based on the review of the literature, a conceptual framework was established that provides the focus for this study of transfer students' persistence and graduation. The purpose of this study is to determine the factors that affect the persistence and graduation of students who transfer to a four-year institution. This was accomplished by studying the effect of selected variables on graduation. The selected variables represent demographics, academic background, financial aid awarded and socioeconomic status.

The conceptual framework and methodologies for examining the patterns of persistence and graduation of transfer students are presented in the next chapter.



## CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

### Introduction

The purpose of this chapter is to describe the methods that were used to determine the factors that affect the persistence to graduation of community college students who transfer to a four-year university. The following research questions form the basis of this study:

- 1) How does financial aid affect the timing of graduation?
- 2) How does academic performance at the four-year institution affect the timing of graduation?
- 3) To what extent does race, socioeconomic status, or gender affect the timing of graduation?
- 4) How does academic performance at the community college affect the timing of graduation?

This chapter is divided into four sections: (a) design of the study, (b) sample selection, (c) data collection and analysis, and (d) assumptions and limitations of the study.

### Design of the Study

The specific aim of this study is to assess the persistence to graduation of two-year college transfer students to a four-year university in the Southeast. To achieve this objective, a prediction model was developed to assess the influences of the factors associated with the timing of graduation of community college transfer students. This model was developed using event history analysis which allows for the study of multiple modes of departure (dropout, graduation), across a finite period of time.

The purpose of event history analysis is to explain why certain individuals are at a higher risk of experiencing the event(s) of interest than others. This can be accomplished by using special types of methods which, depending on the field in which they are applied, are called failure-time models, life-time models, survival models, transition-rate models, response-time models, event history models, duration models, or hazard models (Allison, 1984; Blossfeld & Rohwer, 2002; Yamaguchi, 1991). In this study, the terms event history, survival and hazard models will be used interchangeably.

A hazard model is a regression model in which the “risk” of experiencing an event at a certain point in time is predicted with a set of covariates. Two special features distinguish hazard models from other types of regression models. The first is that they make it possible to deal with right censored observations – cases for which the event does not occur by the end of the observation period. Another special feature is that covariates may change their value during the observation period. The possibility of including such time-varying covariates makes it possible to perform a truly dynamic analysis (DesJardins, 2003). Before discussing in more detail how hazard models can be used in the study of student persistence, it is important to introduce some important concepts and terminology.

In order to understand the nature of event history data and the purpose of event history analysis, it is important to understand the following concepts: state, event, duration, risk period, censoring, hazard and survivor functions. These concepts are illustrated below using an example from the analysis of student persistence.

The first step in the analysis of event histories is to define the states that one wishes to distinguish. States are the categories of the dependent variable that one wishes to explain. At every particular point in time, each individual occupies one state (Allison, 1984). In the analysis

of student persistence, four states are generally distinguished: enrolled, stop-out, dropout, graduation and re-enrollment after stop-out (DesJardins, Ahlburg, & McCall, 1999). The set of possible states is sometimes also called the state space.

An event is a transition from one state to another, that is, from an origin state to a destination state. In this context, a possible event is the transition from the origin state of being enrolled in college, to a destination state of graduation.

Another important concept is the risk period. Clearly, not all persons can experience each of the events under study at every point in time. To be able to experience a particular event, one must occupy the origin state defining event, that is, one must be at risk of the event concerned. The period that someone is at risk of a particular event is called the risk period. For example, someone can only experience dropout when he or she is enrolled in college. Thus, only students enrolled in college are at risk of dropping out. A strongly related concept is the risk set. The risk set at a particular point in time is formed by all individuals who are at risk of experiencing the event concerned at that point in time (Yamaguchi, 1991).

However, once the student has experienced the event, that student is no longer at risk of the event occurring and is removed from their risk set. This type of observation is called censored if it is known that it did not experience the event by the end of the observation period. In fact, censoring is a type of missing data. Suppose that for the student persistence example a student did not dropout by the end of the observation period, but it is not known whether or when he or she will dropout. This is an example of right censoring. The diagram below illustrates how Student B is a right censored case. This phenomenon has been shown to cause estimation problems such as severe bias or loss of information when standard regression techniques are used to estimate longitudinal events (Allison, 1984).

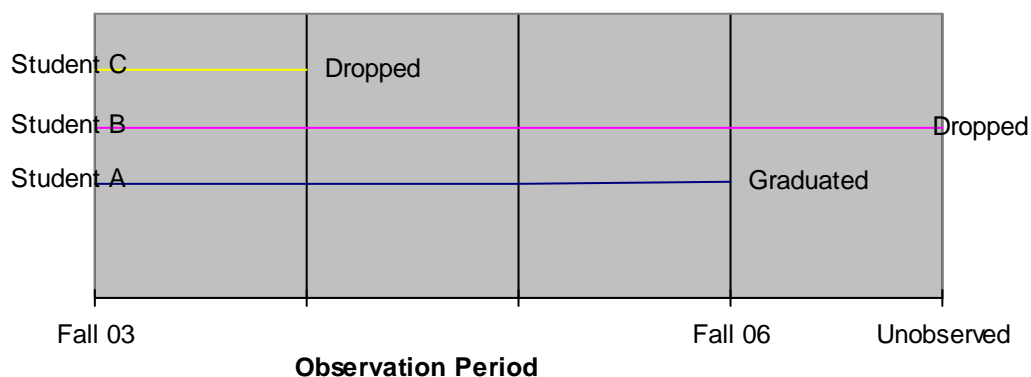


Figure 3.1 - Censoring

The hazard rate is “the probability that an event will occur at a particular time to a particular individual, given that the individual is at risk at the time” (Allison, 1984, p. 16). In the case of student persistence, the hazard rate would indicate the probability that the students who are still enrolled at a particular point in time will drop out of school. The survivor rate, on the other hand, is “the probability of not having the event of interest (dropout) occur at a particular time.” (DesJardins, 2003, p. 432). In Event History Analysis, the hazard rate is the primary dependent variable of interest. This is sometimes misunderstood in EHA, with readers often focusing on the occurrence of an event (or change of states from 0 to 1) rather than the actual hazard rate which is the true dependent variable. Hearn, McLendon, and Mokher (forthcoming) describe the hazard rate as the “instantaneous rate of change in the probability of experiencing an actual event at time  $t$ , conditional upon ‘survival’ up to the specified period of time” (p. 10). In this analysis, the hazard function identifies the probability that a student in the risk set will graduate in a particular semester, given his or her values on the independent variables presumed to influence this change (Hearn, McLendon, and Mokher, forthcoming).

### *Advantages of using Event History*

Using an event history model to study student persistence has the advantage of being able to use information collected in student databases. So, using surveys with the usual low response rate issues, instrument validity problems and substantial expense are not necessary. This method allows the researcher to study, for example, the actual impact of financial aid on student retention based on institutional aid data; rather than relying on self-reported and attitudinal data (DesJardins et. al, 1999).

A strong point of hazard models is that one can use time-varying covariates. These are covariates that may change their value over time. Examples of time-varying covariates in the study of student persistence are financial aid and GPA. It is of critical importance to the study of student departure to ascertain not only when an event, such as dropout, is likely to occur but the effect that these time-varying covariates have on the event of interest. According to Allison (1984, p. 11) “there is simply no satisfactory way of incorporating time-varying explanatory variables in a multiple regression predicting time of an event.” Event History Analysis provides a more appropriate method for incorporating time into analyses that go beyond the cross-section.

As discussed earlier, censoring is an important issue in event history analysis. It is usual practice for researchers using cross-sectional analysis to eliminate all right censored cases from the sample. This practice biases the estimates of the duration until the event of interest occurs. Event history analysis does not eliminate the information that is known about censored cases, thus providing an advantage over linear regression models (Yamaguchi, 1991).

In the context of the analysis of survival and event history data, the problem of the bias caused by not being able to include particular important explanatory variables in the regression model is of critical importance. Most models of student persistence (for example, Tinto, Spady,

and Bean) assume that the outcome (dropout) is fully explained by the variables included in the model (DesJardins, 2003). However, even if all the variables are included in the model, it is safe to assume that there are some unobserved factors (such as time) that affect the outcome (Ishitani & DesJardins, 2002). Event history analysis makes it possible to control for unobservable covariates such as time while also controlling for more traditional covariates.

For this study, model with time-dependent variables was developed that estimates when two-year college transfer students dropout or graduate, controlling for academic performance, financial aid, and background factors. The key independent variables include gender, race, socioeconomic status, number of previous institutions attended, percent of previous institutions that were universities, percent of courses that did not transfer, community college GPA, GPA at the four-year institution and financial aid. The two time-dependent covariates are financial aid and GPA at the four-year institution. To guide variable selection I used the models developed by Tinto (1975), Bean (1980) and Weidman (1989) as well as knowledge about the factors that affect the success of native students at the university which is the site of this study. An operational model for understanding the relationship between the independent variables, including the time-dependent variables, and the outcomes of interest is presented in Figure 3.1.

Tinto's model of student departure incorporates students' pre-entry attributes such as race, gender, socioeconomic status, and academic preparation. These pre-entry attributes combined with the degree of academic and social integration experienced by the students were found to have an impact on the decision to stay or leave college (Tinto, 1975). Bean's model was developed by applying a causal model from employee turnover in work organizations to student attrition. His model included three types of variables, background variables such as socioeconomic status and past academic achievement; organizational variables such as college

GPA and goal commitment; and intervening variables which included satisfaction and institutional commitment. Bean developed two separate models for males and females, but concluded that past academic performance and institutional commitment were the strongest variables affecting student attrition (Bean, 1980). Weidman's conceptual model of undergraduate socialization indicates that four different elements affect socialization outcomes. The elements are student background characteristics such as socioeconomic status, aptitude and aspirations; parental socialization which include factors such as the parents' socioeconomic status and parent/child relationships; non-college reference groups such as peers and the actual college experience (Weidman, 1989).

A study was conducted by the Office of Institutional Research of the target university to determine the factors affecting first-to-second year retention for students who were first time freshmen in the Fall of 2004. The analysis delineates the relationship between selected student characteristics and the likelihood of returning for a second year of education. The analysis revealed that females have statistically significantly higher first-to-second year retention rates than do their male counterparts. There were no statistically significant differences noted in the retention from year one to year two with regard to race or parental income. However, Whites had a moderately higher rate of retention than other racial/ethnic categories, and it was noted that as income increased so did the rate of retention. This study also looked at the students' past and current academic history. The analysis concluded that high-school rank, high-school GPA, ACT composite scores and Freshman GPA were all positively correlated to student retention for a second year of education (Office of Institutional Research, 2006).

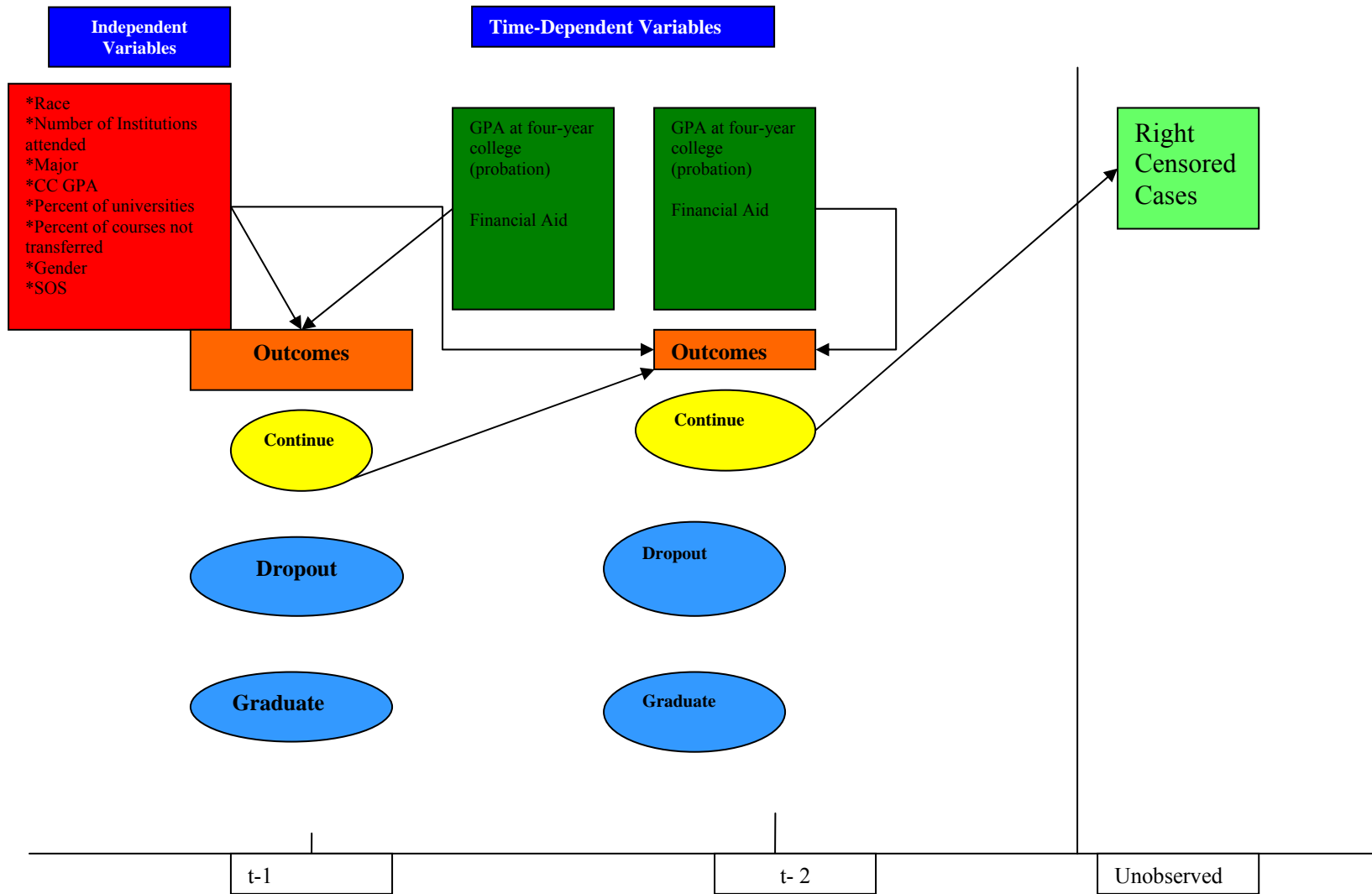


Figure 3.2 – Operational Model



### Sample Selection

The data collected during the course of this research study consists of information about all two-year college transfer students who entered the university which is the site of this study for the first time in the 2003 fall semester. The observation period for this study begins in the 2003 fall semester and ends in the 2006 fall semester. The data set was compiled by extracting information from the university's student information system. The data consists of the students' demographic and background characteristics, term by term academic performance (GPA) at the community college and at the target four-year institution, and term by term financial aid information.

### Data Collection and Analysis

The data described above were retrieved by the computer center of the university which is the site of this study. The data contains no identifiers as to protect the students' identity. The sample includes 830 subjects who were observed for 10 terms.

The explanatory variables for the model include gender, race, poverty level, major, community college GPA, number of previous institutions attended, percent of previous institutions attended that were universities, percent of courses that did not transfer, GPA at the four-year institution and financial aid. Descriptive statistics of the sample are presented in Table 3.1. Gender is a dichotomous variable with the reference group being male. The race variable is comprised of three dummy variables, with the intension of measuring the effects of being Black Non-Hispanic, Hispanic and Other (all other races aside from black non-Hispanic, white non-Hispanic, and Hispanic). White non-Hispanic subjects are the reference group.

The socioeconomic status variable was operationalized by using poverty level as a proxy. The subjects were categorized as being above or below the poverty line based on the poverty threshold stipulated by the 2003 Federal Poverty Guidelines.

A set of five dummy variables was used to assess the impact of academic major. These five dummy variables included students who had majors in business, education, nursing, social sciences, and humanities. The reference group was students who had majors in math and science.

Two time-varying explanatory variables, financial aid and GPA at the four-year institution were included in this study. The values of these variables can change over time, but most importantly, their effects can change over time. Financial aid is included by specifying two variables. The loan variable indicates whether a student received loan aid or not, and the grant variable denotes whether the student was awarded grant aid or not. Conflicting results have been found with regard to the relationship between financial aid and persistence. Thus, these variables are included to examine whether there are longitudinal differences by these two types of aid or combinations of these types of aid.

The relationship between academic performance and persistence is well documented (Tinto, 1975; Spady, 1970). Academic performance at the four-year institution has been operationalized by using probation as an indicator of academic performance.

Several other variables are also considered appropriate for this model and they include the number of previous institutions attended, the percent of previous institutions attended that were universities, the number of hours that did not transfer and transfer GPA.

Table 3.1 – Descriptive Statistics of the Sample

Variable	Description	Term One % or Mean	Term One Range
White Non-Hispanic		0.714458	0 - 1
Black Non- Hispanic		0.183133	0 - 1
Hispanic		0.018072	0 - 1
Other	All other races aside from Black, White and Hispanic	0.074699	0 - 1
Poverty	Below poverty line	0.278313	0 - 1
Female		0.625301	0 - 1
Numprevinst	Number of previous institutions attended	1.603614	1 - 11
Petprevuniv	Percentage of previous institutions that were universities	0.173072	0 - 1
Petnotransr	Percentage of hours that did not transfer	24.96849	0 - 93.75
Transfergpa	Transfer GPA	2.956869	1 - 4
In_aid2	Loan aid	0.668675	0 - 1
Grantaid3	Grant aid	0.456265	0 - 1
Probation2	Academic probation	0.213253	0 - 1
Biz2	Business majors	0.171084	0 - 1
Educ2	Education majors	0.162651	0 - 1
Nurse2	Nursing majors	0.063855	0 - 1
Soc2	Social sciences majors	0.073494	0 - 1
Human2	Humanities majors	0.121687	0 - 1
Mathsci2	Math and Science Majors	0.193976	0 - 1

As Table 3.1 indicates, the sample used is composed of 18 percent Black non-Hispanics, roughly 2 percent Hispanics and 7 percent of individuals from racial groups other than Black non-Hispanic, Hispanic or White non-Hispanic. White non-Hispanics are the reference group and account for over 70 percent of the sample. About 63 percent of the sample is female, and 28 percent of students were below the poverty line when entering the university. Most of the students (66.8 percent) received loan aid during their first term, while 46 percent were awarded grant aid. The average transfer GPA of these entering students was 2.95 and 21.3 percent were on academic probation by the end of their first term at the university. Students in this sample attended an average of 1.6 institutions prior to transfer, and roughly 17 percent of those institutions were universities. On average 25 percent of the credit hours these transfer students brought with them did not transfer. About 17 percent of entering students had a business major, 16 percent majored in education, 6 percent in nursing, 7 percent in social sciences, 12 percent in the humanities and 19 percent in math and science.

The event (dependent variable) analyzed is whether a student exited the institution due to graduation. Four models were estimated by adding the explanatory variables in blocks with the purpose of determining whether adding time-varying variables improved the model fit.

#### Assumptions and Limitations of the Study

There are a number of factors that must be taken into consideration when interpreting the results of this study:

1. An underlying assumption was that the cohort of transfer students used for this study aspired to a baccalaureate degree. Evidence of the presence of this educational aspiration is their transfer to a four-year institution.

2. This study was limited to transfer students who entered the university which is the site of this study for the first time in Fall 2003.

3. This study was limited to an observation period of 10 semesters – from Fall 2003 to Fall 2006.

4. The selection of variables to be included in this study was influenced by theoretical and pragmatic considerations. This study was limited to selected background and academic variables for which data were available in the Student Information System and that had been shown to be of importance in earlier research.

5. This research used only secondary data that includes measured behaviors, such as GPA, and background characteristics. This study did not assess the impact that personal or psychological factors might have on persistence and graduation.

## CHAPTER 4: RESULTS

### Introduction

This chapter presents an analysis of the data that was gathered for this study. The purpose of this chapter is to first, describe the sample. This description will help the reader understand who these students are and will provide a context for the interpretation of the results. Second, present the distribution of the graduation model and its survivor rate. Next, the estimates for two models with time-constant variables are presented. One of these models includes five time-constant variables, while the other has nine time-constant variables. Finally, estimates of two models with time-varying variables are presented. The first model includes nine time-constant variables and two time-varying variables, and the last model consists of fourteen time-constant variables and three time-varying variables.

### The Sample

The sample is made up of 832 students who transferred to the university which is the site of this study in the fall semester of 2003. Table 4.1 depicts the gender and ethnic distribution of this sample. Female students make up 63 percent of the sample. This distribution is similar to that of female enrollment nationwide and in the State of Alabama. Nationally, 57.2 percent of undergraduates are women, while in the State of Alabama; women constitute 58 percent of the total undergraduate enrollment (SREB Fact Book, 2007). The majority of the students are white non-Hispanic (71 percent) with the rest belonging to a minority group. Black non-Hispanics are 19 percent of the sample. This percentage is higher than the national average of black undergraduates (13.4 percent) but lower than the average for the State of Alabama (30 percent) (SREB Fact Book, 2007). The low enrollment of black non-Hispanics

could be attributed to the high-school graduation rates of this student population. The university draws the largest number of students from four counties, namely Mobile and Baldwin counties in Alabama, Jackson county, Mississippi and Escambia county, Florida. The high-school graduation rate for Mobile, Escambia and Jackson counties is 50-60 percent, with Baldwin county having a 60-70 percent graduation rate (EPE, 2007). In Alabama only 50 out of 100 black non-Hispanic students graduate from high-school with similar numbers of black non-Hispanics graduating in Mississippi (58 out of 100) and Florida (47 out of 100) (EPE, 2007). One could argue that the low number of black non-Hispanic high school graduates in the university's service area partially explains their low enrollment in higher education. In the fall of 2006, 26 percent of the students attending community colleges in the State of Alabama were black non-Hispanic. At four-year public universities, black non-Hispanics made up 25 percent of the total enrollment during the same time period (ACHE Statistical Profiles, 2006).

Table 4.1 Sample Distribution by Gender and Ethnicity

Ethnicity	Female	Male	Total
White non-Hispanic	358	235	593
Black non-Hispanic	111	43	154
Other	52	33	85
Total	521	311	832

Research shows (Murdock, 1990) that receiving grant aid has a positive influence on persistence to graduation. The impact of loans however is somewhat inconclusive. For the students in this study the impact differential between grant and loan aid does not appear to be significant (See Table 4.2). Of the students who received grant aid, 29 percent graduated, while

of those who received loan aid 30 percent graduated by the end of the observation period. Only 29 percent of the students who received both grants and loans graduated by the fall of 2006.

Table 4.2 - Graduation by Grant and Loan Aid

	Received Grant Aid	Received Loan Aid	Received both Grant & Loan Aid
Graduated	114	182	109
Not Graduated	281	425	272
Total	395*	607*	381*

\* Duplicated count of grant and loan recipients

Research suggests that income levels play an important role in persistence and graduation (College Board, 2007). In fact, the lower the level of income the less likely a student is to persist until graduation. For the students in this study however this does not seem to be the case. Of the 537 students who did not graduate during the observation period, 72 percent were not below the poverty level (Table 4.3).

Table 4.3 - Graduation by Poverty Level

		Poverty Line		Total
		Above Poverty Line	Below Poverty Line	
Graduated	No	384	153	537
	Yes	216	79	295
Total		600	232	832

There is substantial evidence to support the premise that a child's educational attainment is positively related to the parents' education (Ermisch & Francesconi, 2000; Haveman & Wolfe, 1984; Duncan, 1994). The mother's level of education has been found to be of particular importance. Seventy-nine percent of these transfer students provided information about their mother's highest level of education. Table 4.4 displays the data related to the mothers' highest



educational level of the students in this sample. Over two hundred students indicated that their mother had a least a bachelor's degree. Seventy percent of those students were white non-Hispanic, 20 percent were black and the rest were from other ethnic groups. Forty-six percent of those included in this study indicated their mothers had only a high-school education. Of these students, 71 percent were white non-Hispanic, 23 percent were black non-Hispanic and the rest were from other ethnic groups. It is interesting to note that there are a higher percentage of women than men who have mothers with at least a high-school education (38 percent) or at least a college degree (33 percent). Even though this is an interesting fact, the mother's highest educational level was not included in the models because its correlation with graduation was not statistically significant.

Table 4.4 - Mother's Highest Level of Education by Gender and Ethnicity

Level of Education	White non-Hispanic	Black non-Hispanic	Other	Female	Male
Middle School	31	6	11	33	15
High-School	214	69	19	200	102
College and beyond	187	54	25	174	92
Unknown	12	16	10	28	11
Total	445	145	65	521	311

Regarding those students who graduated, 37 percent had a mother with at least a college degree. Of those who did not graduate, the largest number (204) had a mother with only a high-school education (See Table 4.5).

Table 4.5 - Mother's Highest Level of Education by Graduation

		Mother's Highest Educational Level				Total
		Middle School	High School	College and beyond	Unknown	
Graduated	No	34	204	158	34	537
	Yes	14	98	108	5	295
Total		48	302	266	39	832

The number of hours a student transfers to a four-year institution has an impact on their persistence and graduation (Adelman, 2006). Of the students in this study, 44 percent had 0-20 percent of their hours not accepted, while 3.7 percent had 61-80 percent of their hours not accepted (See Table 4.6).

Table 4.6 Percent of Hours not Accepted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-20 percent	367	44.1	44.1	44.1
	21-40 percent	302	36.3	36.3	80.4
	41-60 percent	125	15.0	15.0	95.4
	61-80 percent	31	3.7	3.7	99.2
	81-100 percent	7	.8	.8	100.0
	Total	832	100.0	100.0	

Of those students who graduated during the observation period, none had 81-100 percent of their hours not transfer. In every instance, students who graduated had more hours transferred than those who did not graduate (See Table 4.7)

Table 4.7 Graduation by Percent of Hours not Accepted

		Percent of hours not accepted					Total
		0-20 percent	21-40 percent	41-60 percent	61-80 percent	81-100 percent	
Graduate	No	200	235	104	30	7	576
	Yes	167	67	21	1	0	256
Total		367	302	125	31	7	832

The students in the sample transferred from a combination of two and four-year institutions. The vast majority (85 percent) came from community colleges in Alabama and surrounding states. The top two feeder colleges are community colleges in Alabama, with one of them being a Historically Black College. Two of the top five feeder community

colleges are out-of-state but because of their close proximity to the university there are in-state-tuition arrangements that allow students coming from these colleges to pay in-state-tuition and fees.

The number of students transferring from another university is small compared to those who come from community colleges. The top five feeder universities include three institutions in Alabama and two in Mississippi. In-state tuition arrangements do not apply to students coming from either of these Mississippi four-year institutions. Table 4.8 shows the number of students who transferred from two-year and four-year colleges.

Table 4.8 Students Who Transferred by College Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 year	708	85.1	85.2	85.2
	4 year	119	14.3	14.3	99.5
	Military service credit	4	.5	.5	100.0
	Total	831	99.9	100.0	
Missing	System	1	.1		
Total		832	100.0		

Research shows that regardless of where students start their postsecondary education, their chances of obtaining a baccalaureate degree are greatly increased by a rigorous academic preparation (Cabrera & LaNasa, 2001). However, the perception that those who attend community colleges prior to transfer are less academically prepared persists (Pascarella & Terenzini, 2005). From Tinto's perspective one could argue that students coming from four-year colleges integrate more effectively than those from two-year schools. Tinto argues that those who do not achieve a certain level of academic and social integration are not likely to persist to graduation.

In this study a measure of academic preparation is the ability not to be in academic probation. Of the students who transferred from a two-year college, 22 percent were on

academic probation at some point during the duration of this study. Twenty one percent of those who transferred from a four-year college were also on academic probation at some point during the observation period (See Table 4.9)

Table 4.9 Academic Probation by College Type

		Academic Probation		Total
		No Probation	Probation	
College Type	2 year	546	162	708
	4 year	94	25	119
	Military service credit	4	0	4
Total		644	187	831

Disaggregating the academic probation figures by the top five feeder colleges (See Tables 4.10 and 4.11) we find that a higher percentage of students from feeder community colleges are on academic probation when compared with their four-year college counterparts. The range of students from community colleges who were on academic probation at some point during this study was 20-36 percent.

Table 4.10 Academic Probation of Two-Year College Transfers

	Number transferred	Number on probation	Percent on probation
College A (Alabama)	191	52	27%
College B (Alabama)	123	36	29%
College C (Mississippi)	122	24	20%
College D (Alabama)	36	13	36%
College E (Florida)	23	5	22%
Total	495	130	26%

Table 4.11 Academic Probation of Four-Year College Transfers

	Number transferred	Number on probation	Percent on probation
University A (Alabama)	15	4	27%
University B (Mississippi)	11	0	0%
University C (Alabama)	10	2	20%
University D (Alabama)	10	5	50%
University E (Mississippi)	8	1	13%
Total	54	12	22%

The ultimate measure of educational attainment is graduation. Only 35 percent of the sample graduated by fall of 2006, with 33 percent of two-year college transfers and 45 percent of four-year college transfers graduating in the same time-frame (See Table 4.12)

Table 4.12 Graduation by College Type

		Graduated		Total
		No	Yes	
College Type	2 year	471	237	708
	4 year	65	54	119
	Military service credit	1	3	4
Total		537	294	831

Reporting graduation by college type aggregates the results, hence hiding the contributions of individual institutions. Tables 4.13 and 4.14 display the graduation rates for the top five feeder community colleges and universities. It is interesting to note that in both cases (community colleges and universities) students who transferred from out-of-state institutions graduate at higher rates than in-state students.

Table 4.13 Graduation Rates of Two-Year College Transfers

	Number transferred	Number graduated	Graduation rate
Two-year college A (Alabama)	191	63	33%
Two-year college B (Alabama)	123	29	24%
Two-year college C (Mississippi)	122	44	36%
Two-year college D (Alabama)	36	8	22%
Two-year college E (Florida)	23	9	39%
Total	495	153	31%

Table 4.14 Graduation Rates of Four-Year College Transfers

	Number transferred	Number graduated	Graduation rate
University A (Alabama)	15	8	53%
University B (Mississippi)	11	7	64%
University C (Alabama)	10	3	30%
University D (Alabama)	10	2	20%
University E (Mississippi)	8	5	63%
Total	54	25	46%

In summary, a typical transfer student who graduates from this university is a white female who transferred from a community college. Her mother has at least a college degree; she received more loans than grant aid, and was able to transfer 80-100 percent of her hours.

#### Distribution of the Graduation Model

Table 4.15 shows the term of enrollment, the number of students enrolled in each term, the number who graduated by term, the number censored in any given term, and the survival rate for graduation. Since the students enrolled in any given term are subject to graduating, they can be considered the risk set. In term 5, 477 students are at risk of graduating since 26 students have already graduated and 327 have been censored. The censored students are those who drop out and are independently censored at the time of dropout because they are no longer at risk of graduation. The hazard rates are also included and calculated by dividing the number who graduated in a particular term by the number enrolled at the start of the term. For example, the hazard rate of graduation after 5 terms of enrollment is  $37/477$  or 0.0775 indicating that students who survive until term 5 have a 7.7 percent chance of graduating.

Table 4.15 - Distribution of Graduation and Hazard Rate

Term	Number Enrolled at Start of Term	Number who graduated before next term	Number censored	Hazard rate
1	830	1	8	0.0012
2	748	0	116	0.00
3	632	15	68	0.0237
4	549	10	62	0.0182
5	477	37	43	0.0775
6	397	54	37	0.1360
7	306	68	65	0.2222
8	173	47	47	0.2716
9	79	19	36	0.2405
10	24	3	21*	0.125

\*It is unknown whether these 21 students re-enrolled for an 11<sup>th</sup> term. These are right censored observations.

The hazard rates of graduation get larger as students remain enrolled, peaking at term 8. It is interesting to note however that the hazard rate drops twelve percentage points between terms 9 and 10. For a graphical depiction of the hazard estimate see Figure 4.1.

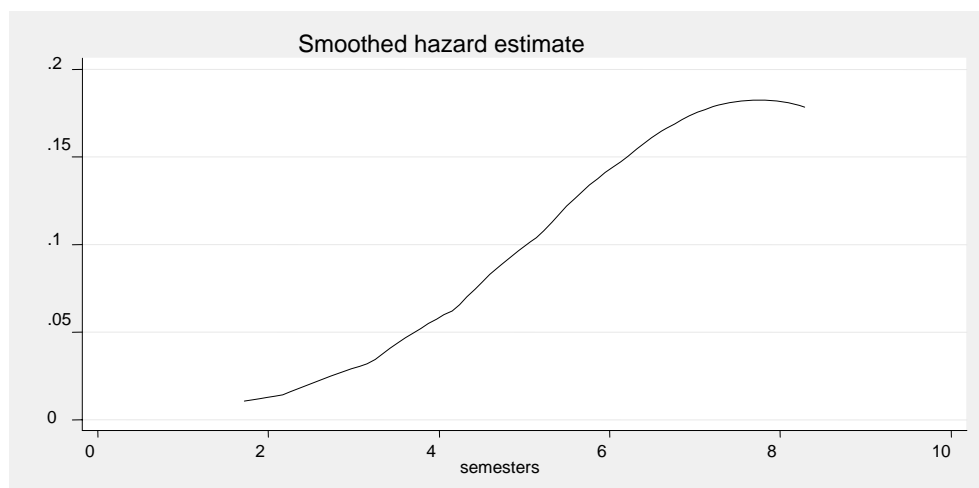


Figure 4.1 – Hazard Estimate

### Models with Time-Constant Variables

The first model tested was a simple model with five time-constant variables. The variables were black non-Hispanic, Hispanic, other (all other races aside from black non-Hispanic, white non-Hispanic and Hispanic), poverty and female. Estimation results for this model are displayed in Table 4.16.

The results of the model suggest that the effect of being black non-Hispanic is statistically significant at the .05 level. One can obtain a relative risk of graduation for a variable by using  $(\exp(\text{coefficient parameter}) - 1) * 100$  (Ishitani & DesJardins, 2002). So the parameter for black non-Hispanics is  $\beta = -0.7099194$ , and the relative risk of graduating for these students is 50.8 percent lower than for white non-Hispanic students.

Being below the poverty level and belonging to the “other” racial category also have a negative net effect on the likelihood of graduation. However, the net effect of these variables is not statistically significant. Being Hispanic as well as being female have a positive effect on the likelihood of graduation but their effect is not statistically significant.

Table 4.16 Time-Constant Variables - Model One

Variable	Coefficient
Black non-Hispanic	-0.7099194*
Hispanic	0.3242476
Other	-0.0373564
Poverty	-0.0872827
Female	0.2132903

\*p<0.05

The second model added four time-constant variables to model one. These variables were the number of previous institutions attended, the percent of the previous institutions attended that were universities, the percentage of credit hours that did not transfer, and transfer GPA. The estimation results for this model are displayed in Table 4.17.



The results of this second model suggest that when these four new variables are added, the net negative effect that being black non-Hispanic had on graduation is no longer statistically significant. The academically related variables added to this model have a statistically significant effect on the likelihood of graduation and their impact seems to eliminate the effect of race.

The risk of graduation for students who attended more than the average number of previous institutions (1.6) is about 4.7 percent ( $\beta = 0.154$ ) higher than for those who attended less previous institutions. This means that attending more than one institution prior to transfer has a positive effect on the likelihood of graduation.

Students who attended universities prior to transfer are more likely to graduate than those who did not. The risk of graduation for students who attended a university prior to transfer is about 86 percent ( $\beta = 0.621$ ) higher than for those who did not.

The percent of credit hours that did not transfer has a negative effect on the likelihood of graduation. The risk of graduation for students who had a higher percent of credit hours that did not transfer is about 2 percent ( $\beta = -0.0213$ ) lower than for those who had more credit hours transferred.

Transfer GPA is positively related to graduation. That is, the higher a student's transfer GPA, the more likely he or she is to graduate. The risk of graduation for students with transfer GPAs higher than the average (2.95) is about 52 percent ( $\beta = 0.4212$ ) higher than students with lower than average transfer GPAs.

The chi-square statistics for the first model and the second model are 16.06 and 80.53, respectively, and they are both statistically significant. This indicates that the second model improves the model fit.

Table 4.17 Time-Constant Variables - Model Two

Variables	Coefficients
Black non-Hispanic	-0.2809396
Hispanic	0.0906759
Other	-0.0164468
Poverty	-0.0451395
Female	-0.0432377
Number of previous institutions attended	0.1540566*
Percent of previous institutions that were universities	0.6218985*
Percent of hours that did not transfer	-0.0213397*
Transfer GPA	0.4212759*

\*p&lt;0.05

### Models with Time-Dependent Variables

The models discussed above include variables that remain constant during the entire observation period. However, there are variables such as financial aid and academic performance that change over time. For example, it is logical to assume that a student can be on academic probation one term, and have a high enough GPA in a subsequent term to get him or her out of probationary status. The models discussed in this section include time-dependent variables.

This model adds two time-varying variables to model two. These variables were loan-aid and grant-aid. Table 4.18 displays the results of model three. Chi-square statistics for model two and model three were 80.53 and 87.67 respectively. They were both statistically significant at the  $p < 0.05$  level. This shows that model three improves the model fit.

The results of this model show that the effects of the number of previous institutions attended, the percentage of previous institutions attended that were universities, the percentage of hours that did not transfer, transfer GPA and grant aid are statistically significant.

Table 4.18 Time-Dependent Variables – Model Three

Variable	Coefficient
Black non-Hispanic	-0.3612009
Hispanic	-0.0472722
Other	-0.0426627
Poverty	-0.2025643
Female	-0.0834166
Number of previous institutions attended	0.1617317*
Percent of previous institutions that were universities	0.6694848*
Percent of hours that did not transfer	-0.0223674*
Transfer GPA	0.380262 *
Loan aid	-0.020296
Grant aid	0.4052201*

\* $p < 0.05$

The number of previous institutions attended has a positive effect on the likelihood of graduation. That is, the students who attend more than the average number of previous institutions (1.6) are more likely to graduate. The risk of graduation for students who attend more than the average number of previous institutions is about 17.5 percent ( $\beta = 0.1617$ ) higher than for those students who do not.

The risk of graduation for students who attended a higher than the average number of previous institutions that were universities is about 95 percent ( $\beta = 0.6694$ ) higher than for those students who do not. This means that attending a university prior to transfer has a positive effect on the likelihood of graduation.

Students who had a higher than average percent of credit hours that did not transfer are less likely to graduate. The risk of graduation for these students is about 2.2 percent ( $\beta = -0.0223$ ) lower than for those who were able to transfer more hours.

Transfer GPA has a positive effect on the likelihood of graduation. This means that the higher the transfer GPA the more likely the student is to graduate. The risk of graduation for

students with transfer GPAs higher than the average (2.95) is about 46 percent ( $\beta = 0.3802$ ) higher than for students with lower than average transfer GPAs.

Finally, students who received grant aid have a higher likelihood of graduation than those who did not receive grant aid. The risk of graduation for those who receive grant aid is about 50 percent ( $\beta = 0.4052$ ) higher than for students who do not receive this type of aid.

The fourth model added six variables to model three. Five are variables representing the students' majors. The sixth variable is probation which is a time-varying variable as it changes from one term to the next. Table 4.19 presents the results of model four. The Chi-square statistics for model three and model four were 87.67 and 160.87, respectively. This reveals that model four significantly improves the model fit.

The results suggest that the effects of the number of previous institutions attended, the percent of previous institutions attended that were universities, the percentage of hours that did not transfer, grant aid, probation, business major, education major, nursing major, and social sciences major are statistically significant.

The number of previous institutions attended has a positive effect on graduation. The risk of graduation for students who attend a higher than the average number of institutions prior to transfer is about 17 percent ( $\beta = 0.1636$ ) higher than for those students who attended less institutions prior to transfer.

Students who attended universities prior to transfer have a higher likelihood of graduation. The risk of graduation for students who attended universities prior to transfer is about 78.5 percent ( $\beta = 0.5798$ ) higher than those who did not attend a university before transfer.

The percent of hours that did not transfer has a negative impact on graduation. This means that the more hours a student is able to transfer the more likely they are to graduate. The risk of

graduation for students who had a higher than average percent of credit hours that did not transfer is about 2.2 percent ( $\beta = -0.0222$ ) lower than for students who transferred more hours.

Receiving grant aid has a positive effect on graduation. Those who receive grant aid are more likely to graduate. The risk of graduation for students who receive grant aid is about 38 percent ( $\beta = 0.3232$ ) higher than for those who did not receive this type of aid.

As expected, students who are on academic probation are less likely to graduate. The risk of graduation for students who are on academic probation is about 95 percent ( $\beta = -3.0396$ ) lower than for those not on probation.

Table 4.19 - Time-Dependent Variables – Model Four

Variable	Coefficient
Black non-Hispanic	-0.2639963
Hispanic	-0.0649512
Other	0.1016595
Poverty	-0.1059612
Female	-0.1887888
Number of previous institutions attended	0.1636975 *
Percent of previous institutions that were universities	0.5798751 *
Percent of hours that did not transfer	-0.0222488 *
Transfer GPA	0.2341959
Loan aid	-0.1126272
Grant aid	0.3232829 *
Academic probation	-3.039668 *
Business major	0.816155 *
Education major	0.5918253*
Nursing major	1.374979 *
Social Sciences major	0.6614322*
Humanities major	0.4071638

\* $p < 0.05$

Majoring in business is positively related to graduation. The risk of graduation for students who major in business is about 1.26 times ( $\beta = 0.8161$ ) higher than the reference group (math and science majors). Students who major in education have a higher likelihood of graduating than

students majoring in math and science. The risk of graduation for students majoring in education is about 80 percent ( $\beta = 0.5918$ ) higher than for math and science majors. Those students majoring in nursing have a risk of graduation about 2.9 times ( $\beta = 3.9549$ ) higher than the reference group, and social sciences majors have a relative risk of graduation 94 percent ( $\beta = 0.6614$ ) higher than math and science majors. It could be argued that the reason why nursing students are more likely to graduate than any other group is because this program has a pre-professional component and an upper division professional component. Admission to the upper division professional component is competitive based on GPA in the pre-professional component. In general, students admitted to the upper division nursing program have demonstrated a stronger academic performance because they must have a minimum GPA of 2.5 in the pre-professional component to be considered for admission.

#### Summary

The use of time-varying variables in the study of student departure added an interesting dimension to this process. The description of the sample discussed at the beginning of this chapter seemed to indicate that being a white female who transferred from a community college and received loan aid was a precursor for graduation. However, the impact of these characteristics vanished when other variables were added to the mix

In the first model only being black non-Hispanic had a statistically significant impact on graduation. In fact, being black non-Hispanic had a negative effect on graduation. For model two a block of “transfer” related variables were added to model one. These variables were the number of previous institutions attended, the percent of previous institutions attended that were universities, the percent of credit hours that did not transfer, and transfer GPA. The addition of these variables eliminated the significance of being black non-Hispanic on graduation. All the

“transfer” related variables had a statistically significant impact on graduation. The number of previous institutions attended, the percent of previous institutions attended that were universities and transfer GPA had a positive net effect on graduation. The percent of hours that did not transfer had a negative impact on graduation.

Two financial aid variables were added to develop model three, namely, loan aid and grant aid. Both these variables are time-dependent variables. Of these two financial aid variables, only grant aid had a statistically significant impact on graduation. All the “transfer” related variables had a statistically significant impact on graduation. Number of previous institutions attended, percent of previous institutions that were universities and transfer GPA had a positive effect on graduation. The percent of credit hours that did not transfer had a negative impact on graduation.

A last set of six variables was added to develop model four. Five of the variables represented academic majors. The sixth variable was academic probation which is a time-dependent variable. Nine variables had a statistically significant impact on graduation. Number of previous institutions, percent of previous institutions that were universities, grant aid, business major, education major, nursing major and social sciences major had a positive net effect on graduation. On the other hand, the percent of hours that did not transfer and academic probation had a negative net effect on graduation. Table 4.20 provides a summary of the relative risk of graduation for statistically significant variables.

Table 4.20 - Relative Risk of Graduation for Statistically Significant Variables

Statistically Significant Variables	Model One	Model Two	Model Three	Model Four
Black non-Hispanic	-0.508	N/S	N/S	N/S
Number of previous institutions attended	Not included in model	0.047	0.175	0.17
Number of previous institutions that were universities	Not included in model	0.86	0.95	0.785
Percent of courses not transferred	Not included in model	-0.02	-0.022	-0.022
Transfer GPA	Not included in model	0.52	0.46	N/S
Grant aid	Not included in model	Not included in model	0.5	0.38
Academic probation	Not included in model	Not included in model	Not included in model	-0.95
Business	Not included in model	Not included in model	Not included in model	1.26
Education	Not included in model	Not included in model	Not included in model	0.8
Nursing	Not included in model	Not included in model	Not included in model	2.9
Social Sciences	Not included in model	Not included in model	Not included in model	0.94

N/S = Not significant



## CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

### Introduction

The purpose of this study was to determine the factors that affect the persistence to graduation of two-year college transfer students. The identification of these factors is important because of the impact that educational attainment has on society and on a student's potential income. Research shows that realization of a middle-class lifestyle is affected by the completion of post-secondary education (Whitaker & Pascarella, 1994; Pascarella & Terenzini, 1991; Cohen & Brawer, 2003). Furthermore, the income levels of those who earn a bachelor's degree are significantly higher than those who do not (Carnevale and Desrochers, 2003; National Center for Education Statistics, 2006, Table 22-1).

Community colleges play a crucial role in the path to baccalaureate attainment. In 2006-07, 35 percent of all postsecondary students enrolled in a community college (NCES, 2008). The fact that community colleges promote access to higher education by having an open admissions policy, and being less expensive than four-year institutions, makes them an attractive option for those potential students who otherwise would not pursue a postsecondary education. However, the impact community colleges have in baccalaureate attainment is constantly being debated. There are two schools of thought regarding their impact, one argues that attending a community college and transferring to a four-year institution does not have a negative effect on earning a bachelor's degree (Adelman, 2006; Lee, Mackie-Lewis & Marks, 1993; Roksa, 2006; Chapa & Schink, 2006) while the other suggests that community colleges divert students from pursuing a baccalaureate degree (Brint & Karabel, 1989; Monk-Turner, 1995, Clark, 1960). Furthermore, structural barriers such as academic preparation, affordability and aspirations appear to

disproportionally affect the educational attainment of underrepresented populations (McDonough, 1997; Horn et al. 2001; Advisory Committee on Student Financial Aid, 2002).

With all of the above-mentioned issues in mind, this study examined the persistence to graduation of two-year college transfer students. The research population for this study was students who transferred to the university which is the site of this research in the fall semester of 2003. This chapter addresses the findings in the context of the research questions, and the policy implications that this research has for higher education in general and the study institution in particular. Also included are a discussion of, and the implications for, future research on student persistence to graduation.

### The Research Questions

This study posed four research questions which formed the basis for this dissertation. These questions and their associated answers are as follows:

1. How does financial aid affect the timing of graduation? As discussed earlier, previous research in this area has been inconclusive. To answer this question, the financial aid variable was divided into loan aid and grant aid, in an effort to distinguish the effect on persistence to graduation of these two types of financial aid. The two models with time-dependent variables show grant aid as having a positive and significant effect on graduation, while loan-aid has a negative but not statistically significant effect on graduation. The findings regarding the impact of grant-aid support those of Astin (1975), and Murdock (1990). These findings identify two problems for the present structure of the financial-aid system. First, the current financial-aid system relies heavily on loans rather than grants, which means that students could be leaving college because of lack of grant-aid. Further research is needed to determine the real impact different types of grant-aid have on persistence to graduation. The second problem deals with the

fact that the largest federal grant-aid program for low income students, the Pell Grant, does not provide sufficient funds to cover the cost of education. The College Board (2007) has determined that in 1986-87 the maximum Pell Grant covered about 52 percent of the average published price of tuition and fees and room and board at a public four-year institution and 21 percent at the average private college. In 2006-07, it covered 32 percent at a public four-year college and 13 percent at a private college. Considering that grant-aid seems to have a significant impact on persistence to graduation, the shortcomings of the Pell Grant could have an even more detrimental effect on access and affordability than previously believed. This is further compounded by the fact that low income students are reluctant to apply for loans (King, 1999), which further restricts access to already underrepresented populations.

Paulsen and St. John (2002) have found patterns in the nexus of finances and persistence based on the different habitus of poor and elite classes. These findings parallel those of McDonough (1997) where the cost of college attendance played a different role in the college selection process of students from higher and lower SES backgrounds. Students from lower socioeconomic backgrounds felt it was their responsibility to figure out how to pay for college but thought it futile to apply for financial aid because of their perception that most people do not qualify for aid.

The issues discussed above point towards the urgent need to truly understand the impact different types of grant-aid have on persistence to graduation. The financial aid system in its current form is not structured to provide support to those generally underrepresented in higher education. Research in this area needs to concentrate not on race alone but on race within social classes (Paulsen and St. John, 2002).

2. How does academic performance at the four-year institution affect the timing of graduation? The relationship between academic performance and persistence to graduation is well documented (Tinto, 1975; Spady, 1970). Academic performance at the four-year level was operationalized by using academic probation as an indicator of performance. As expected, being on academic probation has a negative and significant effect on graduation. This finding is of particular importance to faculty and college administrators as they can target students on academic probation with support services that will help them remedy their deficiencies and continue their studies until graduation.

The academic probation policy in the study institution stipulates that a student who has a semester GPA below 2.0 will be placed on academic probation and must sit-out for a semester before re-enrolling. The results of this study seem to indicate that the academic probation policy might be having an adverse effect on persistence. Students who are on academic probation are at a higher risk of dropping out, and instead of providing them with the support services they need to succeed, the study institution is pushing them out the door by asking them to sit-out a term. Tinto's model (1975), specifies that integration, both academic and social, work together to influence ongoing intentions and commitments, which in turn influence the decision to stay or leave college. The academic probation policy of the study institution contradicts the central idea of academic integration. When students go to college, they enter an academic system characterized by grade performance, intellectual development, and interaction with faculty and staff which together lead to academic integration. Students placed on academic probation and asked not to return for a semester fail to achieve the necessary level of academic integration that would influence their decision to persist. In conclusion, this academic probation policy should be changed and instead of requiring students to stay away from college for a semester, it should

require them to take part in a student support program that addresses their academic weaknesses which will enhance their chances to succeed in college.

3. To what extent does race, socioeconomic status, or gender affect the timing of graduation? Contrary to the results of most other studies, this research has found that neither gender nor race or being below the poverty line have a significant effect on graduation. In trying to explain these inconsistent results, one might argue that this sample being 73 percent white, 63 percent female, and 72 percent above the poverty line is not diverse enough to fully answer this question. One might also argue that the way socioeconomic status was operationalized in this study does not fully account for the different facets of this construct. It is also important to remember that this study was limited to an observation period of 10 semesters, and that it used only secondary data that includes measured behaviors, such as GPA, and background characteristics. This study did not assess the impact that personal or psychological factors might have on persistence to graduation. It would be advisable to operationalize socioeconomic status more broadly to incorporate not only income but also some measure of habitus.

4. How does academic performance at the community college affect the timing of graduation? Academic performance at the community college was measured using transfer GPA. This variable was found to have a positive and significant impact on graduation when performance at the four-year institution was not considered. However, when the model included both transfer GPA and academic probation, transfer GPA while still having a positive effect on graduation, was no longer significant. This leads us to believe that performance at the four-year institution outweighs performance at the community college.

These results support Tinto's (1975) concept of academic integration. If a student cannot meet the academic performance standards of the four-year institution and is placed on academic

probation, his or her chances of academic integration are greatly diminished. Bean (1980) argues that poor academic performance leads to student dissatisfaction which in turn leads to drop-out. As discussed under the results for research question number two, the academic probation policy of the study institution is not conducive to persistence. This policy forces student to sit-out for one term which further discourages faculty-student interaction. Both Tinto (1975) and Weidman (1989) argue that faculty-student interaction is indispensable for academic integration. Furthermore, the study institution fails to address the academic shortcomings of those placed on probation by not providing them with any means of remedying their academic shortcomings.

During the course of this study a review of the data pointed to four issues that were not directly addressed by the research questions. First, the importance of a strong 2/4 transfer performance posited by Wellman (2002) is supported by the findings of this study. Students who had difficulty transferring the bulk of their credits were at a higher risk of not graduating. In fact, in every instance students who graduated had more hours accepted for transfer than those who did not graduate. This is of particular importance to the state of Alabama because there is a legislative mandate which was put in place to improve the transfer process among all public institutions of higher education. This legislative mandate created the Alabama Articulation and General Studies Committee (AGSC) which was charged with developing a statewide general studies curriculum and with developing a statewide articulation agreement. This mandate also created the Statewide Transfer and Articulation System (STARS) with the purpose of communicating and implementing the policies developed by the AGSC. The statewide articulation agreement has been in place since 1999; however its effectiveness has never been examined. Students from two-year colleges wishing to transfer to a four-year institution can access the STARS system where they can find AGSC approved transfer guides for the major

they want to pursue. Students develop a “transfer agreement” which spells out the courses that will be accepted by the four-year institution. Students are asked to present that agreement at the time of transfer. The receiving institution is obligated by law to accept all the courses included in the agreement. The results of this study seem to indicate that students are having difficulty transferring courses from two-year colleges. Receiving institutions are not required to track the number of students who actually use a transfer agreement or to retain copies of any transfer agreements presented at the time of admission. This makes it difficult to ascertain whether the complexity of transferring credits stems from four-year institutions not following the rules or students not taking the courses included in their transfer agreements. Second, students who attended more than the average number (1.6) of institutions prior to transfer to the study institution were more likely to graduate. This could be due to increased familiarity with college expectations, and a better understanding of the system which allows them to navigate their way along the educational pipeline. One could argue that with experience these students have better defined what Weidman (1989) calls their socialization outcomes; hence they have a clearer picture of their career choices or life-style preferences which provides them with the motivation to persist to graduation. This is supported by the adult education literature which indicates that adults accumulate an increasing reservoir of experience which becomes a rich resource for learning (Knowles, 1980). One might also argue that these transfer students are at a stage in their cognitive development where they are able to cope with the challenges of a four-year institution. The literature on cognitive development indicates that maturation and environmental factors contribute to moving adults toward a final state of cognitive development (Merriam and Caffarella, 1999). This is further supported by the fact that the average age of the students who came from the two top feeder community colleges was 26.4 and 28.8 years of age. Third, in this

study students who transferred from a four-year institution had a higher chance of graduation than their community college counterparts. This supports Pascarella and Terenzini's (2005) assertions that community college do not provide adequate academic preparation for baccalaureate attainment. Furthermore, the academic preparation provided by Alabama community colleges seems to be inferior to that of neighboring two-year institutions evidenced by the number of their students on academic probation at some point during the observation period of this study. The last issue deals with academic preparation as it relates to major. The findings of this study show that students who major in programs with selective admissions are more likely to graduate. This degree of selectivity allows academic programs to filter out weak students that are not likely to persist to graduation. Nursing and Business are the most selective programs in the study institution, and students majoring in those programs are at the highest risk of graduating.

The Nursing program in the study institution has some very stringent requirements. The program has a pre-professional component and an upper division professional component. Students must pursue a very prescriptive curriculum during their first two years (pre-professional). This curriculum includes a science course at the three hundred level which is not offered at any community college. This requirement forces all transfers from community colleges to take at least one course in the study institution before applying for admission into Nursing. At the completion of this course of study, students must apply for admission to the College of Nursing. The college has a limited number of places, and on any given year has at least three applicants per slot. All applicants must have a minimum GPA of 2.5 in the pre-professional component to be considered for admission. The College of Nursing has no incentive to accept weak students for two reasons: 1) The high demand for places allows them to accept



the most academically qualified students and, 2) Nursing accreditation requires all programs to demonstrate that at least 90 percent of their graduates pass the licensing exams. Taking weak students would only put their accreditation at risk.

The College of Business has introduced changes to its curriculum and added some roadblocks that require students to prove their college readiness. During the first two-years of study, students are required to take an “Introduction to Business” course sequence that addresses the students’ ability to write at the college level. Those courses make use of standardize tests, which students must pass to move forward in the curriculum. If students fail those tests, they must take a remediation seminar before they are allowed to take the tests again. The college also has a requirement for all juniors to take a standardize exam which tests their mathematical and writing abilities. Once again if students fail that test, they must take a remediation seminar before taking the test again. While the College of Business does not have near the demand experienced by the College of Nursing, their students must pass a major field test prior to graduation. All the roadblocks placed along the way are being used to eliminate weak students who would affect the pass rates and the overall graduation numbers for the college.

In general, the programs that have more students at risk of graduating are those that have implemented gatekeeper measures to ensure the academic preparation of their students. This practice further emphasizes the need for transfer students to acquire a rigorous academic preparation prior to transfer.

### Policy Implications

The research findings presented have implications for policy making in higher education in general. Research shows that students from low-income backgrounds and minorities are prone to higher rates of dropout (NCES, 2003). The results of this study are not fully consistent with

the national level studies in that being a member of a minority group or having an income below the poverty level do not have a statistically significant impact on graduation.

In this study, race, class and gender do not have a statistically significant impact on the likelihood of graduation. While these variables are at the core of most models, these findings seem to indicate that race, class and gender alone cannot account for persistence to graduation. This is of critical importance to policymakers and college administrators because student support efforts must be based on the deficiencies in academic preparation which students bring with them. Federal, state and institutional support programs should look beyond race, class and gender if they are to address these deficiencies. For instance, federal TRIO programs provide student support services in the form of opportunities for academic development to ensure that participants complete their postsecondary education. Some of these projects also provide grant aid to program participants that receive Federal Pell Grants. These programs select their participants not on the basis of their race, class or gender but on their ability to access the resources they need to successfully complete a postsecondary education.

Some of the national databases include information on student financial aid; researchers should closely examine how the different types of grant aid awarded over time affect persistence to graduation. By providing better information on the effects of grant aid, policymakers may be able to restructure how grant aid is distributed over time. By adopting a longitudinal perspective on the effects of types of grant aid will allow for the provision of targeted support to those in need thereby reducing grant aid related attrition.

Federal government requirements, such as IPEDS reporting, to collect and disseminate retention and graduation statistics could benefit from a better tracking system of students beyond the walls of their original institution. The myopic view of only considering the student's original

institution stifles the ability to demonstrate institutional accountability. Furthermore, if educational researchers are better able to document and explain students' transitions from one college to another, the accountability emphasis would move from institutional to systemic accountability. Also, it is necessary to link student outcomes data to state and federal files so researchers are better able to document the individual and social benefits of a college education.

At the state level, access and time to degree have come under increased scrutiny by legislators and the general public. One of the aims of this study was to evaluate the success of transfer students in the State of Alabama. The results indicate that community college transfer students are ill prepared for the demands of a four-year institution. The state needs to reevaluate its general education curriculum to ensure that the content being taught at the community colleges matches the expectations of the four-year institutions. More communication needs to occur between four-year and two-year institutions to ensure that potential transfer students have the skills and knowledge necessary to be successful at the four-year level.

Another issue that needs to be considered is the need to evaluate the quality of the education provided by individual community colleges. Conducting aggregate studies of the performance of community college transfer students masks the contributions of individual institutions. As this study has shown, students who transferred from certain community colleges performed better than others. By providing better information on the quality of the academic preparation provided by different community colleges, state officials may be able to better evaluate the effectiveness of individual institutions and provide the support required by those institutions which need it the most.

The state needs to do a better job of tracking transfer students. At present, the information available deals with the numbers of students who transfer within the state. No

information is gathered regarding their success once they transfer. Student outcomes data should be linked to state databases to provide a clearer picture of how students progress through the higher education pipeline. State policymakers should mandate that all institutions report on the progress of transfer students. Presently, institutions do not provide any information to the state regarding the performance and progress of transfer students.

Educational researchers at the state level need to take an in-depth look at the academic preparation of students who transferred from neighboring states. This study has shown that out-of-state transfer students are better equipped for the demands of a four-year institution. This type of research has the potential of providing state stakeholders with some answers regarding the quality of academic preparation needed to succeed in a four-year institution.

Studying student careers longitudinally also has policy implications for institutions of higher education. As this study has shown, the impact of variables such as race diminishes when academic variables are considered. The use of an event history methodology provides institutions with more accurate information needed for effective enrollment management. For example, scholarship programs can be designed to target students at the time when they are most in need.

This study has found that the factors that seem to have a more significant impact on graduation are all academic related. These findings support Tinto's and Cabrera et. al. (2001) arguments that academic integration and preparation are precursors to student persistence to graduation. These results can help institutions save resources by being able to determine at-risk students early on and develop support services to address their needs.

Recruitment of college students has become a sophisticated enterprise which is expensive to conduct. Anecdotal evidence suggests that it is more efficient to keep students enrolled than

to try to replace students through recruitment. If this is true, and event history models are able to identify students at-risk of dropout, then this approach will be a desirable methodology to apply.

Another implication that this study has on enrollment management is related to admission standards. Requiring transfer students to demonstrate higher levels of academic preparation before transferring has shown to have a positive impact on graduation. Faculty and university administrators need to reevaluate their admission requirements to ensure that students have a fair chance of success. If state regulations do not allow for the modification of admissions standards, two potential solutions are feasible: (1) re-structure the programs to have a pre-professional and a professional component, and have selective admissions to the professional component, and (2) develop bridge programs for transfer students that will address the deficiencies in their preparation.

Also, the exercise of tracking and reporting on the progress of transfer students must be addressed. Faculty and university administrators need to know how transfer students perform if they are to support institutional actions that enhance the retention and graduation of this student group. Better information about the impact of academic support programs as well as the interaction of program learning outcomes with persistence to graduation will provide valuable information for policy development at the institutional level.

#### Directions for Future Research

Several possibilities exist for new areas of research including how policy related variables affect student persistence to graduation. It will be useful to examine how student behavior changes when grant aid is increased or decreased. This line of research can provide decision makers with information on how components of financial aid affect time to graduation.

Little seems to be known about the effect of changes in financial aid overtime, especially because financial aid packages are constantly changing. Thus, increase in knowledge in this area would be valuable.

Another issue regarding grant-aid that merits further study is looking at the impact that the different types of grant-aid have on persistence to graduation. Considering that Pell Grants do not provide sufficient funds to cover the cost of education, this type of research could yield some valuable information for policymakers and college administrators.

Another possible area of further research is including attitudinal measures such as educational goals and student satisfaction. The addition of these types of measures would address the social integration piece of Tinto's model. While it is more time consuming and has the potential of decreasing the statistical precision of the model, the tradeoff might prove beneficial to individual institutions.

A fourth direction for future research is to use event history models on groups of students with similar characteristics, for example majors. Such analysis will allow for a closer examination of the reasons why students of certain majors are at a higher risk of graduating than others.

Another possible area for future research is to use event history models at the system level. For instance, applying these models to the two-year college system in Alabama will facilitate the identification of systemic problems. This type of information would be useful for the development of state policies to enhance student success.

In conclusion, using longitudinal models to study students' persistence to graduation provide a more accurate view of a student's academic career. The study of persistence to graduation must look beyond demographics and adopt a broader perspective that encompasses

the academic preparation of transfer students. This approach will yield better information to help decision makers design appropriate education policies. Hopefully, the research presented in this dissertation will help higher education policymakers design effective strategies that will improve students' college experiences, increase institutional effectiveness, and further enhance the value of education to society.

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