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Academic Persistence Factors for Students Who Delay College Entry

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ACADEMIC PERSISTENCE FACTORS FOR STUDENTS WHO DELAY COLLEGE

ENTRY

BY

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Submitted in Partial Fulfillment
of the Requirements for the Degree
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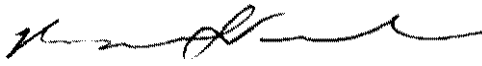
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Abstract

ACADEMIC PERSISTENCE FACTORS FOR STUDENTS WHO DELAY COLLEGE ENTRY

Many more students begin college than complete their degrees. Retaining students to graduation has been the objective of many research studies; however, college students are changing. Changing demographics in the United States are creating changes in the college student population that could not have been foreseen years ago. In order to inform policy in a changing climate, the research community must study the changes in the student body and what factors are important to the persistence of the new college student. This study will use Adelman's framework from *The Toolbox Studies* in conjunction with the Beginning Postsecondary Survey in order to identify the academic persistence factors for students who delay college entry. The juxtaposition of academic momentum in combination with a break in curriculum (students who delay) offers us a window on the importance of high school and college academics for this growing cohort of students. Academic persistence factors found to be common to all students were high school grades and earning 20 or more credits in the freshman year. Participating in study groups was found to be positively associated with persistence for students who delayed college attendance.

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CHAPTER I

INTRODUCTION

The change from an industrial economy to a technological economy has changed the US in important ways that demand technological literacy and the ability to master the skill set of being a lifelong learner (*College learning for the new global century*, 2007, pp. 146-147). Change is occurring at an ever-increasing rate, which dictates that many individuals are working at jobs or being trained for jobs that are projected to not exist in 20 years. Indeed, Edyburn (1999) notes that,

The longevity of knowledge is often discussed in half-lives, or the amount of time it takes for half of the information in a field to be rendered obsolete. Some estimates indicate that the half-life of information is 3 to 5 years. (p. 21)

The importance of a bachelor's degree for individuals and for society cannot be disputed (Leslie & Brinkman, 1988; Lin & Vogt, 1996; Pascarella & Terenzini, 2005). According to Bowen and Bok (1998), there are "substantial additional benefits [that] accrue to society at large through the leadership and civic participation of the graduates and through the broad contributions that the schools make to the goals of a democratic society" (p. 276). Furthermore, the bachelor's degree is considered to be the "gatekeeper to myriad social and individual benefits" (Cabrera, Burkum, & La Nasa, 2005, p. 155). Many researchers have specifically highlighted the economic benefits to the individual for completing a college education (Becker, 1992; Berger, 1992; Cappelli, 1997; Conley,

2005; Leslie & Brinkman, 1988; Perna, 2003). Paulsen (1998) notes, “the magnitude of earnings differentials between college and high school graduates- which has increased substantially since the mid-1970s- is clearly one of the most striking and straightforward demonstrations of the value of a college education” (p. 286). Gladieux and Swail (2000) also note that “forces running deep in our economy have ratcheted up skill and credential requirements in the job market and put a premium on education beyond high school” (p. 688).

The Bridge Project, a major national research study focused on the connection between high school and college, surveyed high school freshmen and found that 90 percent aspire to attend college (Kirst & Venezia, 2004). As the rewards of higher education continue to increase, the rate at which students will aspire to attend higher education institutions will likewise increase in number and size. This means an increase in the pool of prospective college goers. As this pool increases, the students will become increasingly heterogeneous.

Just attending college is not enough; in order for all parties to fully benefit, the student must complete the degree requirements.

Despite the obvious benefits of higher education, attendance has become an economic hardship for many as tuition and fees soar beyond the reach of many American families (Lewin, 2008) and the social ideal of access for all is threatened. Public sentiment has been focused on accountability of higher education as the price of a postsecondary degree has outpaced the consumer price index for other goods and services

(Delbanco, 2007). Graduation rates are scrutinized as a measure of persistence for individual institutions, as well as for postsecondary education as a whole. There are significant external pressures for institutions to admit students who are more likely to be persistent, as well as to better understand how to promote the persistence of those students who are already enrolled. The Student Right to Know Act of 1990 ("Student Right-to-Know and Campus Security Act of 1990," 1990) requires substantial reporting with regard to graduation rates (Adelman, 2001) and many college guides offer this information to prospective students. Publications such as the "U.S. News and World Report College Ranking Issue" are very popular and quite influential and have exerted substantial pressure on institutions to promote and report on student persistence as measured by retention and graduation.

Forced to cope with tight, if not shrinking, budgets, institutions face mounting pressure to improve their rates of student retention and graduation. In many cases, this pressure reflects the movement of states to include graduation rates in a system of institutional accountability. In other cases, this pressure reflects the impact of widely publicized ranking systems that include graduation rates as measures of "quality". In still other cases, this pressure mirrors the reality that increased student retention is critical to the stability of institutional budgets. (Tinto, 2005, pp. ix-x)

Braxton, Hirschy and McClendon concur: "Rates of departure negatively affect the stability of institutional enrollments, budgets and the public perception of the quality of colleges and universities" (2004, p. v). Retaining students to graduation is a positive

outcome for institutions as well as for higher education in general, but it is becoming more challenging as the pool of students increases and becomes more diverse.

Variously identified as student mortality, college dropouts, attrition, retention, persistence, or degree attainment (Berger & Lyon, 2005), many studies have been done which focus on keeping students at institutions, or keeping them until they graduate. Many of these studies have been performed at the institutional level so that individual institutions can help to improve the odds of making their own students persistent (Braxton & Lien, 2000b). Attrition, the opposite of retention, affects individual students in an obvious way, and the numbers of students leaving without attaining a degree has an impact on society in many negative ways, but there is also a more immediate effect on institutions (Beal & Pascarella, 1982). All institutions are dependent on tuition revenue for a share- at least- of the funds that keep the institution solvent. "Students who do not persist represent significant revenue loss for their institution, particularly those institutions that have less emphasis on research activities" (Schuh, 2005, p. 278); the direct costs to the institution "reflect the investment that is made in students who do not persist as well as income that is not realized when students leave their institution" (p. 291). When students leave, they must be replaced by new students. There is always a lag which creates a revenue gap. It is expensive to continually invest in recruiting new students (Bontrager, 2004; Hossler, 2004). This is money that might otherwise be used to improve individual student outcomes. In a review of the history of retention research, Berger and Lyon (2005) found this to be true. "[T]he soaring costs of higher education in conjunction with decreased ability of institutions to raise tuition and fees created more

pressure for institutions to retain students already enrolled rather than spending greater resources on attracting new students" (p. 4).

Those institutions which are not completely dependent on tuition and fees are fortunate enough to have an endowment or state support and are likely to have participated in the stock market. Recently, the economic changes wrought by extreme changes in the stock market have added a new set of challenges for these institutions. Kingsbury and Fitzpatrick found that "over the past decade, schools have financed their operations with ever escalating tuition and fees...and increasingly sophisticated investment portfolios" (2008, p. 38). These institutions (often the most selective and prestigious of institutions) which were insulated by a favorable investment environment may now be finding themselves in the same position as their less fortunate peer institutions (Kingsbury & Fitzpatrick, 2008). No institution is in a position to waste precious resources on students who they cannot help to persistence.

Keeping students in institutions and fostering their persistence have been topics of much research and discussion. Student attrition is costly for all parties, especially institutions, few of which can afford to not be focused on retaining their tuition-paying students. External pressures on institutions create legitimate focus on graduation rates, thus the persistence of all students is a goal. The gates of the academy have been opened to many populations by varying forces: changing demographics, public policy initiatives (as represented by legislation such as the G.I. Bill, affirmative action, and financial aid programs designed to ease the burden on students with greater financial need), as well as

the demands of the age of technology on society. For many in higher education, the dilemma is more far reaching than the simple day to day economics of running an institution. "Although many administrators will first think about retention in terms of funding and accountability, just as important is the moral commitment to students" (Braxton, et al., 2004, p. xi). Increasing access to higher education without fostering the persistence of all students falls short of the demands of our society.

Statement of the Problem

Despite the rewards of completing a degree for both the individual and society (Perna, 2003), many students enter higher education and do attain a bachelor's degree. Sixty-four percent of all recent high school graduates who were first time beginners and began their postsecondary studies at a 4-year institution completed their bachelor's degree within 6 years (Berkner, He, & Cataldi, 2002), but this is the population that statistically enjoys the most persistence at degree attainment. Other populations of students are less persistent. According to the, *Digest of Education Statistics- 2007*, of those students who began at a 4-year institution, only 31 percent of students who delay entry to college graduate within 6 years (National Center for Education Statistics, 2008, Table 318). What accounts for this lack of persistence? Conversely, what factors make students more likely to be persistent?

Even as the number of high school students in the US peaked in 2007 and is not projected to reach that level again until 2015 (National Center for Education Statistics, 2008, Table 3), the number of students entering our postsecondary institutions is

projected to continue to rise (National Center for Education Statistics, 2008, Table 3).

The undergraduate student ranks are made up of those students who follow what is considered to be the traditional route, directly from high school to continuous enrollment in a full-time degree program (Carroll, 1989), as well as those who follow a less traditional path. The percentage of non-traditional students is growing and this trend is projected to continue. A study issued by the Council for Adult and Experiential Learning (CAEL, 1999) noted that “only about one-quarter of American college students attend full-time as residential students, while nearly half can be defined as adult learners“ (p. 1). In 1970 students classified as adults¹ made up 28% of all enrollment in degree granting institutions, whereas today that figure hovers around the 40% mark and is expected to increase incrementally to 41% by 2018 (U.S. Department of Education, 2008, Table 190).

Traditionally, 4-year college students have enrolled full time immediately after graduating from high school; depended on their parents to take care of most, if not all, financial responsibilities; and worked part time or not at all. Today, only 40 percent of 4-year college students fit this traditional mold. (Choy, 2002, p. 5)

Students are the primary citizens of the community of higher education (Göran & Greg, 2007). As such, students and their evolving needs are the primary force toward change in the community. When all of the students were more similar than not in terms of

¹ Adult students are defined by the U.S. Department of Education as those 25 years of age and older. This will be explored more fully in the literature review.

background and preparation for college, keeping up with their evolving needs was challenge enough.

Until recently, the preponderance of college students [were] traditional age dependents. This large, relatively homogeneous pool of recent high school graduates made it fairly easy for higher education to maintain the status quo, because these students all wanted much the same experience. (Longanecker & Blanco, 2003, p. 52)

In order for institutions to compete in a changing market of student needs, it is necessary for institutions to better understand the impact of the changing demographics on those needs for disparate populations. These new students are also more likely to choose paths through higher education which are distinct from the pattern considered to be traditional (full-time, continuous enrollment); they are likely to be enrolled part-time, to stop out temporarily, or to register at different institutions as transfer students, or to register at more than one institution simultaneously (McCormick, 2003).

The five choices [individual students make] that appear to affect [their] persistence are type of institution attended, attendance status, housing arrangement, student loans and employment. The message these data send is that the traditional choices- living on campus and studying full-time- remain the factors most associated with academic persistence. Of course, this traditional approach is expensive, but it pays off in the long run in several ways: increased likelihood of graduation, shorter time-to-degree, and lower opportunity costs. (King, 2003, p. 81)

Those students who delay their postsecondary education have more barriers to persistence. The literature tells us that these students are more likely to come from lower socioeconomic status backgrounds (Gladieux & Swail, 2000), are more likely to be a minority (Gladieux & Swail, 2000), are more likely to attend part-time, are more likely to have come from one parent households (Lillard & Gerner, 1999), and are more likely to be young parents (Corrigan, 2003). Many of the attributes for this group of students are similar to those of students who are considered to be “at risk” for not completing their degree program. “A number of factors have been shown to put students at risk of not completing their degree programs. Two of the most important ones are part-time enrollment and delaying entry into postsecondary education after high school” (Berkner, et al., 2002, section 10, para. 1). “75 percent of undergraduates possess at least one non-traditional characteristic (such as attending part-time or being a parent) that is associated with a decreased likelihood of persistence to a degree” (King, Anderson, & Corrigan, 2003a, p. 1). Indeed, these non-traditional characteristics are identified as “risk factors” in the NCES data sets such as the one used in the present study (National Center for Education Statistics, 2005). Each risk factor represents a distinct level of risk for non-completion of the bachelor’s degree. The non-traditional characteristics noted in the literature include being older (25+ years), being a parent, attending part-time, commuting to college, and delaying college entry (Bean & Metzner, 1985; Choy, Horn, Nunez, & Chen, 2000). “Thirty years ago, the overwhelming majority of college students were white and under the age of 25. Today, 28 percent of students are persons of color and a

third of undergraduate students are twenty-five years old and older" (Anderson, 2003, p. 3).

Most studies of postsecondary student persistence have been focused on the traditional student. At a macro level, the U.S. Department of Education, through the National Center for Education Statistics, collects information from all parts of the education process as part of its mandate. There are national data sets which are designed to provide a great deal of information about students as individuals in order for researchers to be able to construct analyses about students and the postsecondary experience. Just such an analysis can help researchers to better understand what makes students persist, not just at a single institution, but at a cross section of institutions with a sample of students designed to represent the college-going population across the United States. The Beginning Postsecondary Longitudinal Study (BPS) is just such a data set from NCES which can be used to develop an analysis of student persistence². As more students take advantage of the portability of credits to transfer from one institution to another and sometimes another (Caison, 2004; Peter & Cataldi, 2005), the importance of examining the situation at a macro level becomes more evident.

Institutions are slow to change; the prevailing ethos is to meet the needs of the traditional student, sometimes at the expense of all other students. Decades ago, Moore (1970) found the following:

² The BPS is a subset of the National Postsecondary Student Aid Survey (NPSAS), which uses telephone surveys and other sources to identify individual postsecondary experiences for a cohort of students. More detailed information can be found about this data set in the methodology section of this paper. This is the source of evidence for this study.

Disregard for the marginal student is one of the provocative footnotes that demonstrate the inability of higher education to come to terms in dealing with the nontraditional college student. In this way, post-secondary education has made little or no attempt to manage change or match the prevailing needs with the times. (p. 5)

Non-traditional students have been marginalized on campus and in research. Traditional students are easier to study in many respects; they attend full-time and often their lives revolve around the institution. Many national data sets are defined in ways that limit the non-traditional population available for study³. The non-traditional student represented a minority until recently, and now the changing demographics of college students demand that this population be considered as they represent the majority of students (Council for Adult and Experiential Learning (CAEL), 1999; Hussar & Bailey, 2008).

Changing demographics and public demands for access have already begun to change the face of higher education. Students have more flexibility to choose, and thus to act more like educational consumers (Zemsky, Wegner, & Massy, 2005). The changes in federal financial aid policy in 1972 gave students the power to take their aid dollars to the institution of their choice and reinforced the notion of the student as consumer (Adelman, 2001).

³ The Beginning Postsecondary Survey used for the present study, for instance, considers only students who begin in the cohort semester as full time students and many non-traditional students attend part time. This is still the national student survey best suited to the examination of the delaying cohort- see the Methodology chapter.

Students have taken this opportunity seriously and are now defining the college experience in terms of their life goals in very different ways: they may be looking for a few courses or a subset of an academic program rather than a degree; they may not be willing to have their higher education experience limited by the space and time boundaries set by traditional colleges and universities; they may care little about finding those experiences in a single institution over a 4-year period. In sum, the paternalistic environment that institutions thrived on does not work for the student of today.

(Longanecker & Blanco, 2003, p. 52)

In a study of non-traditional students and the impact of changing attendance patterns on institutions, Walvoord (2003) examines the reality of improving outcomes for all students as resources shrink for postsecondary education. She identifies a productivity gap wherein the tried and true means to increase productivity in academe are based on traditional students who attend in traditional ways. In the same issue of *New Directions for Higher Education*, Longanecker and Blanco (2003) take a critical look at the public policies affecting all students in higher education that were formed in response to the needs of traditional students but fall short of supporting the persistence of the many distinct populations today. Their forecast for the future is grim with regard to changing public policies to foster the persistence of those students who are different from the traditional student.

Such traditional methods of enhancing productivity assume that the diploma itself is sufficient proof of learning. These perspectives view the student as product, not as

contributing member of the productivity quotient; they see students as similar, with learning goals in line with the institution's and moving through the institution in cohorts. (Walvoord, 2003, p. 35)

"Today's students are indeed diverse, not only in terms of age, ethnicity, socio-economic level, sexual orientation, and part-time or full-time status, but also in terms of expectations, attitudes, intellectual capabilities, and learning styles" (Schroeder, 2003, p. 55). The diversity of these new students with regard to expectations and preparedness is the crux of the challenge, but the demographic shifts in the student body can help leaders and policy makers to better understand the challenges that they will bring to higher education.

Clifford Adelman, then a senior researcher for the U.S. Department of Education⁴, tried to tease out factors most likely to have a positive association with bachelor's degree completion (1999, 2006). His original report, *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment* (hereafter noted as the *Original Tool Box*), identified the importance of high school curricula, particularly the importance of mathematics and what Adelman termed "academic momentum" (Adelman, 1999). Academic momentum represents the process of course taking continuously through high school and college which keeps a student academically engaged (Adelman, 1999; Adelman, 2006). A follow-up study was published in 2006, *The Toolbox*

⁴ Dr. Adelman has been a senior associate with the Institute for Higher Education Policy (IHEP) since 2006.

Revisited: Paths to Degree Completion from High School through College (hereafter noted as *The Toolbox Revisited*), and the results were similar.

The juxtaposition of academic momentum in combination with a break in curriculum (students who delay) offers us a window on the importance of high school and college academics for this growing cohort of students.

Purpose Statement

The purpose of this study is to determine what academic factors have salience for the persistence of the non-traditional student in higher education. This growing cohort of students needs to be better understood in order for institutions to meet their needs and help them to attain a bachelor's degree. Is there a relationship between high school academics and persistence for these non-traditional students that mirrors the relationship found for traditional students (Adelman, 1999; Adelman, 2006)? Is the foundation laid in k-12 education so fundamental to persistence that it continues to have a strong association with bachelor's degree attainment regardless of delay or not? What academic factors do these students experience in college that are more likely to be associated with persistence?

Non-traditional students are defined as those who possess at least one characteristic that makes them distinct from traditional students (Bean & Metzner, 1985). The present study will focus on those students who delay college as a proxy for non-traditional students generally. This demographic represents the largest number of students defined as non-traditional (National Center for Education Statistics, 2008), and

offers the most interesting test of Adelman's theory given the chronological distance from the high school curriculum for these particular students. The Beginning Postsecondary Students Longitudinal Study (BPS) by definition includes students who delay as the survey begins with postsecondary entry and is not tied to either age or recent high school attendance as other studies from the National Center for Education Statistics are (e.g., High School and Beyond-HS & B). Further, the use of the BPS data will enable the researcher to determine if Adelman's results hold true for a distinct population of students.

The study will go a step further than the *Original Toolbox* to examine factors that occur during the college experience in an effort to offer information to support these students once they are enrolled. Other studies have identified many factors which occur *during college* as important to degree attainment (Kuh, 2008b; Pascarella & Terenzini, 2005; Tinto, 1993). Several researchers have pointed out the importance of institutional impact on retention (Braxton, et al., 2004; Braxton & Mundy, 2001; Kuh & Documenting Effective Educational Practice (Project), 2005; Tinto, 1993). The organization and mission of the institution with regard to fostering the persistence of students need to be driven by research about the disparate populations that require support. Specifically, this study will examine the impact of the faculty on these students as the faculty has been identified repeatedly as a significant force in the literature on traditional students with regard to persistence to degree (Pascarella & Terenzini, 1976, 1979; Pascarella, Terenzini, & Hibel, 1978). While these studies have focused on traditional students, will the results be similar for students who delay enrollment?

An informed understanding based on statistical analysis of a national dataset will offer guidance to institutions that serve this cohort regarding support and services better designed to promote degree attainment. For instance, we know that these students are less likely to live on campus and that this factor is strongly associated with bachelor's degree completion (Astin & Oseguera, 2002; Chickering, 1974a). If critical persistence factors for this population of students can be identified, those who service students and those who determine policy can know where their support and efforts will have the greatest impact on the persistence of this population.

Significance of the Research

Given the importance of degree completion and the difficulties encountered by the growing cohort of students who delay their entry to college, it seems prudent to study this cohort in an effort to better understand those variables which can be manipulated to increase the probabilities of attaining a bachelor's degree. This is likely to include public policy changes for both secondary and postsecondary education as the nation moves forward to what Trow (1988) termed *universal access*. Few researchers have studied this group at a macro level as the phenomenon is relatively new, but the forces external to the institution (demographic shifts, the importance of a bachelor's degree in a technological age, and societal demands for access and an educated citizenry) certainly indicate that it is a cohort that is here to stay and likely to grow. "Having more information on the consequences of student choices may help institutions design counseling interventions and other programs that can influence students to make decisions that improve their chances of persistence" (King, 2003, p. 69). This paper attempts to provide insight into

behaviors and needs of students who have delayed college attendance, with the intention of informing improved educational practice.

In an issue of *New Directions in Higher Education* devoted to the changing students in higher education, King, Anderson and Corrigan (2003a) ask important questions that should sensitize higher education to the accelerating changes and their consequences. “What are the effects of the new reality on the quality of the student experience? Which students are more likely to attend college in nontraditional ways? How should policy makers and institutions respond” (King, et al., 2003a, p. 1)?

Each cohort (as defined by specific demographics) may have distinct persistence factors which will complicate the role of institutions (both secondary and post secondary) with regard to being able to foster persistence for all of those who desire the benefits that accompany a bachelor’s degree.

No one answer will be right for all students, but every student can be helped by having a clearer understanding of the costs, benefits and potential pitfalls associated with the various options. Such a shift in thinking will help individual students reach their academic goals and may free up vital space and resources at institutions that must accommodate a large influx of new students. (King, 2003, p. 83)

The importance of this study lies in a better understanding of preparation and support for students who have been underserved by education in the United States. Few studies have focused on this growing group of students (King, et al., 2003a) who are changing the postsecondary landscape. As the demographics shift for college students,

the importance of research for and about these new students is clear. “Policy makers and college and university leaders have shown increased interest in adult learners as they have become a key component of the long-term persistence of the knowledge-based economy” (Paulson & Boeke, 2006, p. 1). Yet, only a few studies have focused on these new students exclusively, or in comparison to the traditional students (Metzner & Bean, 1987; Wlodkowski, Mauldin, Campbell, & Lumina Foundation for Education, 2002). This cohort of delaying students continues to grow (Anderson, 2003; Hearn, 1992; Hussar & Bailey, 2008), and institutions of higher education cannot afford to continue to focus on the traditional students at the expense of the non-traditional students. According to Berger and Lyon (2005), individual institutions are beginning to give serious consideration to this issue.

Once demand increased and student bodies diversified, colleges responded by paying more attention to retention. Such interest was general at first but increasingly became more nuanced and complex as campuses focused on retaining a more diverse range of students in terms of ability, preparation and background. (p. 2)

This mix of students will put unprecedented pressure on institutions as more diverse students will mean more varying and sometimes conflicting demands.

Within a talent development model, which has become more prevalent on college campuses, it is believed that all students can succeed with the proper support. Retention is about developing a climate that is conducive to students as well as helping students to make appropriate choices that make them successful. (Braxton, et al., 2004, p. xii)

Further,

The toolbox metaphor... says that if we are disappointed with uneven or inequitable outcomes of postsecondary education, we must focus our efforts on aspects of student experience that are realistically subject to intervention and change...we do have the tools to provide increased academic intensity and quality of pre-college curricula, to assure continuous enrollment, [and] to advise for productive first-year college performance. (Adelman, 1999, p. xi)

The metaphor demands pragmatism; the driving interest is to "to discover those aspects of student and institutional behavior that actually can be changed to improve the odds of attainment [for students who delay college entry]." (Adelman, 1999, p. 4)

Hearn (1992) makes clear the importance of reducing not just the barriers to entry, but also the barriers to persistence for non-traditional students. "From a policy perspective, the many benefits of widening higher-education opportunity to previously disadvantaged populations are potentially compromised by the extent to which those populations' attendance patterns are directed toward part-time, delayed, and nondegree-granting options" (p. 658).

The results of this study will offer valuable information for public policy regarding college access and persistence considering the K-16 discussion, especially for public school districts less likely to graduate students who will enroll directly in college. Studies have already recognized the association between secondary educational choices and subsequent persistence in bachelor's degree programs (Adelman, 1999; Adelman,

2006; Astin, 1971); perhaps a better understanding of the consequences of these decisions will inform professionals and policymakers in the secondary arena with regard to curricular changes and advisement. Much has been written about the disconnect between the secondary and postsecondary systems in the US (Conley, 2005; Kirst, 2004; Venezia, 2003), but public policy has been slow to change in most states. With such a high percentage of the public eventually attending institutions of higher education, it is remiss for both sectors to remain isolated. For school districts that do not send a large number of students directly to college, the issue of preparing students for college may not seem relevant. Perhaps the changes in college demographics (non-traditional students) will encourage these districts to rethink the levels of preparation and the K-16 connection. There is a gap in the literature with regard to the academic preparation of students who delay and why these students fail to persist to graduation (Paulson & Boeke, 2006). The present study seeks to remedy this gap in a meaningful way.

Research Question

What academic factors relate to student persistence? Do the relationships vary between those students who delayed and those who did not delay their entry?

Subsidiary Questions

1. What pre-college academic factors are associated with student persistence? Do the relationships differ for students who delay as compared with those who don't delay?

2. What academic college experience factors are associated with student persistence? Do the relationships, particularly between faculty contact and student persistence, differ based on whether or not the student delayed?

Organization of the Dissertation

This study will utilize the most often cited and supported research to identify the critical persistence factors for retaining students who delay college entry to bachelor's degree completion. The research will come from academic journals, government reports, foundation reports, and books. The literature review of this research will begin with general retention and degree attainment resources and become increasingly focused on the possible persistence factors for non-traditional students as represented by those students who delay college entry.

Definitions of retention will be examined, focusing on the choice of the definition used for this study. The importance of system persistence will be explored. The tools appropriate for the study of this type of persistence, national surveys, will be highlighted.

The next section will focus on the various types of persistence theories and the models that have been built using these theories. The review will then focus on the critical variables discussed in the literature regarding persistence, and more specifically degree attainment. The critical factors most often studied, including demographics, high school academics, college experiences, and college academics will be explored, first as they apply to the general population of college students, as well as how they apply to the population under study, those students who delay college entry. This completed literature

review will set the groundwork for a proposed model for studying the persistence of the delaying student.

The proposed model will be tested in the manner detailed in the methodology chapter, using the statistical technique of logistic regression. After all data are cleaned, and descriptive statistics are run, the logistic regression will test the association of the variables.

The discussion of the results and implications for policy and further research will follow as is required of dissertation research.

The contribution of this research is to identify factors that contribute to the persistence of students who delay college entry with a specific focus on academics, with regard to preparation and faculty interactions.

CHAPTER II

LITERATURE REVIEW

An examination of the literature will help to guide the present study. Published research will aid the researcher in selecting the statistical techniques and variables to study in order to build the best model with regard to determining critical academic persistence factors for those students who delay college entry.

Persistence

Persistence in college is variously defined as retention from semester to semester, from year to year, or as bachelor's degree completion. The societal benefits of attending college multiply for those who complete their degree requirements and, increasingly, studies of persistence across institutions- at the system-level- define persistence as bachelor's degree attainment (Astin & Oseguera, 2002). Persistence has been studied from the positive and the negative perspectives. Attrition research is quite similar to persistence research in terms of policy recommendations designed to make more students earn a degree; however, the study of dropout is in many ways distinct from the study of persistence. Although the studies of both attrition and persistence are student-centered, and measure behaviors and decisions; persistence studies are generally more forward-focused, whereas the attrition literature explains decisions and behaviors that have already occurred. The present study will include citations from attrition literature where appropriate, but will always favor the positive language associated with measuring

persistence as opposed to measuring failure or dropout. Early studies used even more negative terms such as academic mortality (Slocum, 1956), autopsy studies (Knoell, 1960) and comparisons to suicide (Spady, 1971; Tinto, 1975) to denote those students who did not persist.

Braxton and Mundy (2001) define retention as an ill-structured problem: one with no simple solution. This requires a multitheoretical approach (many constructs being considered simultaneously). A complicated set of variables interact during the college-going process and many theoretical concepts must be considered to fully understand the problem. Some theories have been criticized for their simplicity, and adding complexity has often increased the ability of a theory or model to predict outcomes (e.g., Braxton and Lien (2000b)'s expansion on Tinto's Theory of Fit). However, Astin (1971,1984) would argue the merit of those theories that are simpler. Certainly there is merit to both views; the college-going process is a complex one that occurs during a turbulent time in young adults' lives (whether they delay or not), but the power of a simple construct to explain a complex problem is of great value to increasing the understanding of complicated issues beyond the research community. The present study aims to combine a few studies based on the efforts of previous researchers in order to better understand the factors that might be critical to the persistence of students who delay college entry. The result is likely to be neither as simple as Astin's theory and model (Astin, 1984), nor as complex as the expansions on Tinto's theory (Berger & Braxton, 1998).

History of Persistence Research

In Spady's seminal article, "Dropouts from higher education: An interdisciplinary review and synthesis" (1971), his model is credited as the first to note the importance of the interaction of the characteristics of the student and the characteristics of the institution. "If the student and the environment are congruent in their norms, the student will assimilate both socially and academically, increasing the likelihood of persistence" (Berger & Lyon, 2005, p. 19).

Many researchers have followed Spady, often using the theoretical foundations of various disciplines. The study of higher education, like many of the newer disciplines, borrows from other disciplines as theories for the new discipline are defined. For instance, Vincent Tinto, a sociologist, developed a theory- Tinto's Theory of Fit (1975, 1993)- that viewed college persistence through the lens of his field- sociology. Tinto's work is based on the interactions between people and between groups of people. He believes that it is these relationships that define and predict how students will behave in the college environment. He specifically identifies the importance of the communities that the student belongs to. Tinto's work is identified as interactionalist theory, whereas researchers such as Alexander and Eckland (1977) and others (Sewell & Shah, 1968b) look at persistence through the sociological lens of status attainment (Bourdieu, 1977). Other researchers have chosen an economic lens (St. John, 1990), a psychological lens (Bean & Eaton, 2001), or an organizational lens (Bean, 1980; Berger & Milem, 1999).

Retention has been widely studied in the past thirty plus years. Respected persistence expert Vincent Tinto (1993) ties this interest to a predicted, yet unrealized, decline in undergraduate enrollment that haunted academe.⁵

As a result of the predicted declines in traditional-aged college students, college and university administrators became interested in student retention as well as student recruitment. Student attrition became a frequent topic of inquiry during the late 1970s and 1980s, and research in this area has continued (Bean, 1980; Braxton, 2000; Noel, Levitz, & Saluri, 1985; Pascarella and Terenzini, 1991; Tinto, 1993). (Berger & Lyon, 2005, p. 1)

Berger and Lyon (Berger & Lyon, 2005) also interpret the increase in retention studies as a response to advances in research as well as demographic changes.

The study of retention expanded rapidly in the 1980s. This expansion was fueled in part by the conceptual and empirical contributions to knowledge that had been made in the 1970s, but the practical realities of demographic shifts were the main drivers of sustained and expanding interest in retention. (p. 20)

The history of persistence research has demonstrated advances both with regard to methodologies- increasingly sophisticated models and research techniques- as well as increasingly complicated theories that draw from several disciplines. Various social, political and economic factors have demanded a focus on higher education, not the least

⁵ This predicted decline never actually occurred as the non-traditional students filled in the gaps made by decreases in the traditional student population.

of which is a moral obligation to identify factors associated with degree attainment. The present study recognizes the importance of developing a model to identify critical persistence factors for a growing cohort of students (non-traditional) who have been marginalized in institutions that are slow to change and are still largely focused on the academic structures and services which evolved for traditional students.

Definition of Persistence

Institutions have to work hard to keep students, and to be really successful at retention requires an understanding of why students leave, or what motivates them to reenroll. Tinto (1993) notes that, "Successful retention efforts are difficult to mount, if only because of our continuing inability to make sense of the variable character of student departure" (p. 2). Not only does the character of student departure vary, but the students are also changing within their groups and new groups are being formed constantly as the demographics in the United States shift in important ways.

How we choose to define persistence is of critical importance. Many researchers note the importance of defining retention, as the many nuances involved in such a comprehensive, longitudinal process can change the direction of the research and prevent studies from being able to be compared with one another. Astin (1984) warns, "Investigators who claim to be studying the same problem frequently do not look at the same variables or employ the same methodologies" (p. 297). Even the details of the investigation are of critical importance: "Data definitions and limitations must be

carefully understood before findings are reported, conclusions are drawn, and recommendations are made" (Mortenson, 2005, p. 58).

According to Seidman (2005), "retention is defined as student attainment of academic and/or personal goal(s)" (p. 296). Persistence is the study of individual students and their staying at an institution of higher education (or multiple institutions within the larger system of higher education) until they either attain a degree, satisfy their personal goals, or leave higher education completely. The definition of persistence is not universally agreed upon, despite the general agreement of all parties involved as to the importance of students persisting to their goals. The student is at the center of all of these representations. According to Adelman (2006), "The locus of responsibility for the way each of these variables will tilt lies as much with the student as with external forces" (p. 22). Although the student is at the center, the end goal of the studies is to identify those forces which positively and negatively affect student persistence in the aggregate. Identification of these factors will ultimately help practitioners to change policy in ways that will facilitate the persistence of more students.

Vincent Tinto (1993) refutes the negative connotation associated with leaving college. Many students attend classes without the goal of attaining a degree; therefore their leaving college is not a symbol of failure, but they "rather see their time in postsecondary instruction as a positive process of self-discovery that has resulted in individual social and intellectual maturation" (Hagedorn, 2005, p. 91). Bean (1990) and Alfred (1973) also note the importance of considering the educational goals of the student

when defining retention. Tinto (1993) would prefer that goals be considered and recorded at the time of enrollment so that retention numbers could be more accurate. It makes little sense to be concerned about the retention to graduation of students who never intended to achieve a degree. The present study will filter out the students who do not have a goal of earning a degree from the studied population. The Beginning Postsecondary Survey asks the respondents about their educational goals and this question will be used to eliminate the students who are not interested in earning a bachelor's degree.

The distinction between involuntary attrition (leaving) as demanded by an institution for academic or disciplinary reasons, and voluntary attrition where a student has the ability to decide to stay or go and chooses to go, is also important. Circumstances dictate a continuum of sorts between the clear choices to leave as dictated by the student or the institution and the not so clear choices (for instance, changes in financial aid may require a student to reevaluate the decision to persist, family circumstances sometimes demand or encourage a student to leave or to persist); many of these factors to be considered are influenced to some extent by forces external to both the student and the institution. The present study will consider both voluntary and involuntary leaving. There are a few questions available in the survey which can help to identify reasons for not re-enrolling from which inferences might be made about the nature of the withdrawal. GPA can be used to infer a lack of academic persistence, but this lack of persistence might be rooted in external pressures which are especially salient for those students who delay college and have more adult commitments. Given that these students had a

bachelor's degree goal and that the focus is academics and academic preparation, leaving in any fashion represents the antithesis of persistence for these students.

Equally important is the timeframe of the study. As students take an increasingly longer time to complete their degrees (National Center for Education Statistics, 2008), the period of study must be considered when comparing results, most especially for populations more likely to have a mean time to degree that is distinct from the general population of college students. Average time to degree is not something that researchers agree on.

College graduation rates for those who start college may be decreasing or increasing, depending on the data set used. Or, if one uses the longest data set (from the Census Bureau), college graduation rates may be unchanged over the last fifty years. (Mortenson, 2005, p. 43)

Changing patterns of enrollment complicate the issue of agreement with regard to time to degree, where data are "particularly affected by lengthening time to degree and student enrollment at multiple institutions during their undergraduate careers" (Mortenson, 2005, p. 44). Mortenson graphically compares graduation rates using ACT data, NCAA (National Collegiate Athletic Association) data and Census data and finds that the distinct populations as defined by the data sets produce not only dramatically different rates of graduation from year to year, but the trends produced by the data are quite distinct for each data set. "In these three widely used data sets there are differences in timeframes, definitions, samples, methods of data collection, units of measure, and perhaps reliability

of reported census data” (Mortenson, 2005, p. 47). Linda Hagedorn (2005) further notes the complication of studying retention when rates are reported for different periods of time depending on the source. “Typically colleges and universities report 4-year rates, while ACT publishes [five]-year rates, and the National Collegiate Athletic Association reports 6-year rates (U.S. Department of Education, 2003)” (Hagedorn, 2005, p. 92). Again, the definition of retention and timeframe determined by the study is of critical importance with regard to the ability of the study to be compared with other studies. The timeframe of the present study is determined by the dataset. The BPS cohort period is 6 years from the start of postsecondary studies.

Scholars choose different definitions of persistence or retention for their studies based upon the dynamics of the population they are interested in, the constraints imposed by their choice of data source(s), their statistical tools, and other important factors. For example, Astin and Oseguera (2002) studied degree completion in a manner that is somewhere on the continuum between institution and system persistence. “We have limited this study to degree completion at the institution of initial entry because the Student Right-to Know and Campus Security Act, as well as most individual institutions, continue to define retention in this way” (Astin & Oseguera, 2002, p. 4). They looked at institutional degree completion through the lens of the Cooperative Institutional Research Program (CIRP), a system data set as it made sense for the particular context of their study.

Persistence research can be student-centered, institution-centered or system-centered. Studies done for institutions about their own students have great value for the institution, and these studies can offer much in the way of identifying variables that can be examined in studies of larger populations of students. Institution-centered studies are of great value as they recognize that many of the important interactions with regard to retention can be institution-specific. Student-centered studies try to predict persistence based on the attributes of individual students and the experiences these students have post-enrollment. System-centered retention studies recognize that students are often enrolled in more than one institution, and that a more comprehensive study of students can help to identify factors which are important to students in general. The present study will be a system-centered study that uses a national data set as its source of evidence, but is focused on determining critical persistence factors for a specific population of students (thereby making it student-centered) by studying that population in its aggregate form. Student-level data are provided in the dataset, but descriptive and inferential statistical manipulation used to identify persistence will allow the researcher to draw conclusions that are both generalizable and useful for policy makers.

The present study will examine system persistence using the Beginning Postsecondary Student Study (BPS) and will be constrained by the parameters inherent in that national dataset with regard to survey timeframe. Persistence will be defined as having attained a bachelor's degree, or still being enrolled at the end of the cohort period of 6 years.

Persistence is measured in a variety of ways, semester to semester reenrollment, academic year to academic year, and degree completion. The economic difference between bachelor's degree holders and high school diploma holders has been identified in several studies (Aslanian & Brickell, 1980; Conley, 2005; Gladieux & Swail, 2000; Perna, 2003). A number of studies count bachelor's degree completion as the dependent variable (Alexander, Riordan, Fennessey, & Pallas, 1982; Arbona & Nora, 2007; Astin, 2006; Pelavin & Kane, 1990). Adelman notes that for his studies degree completion is the dependent variable. "Degree completion is the true bottom line for college administrators, state legislators, parents, and most importantly, students- not retention to the second year, not persistence without a degree, but completion" (Adelman, 1999, p. v). In an often cited article about the disparity of educational opportunity in the United States for poor and minority students, Gladieux and Swail (2000) assert, "Our most important message to policy makers and postsecondary leaders is to focus on student persistence, not just access- persistence to a degree, not just getting students in the door" (p. 688). Further,

Postsecondary participation has soared during the last quarter of a century, but the proportion of college students completing degrees of any kind has remained flat. Given the growing diversity of students and the increasing complexity of their attendance patterns, stable completion rates may be more than we could have reasonably expected. But we need to do much better. (Gladieux & Swail, 2000, p. 689)

The students who delay are more likely to take a non-traditional path to degree completion and are thus more likely to stop out for a time on their way to degree. Taking just one semester away from studies is the definition of stopping out, and due to external pressures (family and economic responsibilities) non-traditional students are more likely to choose to not reenroll each and every semester. Stopouts and part-time attendance increase time to degree and can be very real barriers to degree attainment. For these reasons, it is more appropriate to study the persistence of these students within the context of degree attainment. With regard to the specific population of students who delay college entry, defining persistence is a conundrum. "Measuring persistence is a very difficult matter. There is widespread agreement within higher education that graduation rates are an inadequate measure, especially for adult learners, but there is little consensus on alternative metrics" (Paulson & Boeke, 2006, p. 30).

While the gates of the university have swung open for an increasingly diverse array of students and the access gaps between non-minority and minority students and between low-income students and those of more significant means have closed significantly, the corresponding gaps in degree attainment have grown wider over time (Gladieux & Swail, 2000; Pelavin & Kane, 1990). "The most advantaged students graduate at much higher rates than their less-advantaged counterparts: 40 [percent] of students in the top income quartile graduate with a 4-year degree, compared to only 6 [percent] of students in the lowest income quartile" (Gladieux & Swail, 2000, p. 690). This presents a concern for equity in higher education, and for the present study, as

students who delay are statistically more likely to come from minority or low-income backgrounds and therefore be less prepared to do well.

System Persistence

Two types of persistence have been studied in general, institutional retention (which considers an individual's interaction with a single institution -many institutional studies have been done as it is widely recognized that many of the important variables may be institution-specific), and system retention. Many students attend more than one institution prior to graduation. This trend, in concert with the high rates of transfer between institutions, encourages researchers to study what is known as *system* retention (Tinto, 1993), or *summary* persistence (Mortenson, 2005). In fact, where persistence is being studied, there is almost always the possibility that a student could return. Noted researcher Alexander Astin (1975) makes clear the complications with regard to classifying students as dropouts or non-dropouts as their status cannot be finally ascertained until they either graduate or die.

System retention focuses on the student and is unconcerned with the institution(s) that the student is enrolled in. Using system persistence as a measure, a student who leaves one institution to attend another is considered a persister. Therefore, system persistence accommodates the frequent occurrence of transfer, co-enrollment, or reenrollment at another campus, in another state, or in another institutional type. (Hagedorn, 2005, p. 98)

Choy (2002) found the institutional persistence rate at 4-year schools to be 56 percent, whereas the system retention rate was found to be 76 percent, reflecting the substantial amount of transfer activity between institutions. Given a documented shift toward attending more than one institution of higher education prior to graduation (King, Anderson, & Corrigan, 2003b; McCormick, 2003), the study of system retention is warranted. Students transfer from one institution to another, attend two institutions in the same year, in patterns known as “swirling” (de los Santos & Wright, 1990), or “double-dipping” (Gose, 1995)- alternating attendance or simultaneous attendance, respectively. The portability of credits created by the standardization movement in the late nineteenth century (Cohen, 1998; Levine, 1978), created the opportunity for treating credits as academic currency (McCormick, 2003) which students take advantage of for many reasons.

For the student who is challenged financially, taking courses at another institution may be a way of saving money. Indeed, in an article about student attendance patterns, McCormick (2003) identifies eight possible patterns of enrollment before even considering institutional type or number of credits involved. He also reports:

Limiting the analysis to bachelor's degree recipients, regardless of where they first enrolled, Adelman found that multiple institution attendance rose from about half of the 1972 cohort to about three-fifths of the 1982 cohort. Interestingly, the proportion of bachelor's degree recipients who attended two institutions was relatively stable between the two cohorts (36 to 37 percent); most of the increase

came from students attending at least *three* institutions, rising from 13 to 22 percent. (McCormick, 2003, p. 16)

Non-traditional students, by definition, are less likely to attend college in a traditional manner. The identification of higher education as a commodity (Zemsky, et al., 2005), combined with more immediate external factors such as family responsibilities and the financial concerns of independent students, drive these students to make unconventional choices. In other instances, the non-traditional student may be examining the value of their educational experiences in a manner quite distinct from their traditional counterparts. For instance:

Those who work during the day find that community colleges, which cater to students of all ages, are more likely to offer classes at night or on weekends. Some say the overcrowded classrooms at their universities, and the professors they call uninspired are not worth the extra money. (Gose, 1995, p. A27)

The present study will be student-centered, but will be considered using a source of evidence for system persistence as the cohort is less likely to follow a traditional path through college.

Theories of Student Behavior and Persistence

The history of persistence research and methodology is one of increasing complexity with regard to the phenomenon studied, as well as the manner in which it has been studied. The main classifications of theories are relatively straightforward and offer a window on the issue of student persistence from a perspective that is closely related to

one or more of the disciplines that much of higher education theory is based on. As persistence research became more popular, and the available statistical techniques more complex, the theories and models became more complicated as well. Many of the theories which explained persistence incompletely were married with other theories to better understand the phenomenon and to increase the explanatory power of the models.

The main classifications of persistence research are psychological theories, organizational theories, economic theories and sociological theories (Braxton, et al., 2004; Chen, 2007,2008).

Psychological. The psychological theory of persistence maintains that it is the characteristics of the individual student that drive persistence behavior (Bean, 1980,1982a,1982b; Metzner & Bean, 1987). Students make choices about the college experience based on their level of maturity and perception of their own intellectual abilities. These theories are based on more general psychological models of behavior such as attitude- behavior theory (Bentler & Speckart, 1979; Fishbein & Ajzen, 1975), the coping behavioral (approach-avoidance) theory, self-efficacy theory (Bandura, 1997) and attribution theory (Bean & Eaton, 2001). The models that researchers use to test these theories are based on intermediate constructs such as satisfaction with various aspects of the college experience and a stated intention to depart or to stay (Bean & Eaton, 2001). In other words, persistence behavior is associated with stated intentions, which are associated with satisfaction which is, in turn, associated with individual student characteristics that are psychological in nature, such as self-efficacy and maturity.

Researchers have focused on psychological characteristics such as locus of control, self-efficacy, and a need for affiliation. Each of these characteristics exists on a continuum, and can be associated statistically with persistence or not. An external locus of control means that a student feels that his or her actions do not have import on outcomes in their lives; this has been demonstrated to have a negative association with persistence (Bers, 1988). "Students with an internal locus of control are more likely to participate in beneficial activities because they believe that they are potent actors in the world they inhabit and are not acted upon by others" (Bean, 2005, p. 221). Self-efficacy is closely related to locus of control, but more specifically pertains to the students' perception of their ability to engage in those actions that will have import on outcomes (Bandura, 1997; Peterson, 1993). Bean and Eaton (2000,2001) have found that self-efficacy has a positive influence on persistence in college. "A strong sense of self-efficacy...enables a student to gain confidence in his or her ability to survive and adapt.... Here reciprocal and iterative processes build a foundation from which the student gains confidence and motivation to persist to graduation" (Bean & Eaton, 2000, p. 53).

Many people have a need for affiliation with others (Stern, 1970). Intuitively, this need would suggest a positive association with persistence in most institutions; however Pascarella and Chapman (1983b) found that *in nonresidential institutions*, the need for affiliation is directly and negatively associated with persistence.

Organizational. There is a body of persistence theory that is based on organizational theory and focuses on the impact of the college environment on student

persistence behavior (Berger & Milem, 2000; Pascarella & Chapman, 1983b). Bean's (1980) theory of persistence is based on turnover studies from work organizations (March & Simon, 1958; Price, 1977). It focuses on the nature of the organization as the most important set of factors in the interaction with the student. Factors such as the location (urban, suburban or rural), the size of the enrollment (number of students enrolled), Carnegie classification, control (public or private) and religious affiliation are associated with persistence in different ways for different students. Single institution studies of persistence highlight the importance of this body of theory, as they signify the importance of the characteristics that identify the institution.

Engagement and involvement. The organizational theory of persistence has given rise to two newer theories of student behavior. These theories identify the effort of students in creating their own outcomes which are truly student-centered. "What students do during college counts more in terms of desired outcomes than who they are or even where they go to college" (Kuh, 1994, p. 1). Engagement is a study of student behavior in the context of the environment wherein the efforts of the students impact their outcomes. Student participation in "educationally purposeful activities" drives a student toward both satisfaction and positive outcomes (Zhao & Kuh, 2004). Researchers have used this student behavior theory to study freshman year persistence (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008), and institutional retention rates (Laird, Chen, & Kuh, 2008), as well as graduation rates for underserved populations (Kinzie, Gonyea, Shoup, & Kuh, 2008).

What Kuh and his associates identify as engagement (Kuh, 2005,2008b) is similar to what Astin terms involvement (Astin, 1993). Astin defines student involvement as "the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1984, p. 297). Astin compares his concept to what learning theorists define as "vigilance or time-on-task. The concept of *effort*, although much narrower, has much in common with the concept of involvement" (Astin, 1984, p. 298). Unlike most studies about persistence, Astin (1977) found that involvement, as he operationalized it, actually overcame entering freshman characteristics with regard to student persistence. This occurred through changes in the student outcomes such as increasing self-esteem, increasing cultural interests, more liberalism and a tendency to become less religious. Students who experience these changes are more likely to be satisfied with their undergraduate experience and also were found to be more likely to persist. Using the intermediate outcome of satisfaction, this theory also combines interactionist theory with psychological theory in an attempt to better understand persistence.

Both of these important researchers recognize the necessity of connecting their theories to the organization of the institution (Astin, 1984; Kuh, 2001b; Kuh & Documenting Effective Educational Practice (Project), 2005), and in putting the results of empirical evidence into practice to improve the student experience.

Economic. The economic theories of persistence fall into two general categories: (a) human capital, and (b) the laws of supply and demand. Human capital theory assumes that students are rational actors with the goal of maximizing their worth through

investing in themselves- including education (Becker, 1980). In effect, if the costs of attending outweigh the benefits of attendance, the student is likely to leave. The laws of supply and demand dictate that as the price of most items increases, the demand will decrease as the items will become out of reach. The ability-to pay model (Cabrera, Stampen, & Hansen, 1990) and the nexus model of student choice and persistence (St. John, Paulsen, & Starkey, 1996) were developed from these economic theories. Like persistence research in general, the study of the economics of persistence has become increasingly complex. From a simplistic examination of financial aid as a dichotomous variable (Murdock, 1987; Stampen & Cabrera, 1986), the analyses have become increasingly sophisticated with regard to the amount of aid (Schuh, 1999), the amounts of each type (Leslie & Brinkman, 1987), and even the variability of each type of aid when considered along with student demographics (Chen & DesJardins, 2008). Additionally, the costs of college have been studied in conjunction with persistence and scholars have found an inverse relationship of costs or net costs to persistence (St. John & Starkey, 1995). The longitudinal nature of the financial aid process has even been exploited in an effort to determine the differential impact of student aid over time (Chen & DesJardins, 2008; DesJardins, Ahlburg, & McCall, 1999).

Sociological. The sociological theory of persistence is grounded in social capital theory (Bourdieu, 1977) which purports that social status is based on the class structure and the family's place in society. Status attainment theory is based on this and has been the basis of many a persistence study (Alwin & Otto, 1977; Sewell, Haller, & Portes, 1969; Sewell & Shah, 1968a, 1968b). The ideals of American society support the idea

that any individual can be successful with hard work, but the reality is not always so. The lack of equity in higher education continues to get attention in the popular press (Das, 2006) and government reports (Department of Education, 2008), as well as in more academic publications (Gladieux & Swail, 2000). Persistence studies with a sociological foundation are the basis for understanding and remedying the lack of equity in American higher education.

Included in this body of theory is the process of anticipatory socialization. Students participate in “getting ready” behaviors (Attinasi, 1989; Nora, Attinasi, & Matonak, 1990) which can influence their satisfaction with the institution based on the expectations generated. Having parents who attended institutions of higher education is also an important consideration and has been found to have a positive association with persistence in higher education (Pascarella, Pierson, Wolniak, & Terenzini, 2004). Tinto’s interactionist theory is also an example of a sociological theory of persistence.

Tinto’s Student Integration Model. The interactionist theory is much like the organizational theory in that it is focused on the interactions between the individual and the institution. More specifically, this theory specifies that the individual and the institution interact in ways that affect the commitments the individual makes to the institution, as well as to continuing in higher education (Tinto, 1975).

Often ascribed to Vincent Tinto, this theory has its roots in Durkheim’s theory of *Suicide* (1951) and Van Gennep’s *Rites of Passage* (1960). Tinto credits Spady (1970,1971) as the originator of this theory. Spady (1970) recognized a need for an

underlying theoretical frame for the study of retention of college students. The issue of retention had been studied for many years, but it was after Tinto's 1975 article in the *Review of Educational Research* that the theory became known as his and began to be used by other scholars as a foundation for much of the retention literature. The theory proposes:

Colleges and universities are like other human communities; that student departure, like departure from human communities generally, necessarily reflects both the attributes and actions of the individual and those of the other members of the community in which that person resides. (Tinto, 1993, p. 8)

Tinto's theory (1975,1982,1993) has been noted in more than 775 citations (Braxton, et al., 2004). It is both widely cited and often criticized, but the impact of Tinto's ideas on the dialogue about student persistence cannot be disputed. Braxton, Hirschy and McClendon (2004) concur, "Paradigmatic status connotes the considerable consensus among scholars of college student departure concerning the potential validity of Tinto's theory" (p. 7).

Tinto's theory postulates that the key to persistence for students in postsecondary education is integration in all aspects of the experience. The theory states that students must separate from past forms of association, experience a transition to the college norms and groups (both academically and socially), and then become incorporated into the college communities (Tinto, 1993). Otherwise known as Tinto's theory of fit, the implication is that not all students experience a good fit at their chosen

postsecondary institution. Tinto's theory also requires that students relinquish ties to their former communities and build new ones within their institution (1975,1982,1993). "Successful integration into the campus environment should have a positive impact on student satisfaction and persistence" (Hossler, 2004, p. 74).

Fit is a form of social comparison (Schwartz, 2004). It is requisite to integration. If students cannot find an institution where they believe they can fit in, they will certainly not be able to become integrated into the new community. It is as though the expectation of positive social comparison (college choice) is being balanced against the reality of that same comparison (fit in the retention literature). "Whether or not a student stays... is related to the degree to which the student fits in with the environment" (Choy, Ottinger, & MPR Associates, 1998, p. 3).

Tinto believes that each interaction with the new environment creates a new expectation for the next set of interactions. This is akin to the theorists like Pike (2006) who study student expectations and who realize that these expectations are "dynamic". Pike (2006) also recognizes that expectations "influence how students respond to their environments" (p. 806). Other researchers feel that "our expectations about events often influence how we feel about and understand events, and how we choose to respond to them" (Jackson, Pancer, Pratt, & Hunsberger, 2000, p. 2101). Tinto believes that these interactions determine the levels of commitment on the part of the student both toward the institution and toward the goal of earning a degree.

Central to Tinto's theory are the constructs of academic and social integration, each of which have structural and normative dimensions (Tinto, 1975). The efforts to improve all aspects of the undergraduate experience are integral to the persistence of the students and the institution. "Enhancing student life on campus facilitates recruitment and retention" (Hossler, 2004, p. 76). For certain populations of students, integration may be more complicated, as it demands cultural changes and awareness. For instance, Native American students who attend the University of Arizona come to a huge public university from a very small rural community and are overwhelmed. In response, the university has developed a "living-learning model, which houses and educates students together, mimics Indian values by fostering a family atmosphere" (Andazola, 2007, p. 11). For the non-traditional student, the constructs of academic and social integration are posited to be experienced differently, and in such a way as to affect their persistence to completion.

Tinto's theory has inspired much discussion, both positive and negative. In response to criticism, Tinto's 1975 version of the theory was later expanded to consider the effects of external commitments (Tinto, 1993) (this will be an important concern considering the specific population of the present study). The 1993 version of the theory also lends more credence to the economic theories of persistence in that it considers financial circumstances as part of the student's precollege attributes. Other researchers have taken up where Tinto left off and have improved on Tinto's original theory and model. Stage (1988) used a combination of logistic regression and LISREL to validate Tinto's model. Specifically, critics (Braxton & Lien, 2000b; Tierney, 1999) have

suggested that Tinto's theory has less salience for non-traditional students. Braxton and McClendon (2001) took Tinto's concept of social integration and made specific recommendations with regard to institutional practices designed to foster persistence through the intermediary variable of institutional commitment.

Enhanced Models

As the study of persistence has grown, researchers have become more sophisticated, both in terms of methodology and in combining theories in order to better understand persistence. The theories have been subjected to rigorous empirical scrutiny. Models built from a single theory or combinations of theories are examined with increasing precision as the statistical techniques have become quite sophisticated (St. John, Cabrera, Nora, & Asker, 2000).

Each theory that is listed above has limitations in that it fails to consider important factors in a highly complex longitudinal process of college-going that begins as early as high school. A combination of theories has often been used to develop models to better understand the relationships of students and higher education.

Braxton and Mundy (2001) define persistence as an ill-structured problem that can only be answered with enhanced models which consider several theories simultaneously. Whereas Tinto would be classified as a theorist (Mills, 1959), those who test the theories of others are empiricists. These empiricists look for empirical evidence to either support or refute the theory. Several researchers have so tested Tinto's theories (Nora, 1987; Nora & Rendon, 1990; Pascarella & Chapman, 1983a; Pascarella, Duby, &

Iverson, 1983; Stage, 1988; Stage, 1989b; Voorhees, 1987) and some have even done so in a manner which combines theories. Cabrera, Castaneda, Nora and Hengstler (1992) attempted to merge Tinto's theory with Bean's Model of student departure (1982a) in order to better understand student behavior. Stage (1989a) sought to combine Tinto's theory and a psychological perspective in order to develop a model that enhanced the ability to predict attrition. Hossler (1984) was among the first to note that the convergence between these two theories would offer valuable insight into student behaviors.

Braxton, Hirschy and McClendon (2004) added the Ability to Pay model (Cabrera, et al., 1990) to enhance Tinto's model. These authors also consider Tierney's (2000) framework for at-risk students. The conclusion they come to is that Tinto's theory has more support in the residential college environment where social integration is of more importance to students than in a commuter college environment where academic integration has more import with regard to retention and degree attainment.

St. John and his colleagues (2000) consider the connection of college choice and persistence, and they do so using a combination of the economic theory and the psychological theory.

Both Astin (1977)'s theory of involvement and Kuh's (2005,2008b) theory of student engagement combine more than one of the general categories of student persistence theory in an attempt to better understand student behavior. Although their

theories are not specifically classified as persistence theories, researchers have used these theoretical foundations to study various definitions of persistence.

The enhanced models are more complex, but explain more about student behaviors. They make up for the gaps of each of the major categories of theory and consider more factors that have import with regard to student persistence in general. The present study will utilize Adelman's model (1999, 2006) which was based on an understanding of the contemporaneous literature (based on studies of traditional college students), but this study will also consider the research which is specific to the persistence of non-traditional students (Bean & Metzner, 1985; Metzner & Bean, 1987). In this way, the present study is an enhanced model which considers the different theories and variables already identified in the literature, and which is specifically focused on the cohort of non-traditional students.

Adelman's framework is an empirical test of the theoretical work on academic preparation for college by Alexander and his colleagues (Alexander & Eckland, 1977; Alexander, et al., 1982). This framework focuses on academics and it was selected for the present study because of the consideration of the "academic break" that the delayers take. Since the publication of these two studies (Adelman, 1999; Adelman, 2006), educational researchers have expanded on this work, often with very sophisticated statistical techniques (DesJardins & Lindsay, 2008; DesJardins, McCall, Ahlburg, & Moye, 2002; Thomas, Alexander, & Eckland, 1979). The simplicity of Adelman's

framework is appealing in that it offers this researcher the ability to add variables that will tailor the model to a specific cohort of students of interest to this study.

Adelman's Toolbox Model

Adelman, at the time, a senior researcher with the U.S. Department of Education, determined to use data that he had available in order to test some of the assumptions of the persistence studies that he had read. His first study, *Answers in the tool box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment* (Adelman, 1999) tested various precollege variables and their statistical association with degree attainment. He found that the importance of high school academics and momentum could not be ignored. In a follow up study, *The Toolbox Revisited: Paths to Degree Completion from High School through College*, Adelman (2006) added a series of college experience variables. He found academic intensity and momentum from high school through college to be more important than any other considerations with regard to degree completion. His differential coursework hypothesis is the foundation of the academic momentum construct.

Through a progression from an exploratory study using previously identified variables to a model incorporating additional, appropriate variables, Adelman has set the groundwork for a model which might be termed the academic model of persistence. His studies consider variables that are economic or organizational in nature; but his main focus is academic momentum from what might be considered a sociological perspective. In this manner, his work is not so different from that of others who have looked at social

capital and education (Alexander & Eckland, 1977; Alexander, et al., 1982; Sewell, et al., 1969). Adelman's interest in high school academic preparation validated an assumption held by many about the importance of high school preparation. The theory relies heavily on Adelman's construct of academic momentum, which is represented by a composite variable including many high school academic factors. Adelman's studies were based on the information from a national data set which is compiled by the National Center for Education Statistics (NCES), an operation of the U.S. Department of Education. The High School and Beyond (HS&B/So) survey and a follow up survey, the National Education Longitudinal Study of 1988 (NELS: 1988) that he used to examine a later cohort of students are designed to follow high school students through the process of completing high school and then continuing on (or not) to a postsecondary education institution (these two surveys will hereafter be referred to as the NCES transcript surveys).

What did the *Original Toolbox* say?

The intensity and quality of one's secondary school curriculum was the strongest influence not merely on college entrance but, more importantly, on bachelor's degree completion for students who attended a 4-year college at any time. The highest level of mathematics the student reached in high school played a significant role in the strength of the curriculum configuration...demonstrating the power of the academic intensity of secondary school curriculum over combinations of test scores and grades. (Adelman, 2006, p. 8)

Adelman's follow up study (2006) also expanded to include during-college factors and their impact on degree attainment as well as the pre-college factors. Adelman found that extending academic momentum throughout college was also important. This is not surprising as we know from other research that the outcomes of college are the product of both the characteristics of the individual student and the characteristics of the institution in combination with the interactions along the way (Pascarella & Terenzini, 2005; Spady, 1971; Tinto, 1993).

What stands out most about Adelman's pair of studies is not that they inspired a decade of legislation about high school curriculum and graduation requirement reform, nor that they reopened the K-16 dialog (a discussion of the lack of congruence between preparation for college persistence and curricula and requirements for k-12 education), but that the findings seem so extraordinarily conclusive. Adelman identified high school curriculum as being the most important factor in predicting bachelor's degree attainment, specifically noting the importance of mathematics- "One step beyond Algebra 2 doubles the odds that you will earn a bachelor's degree" (Adelman, 2006, p. 34). Adelman found these results to be consistent, using two cohorts of one dataset that was designed to measure similar aspects of similar students in a similar manner, but for distinct periods of time (1980-1993 and 1988-2000).

Summary of Theories and Models

While the psychological theories and their models are based on the student's behaviors in reaction to the new college environment, they do not recognize factors

external to this relationship as having import in the persistence process. They largely ignore the other bodies of theory and their focal variables such as financial aid, or social integration.

The organizational theory largely ignores the importance of factors external to the connection between the student and the institution. Certainly college is a substantial expense for almost all students, and to ignore the economic realities of attendance limits the explanatory power of this theory.

The economic theory is limited in that it focuses on economic problems and responses, but largely ignores the student's attributes (psychological, demographic and academic) and the impact of the institution.

The sociological theory is primarily concerned with the interactions within the institution, particularly for the non-traditional student; this is short-sighted. This body of theory is also concerned with equity in higher education and with remedying the inequities in an effort to enhance social equity for people from all backgrounds.

The engagement and involvement theories combine the interactionalist and the organizational perspectives in a manner that helps to explain some of the issues that either theory alone does not adequately explain. In general, these theories disregard the impact of external pressures on the students, as well as the students' ability to handle the challenges of higher education.

The prominence of Tinto's theory notwithstanding, several researchers have taken issue with this theory for different reasons (Attinasi, 1989; Braxton & Lien, 2000a; Braxton, Sullivan, & Johnson, 1997; Tierney, 1999), and others have chosen to use many of Tinto's ideas to develop a more complex theory that explains more of the variance in student departure (Berger & Braxton, 1998). These authors suggest that theory elaboration, using organizational theory, would help to better explain Tinto's social dimension of integration.

Without strong empirical affirmation for the role of either academic or social integration in the departure process, the underpinnings of Tinto's interactionist theory come into question. Serious questions emerge about the influence of the outcomes of the interactions a student makes with the academic or social communities of a college or university in the student departure process. (Braxton, et al., 2004, p. 10)

These criticisms center on the constructs of academic and social integration which are central to the theory. The distinction between academic and social integration is questioned (Beekhoven, De Jong, & Van Hout, 2002), and the validity of academic integration as it is presented is questioned as it is not consistently supported when tested as defined (Braxton & Lien, 2000a; Braxton, et al., 1997).

Critics of Tinto's theory have noted that the theory works only for students in the majority, and that other populations of students use other means to survive the college experience and graduate (Hurtado & Carter, 1997; Tierney, 1999). While Tierney's

article is concerned with the persistence of African American students, Attinasi (1989) also refutes Tinto's theory as being irrelevant for Mexican American students. Braxton, Sullivan and Johnson (1997) could not find a study that tested Tinto's theory with students of different racial or ethnic backgrounds, and found that just one proposition of thirteen was supported for Caucasian students.

Other scholars (Braxton, et al., 2004; Braxton & Lien, 2000a; Braxton, et al., 1997) have concerns about the applicability of the theory to students who attend non-residential institutions. Specifically, Braxton and Lien (2000a) found inconsistencies in their study with regard to commuter institutions which suggest that Tinto's theory lacks explanatory power in these settings.

Bean (1985) notes that what is missing in Tinto's (1975,1993) theory and allied research is the role of external factors in shaping the perceptions, commitments, and preferences of students. Cabrera, Castaneda, Nora, and Hengstler (1992) make the same point. If we believe that the non-traditional student is more likely to be influenced by external forces, then this gap is of serious consequence for the present study. Although Tinto's theory has been considered to be the foundation of interactionalist persistence research, perhaps it cannot be applied to explain the behaviors of students who are distinct from the traditional students of the 1970's and 1980's. However, "researchers have found the Student Integration Model useful in exploring the influence of such external factors as significant others' influence (Cabrera, et al., 1990; Nora, 1987; Nora, et al., 1990), finances (Braxton, Brier, & Hossler, 1988; Cabrera, et al., 1990; Mallette &

Cabrera, 1991) and getting ready (Nora, et al., 1990) on persistence” (Cabrera, et al., 1992). Perhaps if we can identify which external factors are salient to a particular cohort of non-traditional students, the Student Integration Model will be of value.

The enhanced models consider several theories at a time. These models are valuable as they represent not only the combination of more than one theory, but, as models, they offer a means to empirically test the suppositions presented by the theories. Often, these models are quite complex, both theoretically and statistically. Adelman’s model is not only focused on the variables of interest in this study, but it is also conceptually straightforward.

Adelman’s model is imperfect for the specific cohort of students of interest; variables will need to be added. Adelman’s model is weak with regard to psychological variables and the interactionist constructs of academic and social integration. Psychological variables which have been identified by other studies as being important for this cohort, especially the intermediary variable of satisfaction, will be added to Adelman’s model. Tinto’s constructs of academic and social integration will also be considered, with particular attention to how the literature on non-traditional students will help to define it as being potent.

Non-Traditional Students

Students are certainly changing more rapidly than ever before, but this is not a newly recognized phenomenon. Chickering (1974a) recognized like changes in the student population. Chickering (1974a) noted then that "increased numbers of students

with diverse motivations are adding their special educational needs and purposes to those of the typical students of the past" (p. 1). He then lamented the response of higher education with regard to the needs of these new students; "in short, the response of higher education to the new social conditions and new students of the 1960s was more of the same" (Chickering, 1974a, p. 1). Thirty five years later, with a much higher level of student diversity, the response seems little changed.

Non-traditional students may choose attendance patterns that are distinct from those we consider to be traditional. Those students we consider to be traditional take a track through college which Carroll (1989) dubbed the "persistence track." This assumes fall entrance to a 4-year institution after high school graduation and continuous full time enrollment to graduation. In 1989, when Carroll wrote about the 1980 high school graduates, he found that one in five students did not fit this pattern of persistence (1989); Hearn (1992) used the same data set and found 13 distinct paths through college. Not surprisingly, Hearn found that academic preparation, SES, and degree aspirations all played an important role in the choice of path. "If one defines traditional students as residing on campus, being 18-24 years old, and attending college full-time, it is easiest, though not completely satisfactory, to consider as nontraditional students those who lack one or more of these characteristics" (Bean & Metzner, 1985, p. 488).

There are several factors that students who are statistically less likely to be persistent have in common. In general, these factors are considered barriers to persistence that students from certain backgrounds have in common. The Beginning Postsecondary Study lists these as risk factors and even offers an additive composite

variable that combines all of the risk factors to assess the total amount of risk expected for a student given these attributes. These risk factors include: coming from a low-income background, delaying college entry, not having earned a high school diploma, being enrolled part-time, being financially independent, having dependents of their own, being a single parent, and working full-time (35+ hours per week). These risk factors are descriptive of non-traditional students rather than traditional students. Often, these risk factors are interrelated and, too often, students encounter more than one barrier to persistence.

Students from low-income backgrounds are less likely to be persistent in the postsecondary environment. In general, these students are overrepresented in the non-traditional student ranks. Cook and his associates report that “Forty percent of adult students, or approximately 2.5 million individuals, have annual incomes of less than \$25,000” (Cook & King, 2004, p. vii). “Low-income adults enter college with a mix of family and work responsibilities- as well as personal and academic challenges- that make it difficult for them to succeed without highly supportive institutional and public policies” (Cook & King, 2004, p. viii). These family responsibilities distract the student from becoming integrated into the new community of college. The student might have their own dependent children or parents, which demand that the student be financially independent. These family responsibilities distinctly separate the non-traditional students from the traditional students who can often immerse themselves socially and academically in the community of the institution.

Changing Demographics

Eugene L. Anderson (2003) uses U.S. Census data to describe the importance of the changing U.S. demographic for consequential changes in the college student population.

Three important demographic trends are affecting higher education today and will continue to play a pivotal role in shaping the future of postsecondary education. First, as the children of the Baby Boomers- the generation known as the Baby Boom Echo- enter college over the next fifteen years, the traditional college-age population will expand dramatically. Second, as the United States continues to become more racially diverse- with the increase in the number of people of color far outpacing that of whites in some parts of the country- so will the college population. Finally, the number of adults participating in postsecondary education also continues to increase. (p. 3)

Changes in overall population growth are quite dramatic and these changes will reflect new demands on higher education as the student populations more likely to increase will be less likely to be able to travel far for their postsecondary courses due to external demands for their resources. Many of the changes can be found in just a few states (Anderson, 2003). Indeed, eight states accounted for 54 percent of the population growth for the 2000 census (Arizona, North Carolina, Washington, Colorado, Texas, Florida, Georgia and California). These changes are likely to put enrollment pressure on the postsecondary systems of these states and to begin to shift the enrollment (particularly

of students who are geographically bound) away from states where populations are not increasing similarly. Certain racial/ ethnic groups are growing at a much faster pace than the general population. Hispanics, African Americans, Asian Americans, American Indians, and multiracial individual populations are all increasing at a faster rate than their White counterparts to create what Anderson (2003) terms the “emerging nonwhite majority“ (p. 9). The Hispanic population has grown the fastest due to immigration and birthrates. “[T]he rate of growth among Hispanics was so high that forty-four states saw their numbers increase by more than 40 percent....In North Carolina the Hispanic population increased by 400 percent [between 1990 and 2000]” (Anderson, 2003, pp. 6-7). African-Americans are experiencing population surges which are particularly of note in states where their populations were previously small (Anderson, 2003); overall this population increased by 16 percent between 1990 and 2000. The Asian-American population grew 50 percent between 1990 and 2000 (Anderson, 2003). Like the African-American population growth, this occurred primarily in states where the population had been quite small. The American-Indian population, although quite small compared with other racial-ethnic groups, saw a percentage growth which has important implications for future enrollment in higher education. Anderson (2003) notes that 2000 was the first year the U.S. Census offered a response category which included multiracial identifiers. This denotes a remarkable shift in demographics and, according to the most recent information available, this “new population“ already constitutes two percent of the U.S. population (U.S. Department of the Census, n.d.-b). These multiracial persons are considered non White (Anderson, 2003), and therefore the changes in this population have helped to

change the balance of race in the United States from a White majority to an emerging nonWhite majority (Anderson, 2003). This change, along with the changes in state populations and the shifts in the above noted racial-ethnic groups, will continue to force change upon a societal institution designed for and developed to cater to a White majority of students⁶.

In the late 1980s Aslanian and Brickell (1988) found that “White adults dominate[d] the adult learning market, constituting about 90 percent of all students” (p. 22). This is likely no longer the case considering the sweeping demographic shifts which have occurred in the interim. These demographic shifts are just beginning to be realized in the population of college attendees.

Anderson (2003) ends his essay with some important policy considerations:

The persistence of local, state and national economies will depend on the ability of higher education to provide access to students whose age, background, socioeconomic status, and race-ethnicity are varied. These students have different educational goals, learning styles and attendance patterns. (p. 11)

Critical Variables

Adelman identified several important variables with regard to bachelor’s degree completion. In other studies, no matter what the category of theory, or combination of

⁶ The author stipulates the value and importance of the Historically Black Institutions, as well as institutions specifically designed to meet the needs of Native American students, but the enrollment limits of these institutions demands that most students attend institutions which marginalize the needs of non-white students.

theories, identifying the variables statistically associated with degree completion allows both researchers and practitioners to better understand student behaviors, especially those which lead to persistence. The purpose of this research is to identify those factors associated with persistence for our specific population of students (those who delay college entry). Adelman's framework has been selected to guide this research as the academic focus will serve to answer questions about the importance of academics for students who are less likely to consider college as an option directly from high school. The literature about non-traditional students highlights the importance of academic integration for these students as they experience little in the way of social integration.

The author will attempt to identify critical variables and then examine them in the order they are likely to occur in the usual sequence of college attendance (St. John, et al., 1996). Additionally, as the cohort of students who delay is more clearly recognized in the context of comparison with traditional students, the review of the literature will first focus on the general persistence literature for each critical variable and then focus more narrowly on the variables identified as specific to the focal study population. Much of the persistence literature is based on traditional students (Bean & Metzner, 1985). Peter and Cataldi (2005) define traditional students as "dependent students who enrolled in postsecondary education full time immediately after high school graduation" (p. 31).

The literature clearly demonstrates the importance of various attributes with regard to the persistence of the individual in the postsecondary environment. This is based at least in part on the past associations and experiences, financial resources, and

dispositions (intentions and commitments) (Pascarella & Terenzini, 2005) which are influenced by demographics. Research has demonstrated that attributes are important variables for explaining persistence and degree completion. "Analyses of the effects of entering student (freshman) characteristics show that more than two-thirds of the variation among institutions in their degree completion rates is attributable to differences in their entering classes rather than to differences in the effectiveness of their retention programs" (Astin & Oseguera, 2002, p. ix). Demographic information, such as race, gender, and family socioeconomic status is determined for most prospective college students at birth. Academic attributes are determined during high school and beyond.

Demographics

Where a student comes from can help to predetermine the outcomes for that student. Many persistence studies have focused on specific demographic attributes in order to determine if the groups being studied have a greater or lesser likelihood of persistence (Allen, 1992; Attinasi, 1989). The demographic characteristics that have been studied include gender, race/ ethnicity, socioeconomic status, and parents' education. Some of these demographics can represent barriers to postsecondary education that are cultural or economic in nature.

Adelman selected a number of demographic variables to consider, but many of them did not generate a *t* value for the intercept of 0.765 or greater⁷. The variables that he selected to keep in his model were: (a) race/ethnicity, (b) gender, (c) family income,

⁷ This is the threshold that Adelman set.

and (d) first generation. The last two are proxy measures of socioeconomic status (SES), but the composite variable that Adelman used to identify SES specifically did not meet the threshold for remaining in the model. Variables such as the number of siblings and whether the student's high school was located in an urban area were not kept and will not be considered in the present study. Additional variables considered in the literature as salient for delaying students will be considered.

First generation. First generation students are those whose parents have had no experience with higher education. A variable which is closely related to socioeconomic status is the educational attainment or experience levels of the parents of the current students. Parents who have had experience with postsecondary education are more likely to "provide additional cultural and social capital for students, increasing the intensity of the interaction with the institution and adjustment to college" (Bean, 2005, p. 228). This supports the getting ready behaviors identified by Attinasi (1989). The literature is quite clear that having a parent who had no experience with postsecondary education is a barrier to postsecondary access and persistence (McDonough, 1997; Spady, 1970; Tinto, 1975,1993). McDonough (1997) found that first generation students are particularly challenged with regard to information sources about college. Other researchers have also found this to be true (Choy, Horn, Nunez, & Xianglei, 2000; Corrigan, 2003). "First generation students face the disadvantages of less experience and fewer resources for information on the social and academic demands of higher education" (Corrigan, 2003, p. 28). Parental education levels have also been found to be correlated with students'

educational aspirations (Hossler, Schmit, & Vesper, 1999). The implications for first generation college students are obvious.

There is an undeniable connection between first generation college students and socioeconomic status. Parents with no postsecondary experience earn less in the aggregate than do parents who have earned degrees or credits toward a postsecondary degree (U.S. Department of the Census, n.d.-a). Cabrera and La Nasa (2000) report that 77 percent of lowest socioeconomic status eighth graders have parents with no college experience, whereas 99 percent of the highest-SES eighth graders' parents had some postsecondary experience.

Some studies identify either the education of the father (Kowalski, 1977; Rehberg & Westby, 1967) or the mother's education (Carter, 2001; Ishitani & Desjardins, 2002) specifically as having more import with regard to the persistence of the student. Although there do exist discrepancies as to which parent's education has the greater association with persistence to degree attainment, there is little doubt as to the salience of either parent having postsecondary experience: this study will follow the example set by Adelman (2006) and identify those students where no parent had any postsecondary experience as first generation students.

Socioeconomic status. Included in the tools that students bring to college are the resources of their family. These resources include money (liquid and investments); education (the parents', as well as a parental interest in the education of their children); technology; information and other means by which people move from one stratum of

society to another. Bourdieu (1977) would term the last of these resources cultural capital, and his theory purports that it is a combination of these resources that determine one's ultimate place in society. Socioeconomic status (SES) is a critical factor in the study of the college experience- research has determined that students from lower socioeconomic strata are less likely to be persistent at every level in education, most noticeably at the collegiate level (Choy & National Center for Education Statistics, 2000).

Walpole (2003) uses Bourdieu's framework in her study of SES and college outcomes. She finds that students from low SES backgrounds experience college differently from their more fortunate peers.

From the data, it is apparent that the social status origins of a college student continue to affect his or her college experiences and outcomes. From a Bourdieuan perspective, these findings support the notion that students from low SES backgrounds possess different cultural capitals and habits than do all students or high SES students, and that attending college does not necessarily indicate that a student has risen economically or socially to a level similar to that of his or her peers. (Walpole, 2003, p. 63)

Walpole (2003) reports that low SES students are more likely to spend their time working outside of class, and spend less time studying than do college students in general (more than half report studying less than ten hours per week). This investment in economic capital at the seeming expense of academic capital is an important reflection of the differences in how low SES students invest their resources with regard to higher

education: The result is a lower GPA and smaller likelihood of graduating or attending graduate school. “Despite graduating from high school and enrolling in a four-year college or university, low SES students engage in a different pattern of activities in college and have lower early outcomes” (Walpole, 2003, p. 58).

Student reported income levels and other information are often the only way that researchers can collect data on a sensitive subject⁸. Some students may not even know about their parents’ income. In fact, Chen and DesJardins (2008) report that by coding the missing responses for income as a separate response category, they learned that those students who did not report the family income had the highest dropout risk. Hu and St. John (2001) found however, that low-income students were less likely to persist than those who did not report family income.

The connection between SES and parents is apparent from Walpole’s study. “Parental expectations and definitions of persistence vary with social status and mediate student outcomes” (Walpole, 2003, p. 48). Sewell and Shaw (1968b) also found that SES and persistence were connected through an intervening variable that they call parental encouragement. Parental encouragement was found to have the greatest effect on those who score the highest on intelligence tests and those who come from high SES backgrounds (Sewell & Shah, 1968b). Sewell and Shah (1968b) did determine that socioeconomic status had effects exclusive of parental encouragement and ability, “even after partialing out the effects of intelligence and parental encouragement, the

⁸ Please refer to the section labeled Limitations for more information on student reported data.

relationship of socioeconomic status to college plans continues to be substantial and statistically significant” (p. 565). Other researchers have also noted the importance of parental encouragement, but have not always connected this variable as strongly to SES (e.g., McDonough, 1997; Tierney & Hagedorn, 2002).

Researchers have found that socioeconomically disadvantaged students are often far less ready academically for college (McPherson & Schapiro, 1999). The crux of socioeconomic status and bachelor’s degree completion is based in high school context (Alexander & Eckland, 1977); the public school systems in the United States are closely linked to the local tax base and thus to the socioeconomic status of the people in a particular district. Schools in more affluent districts have better facilities and are able to pay better salaries for more competent teachers. Other researchers are more concerned about the school counseling function which often directs students from less affluent districts away from a 4-year college education either directly (Clark, 1960) or indirectly (McDonough, 1997). “Lowest-SES students were less prepared. While 42 percent of highest-SES students were highly academically prepared for college, merely 25 percent of lowest-SES students enjoyed the same level of preparation” (Cabrera, et al., 2005, p. 166). However, these researchers did not find that the lowest-SES students were substantially more in need of remediation when they got to college. “Our analysis is that the degree of association between SES and remediation is weak... Lowest-SES students were 9 percent and 4 percent more likely to take remedial English and math, respectively, than their highest-SES counterparts” (Cabrera, et al., 2005, p. 169).

Students from the lowest-SES backgrounds are statistically more likely to begin at a two-year institution (McPherson & Schapiro, 1999). This is proven to be a handicap where bachelor's degree attainment is concerned.

Paths pursued by students to earn a bachelor's degree do vary, in fact, by socioeconomic status. Lowest-SES students are most likely to journey on the path of medium academic resources and entrance at a two-year institution. The degree completion chances of those who journey on this path are only 3.3 percent. (Cabrera, et al., 2005, p. 161)

Sadly, but not surprisingly, students from low SES backgrounds are less likely to complete their degree (Carroll, 1989; Paulsen & St. John, 2002; Terenzini, Cabrera, & Bernal, 2001). Consistently, socioeconomic status (SES) is demonstrated to have a marked effect on college persistence (Choy & National Center for Education Statistics, 2000; Terenzini, et al., 2001). "The 4-year college participation rate for lowest-SES students lags behind that of highest-SES students by 37 percent" (Cabrera, et al., 2005, p. 176). In order to encourage access to higher education for all students, need-based financial aid programs were established by the federal and state governments (Adelman, 1999; Cabrera, Nora, & Castaneda, 1992; Gladieux & Swail, 2000).

It is difficult to disentangle the true effects of SES as it often is closely linked with other variables such as race, first generation college student, financial aid and academic preparation. Despite all of the legislation and social forces supporting equal opportunities in the US, the disparity between those who come from wealthy families and

those who do not is still striking in terms of attendance, and even more striking in terms of graduation rates.

Socioeconomic status interacts with a number of variables in a positive manner for affluent students: finances to get through postsecondary education, academic preparation, choice of first institution type, and fewer responsibilities during attendance such as work and family responsibilities. Students from the lower-SES strata often find that these variables interact in a negative manner with regard to their ability to attain a bachelor's degree. Adelman examined both family income and a composite variable which represented SES in quintiles. He also considers his variable for first generation college student to be a measure of SES. In his demographic sequence, the family income variable and the first generation college student variable met the threshold for inclusion in the model going forward, but not the composite variable for SES. Ultimately, the variable for family income was not included in the final sequences of the logistic regression. The present study will examine these two measures in as close an approximation to that used by Adelman as is possible given that the datasets are similar, but not the same.

Race. Many educational researchers are interested in a particular racial/ethnic group- African American students (Allen, 1992), Chicanos (Attinasi, 1989; Nora, 1987), or Native Americans (Belgarde & Lore, 2003)- those groups which have not traditionally enjoyed the same access and persistence in college as mainstream students. The student groups most likely to be disenfranchised are minorities excluding Asian Americans; these

groups have often been studied together in the same report (Nora, 2004; Tierney, 1999). Asian American students have demonstrated such persistence in postsecondary education (Astin & Oseguera, 2002) that they are often considered along with the White students when grouped for statistical analysis.

There is an unquestionable distinction between the cultural associations and value systems of different races, as well as generational nuances that occur as these cultures assimilate. These differences have an impact on the ability of students to persist in mainstream institutions (Escobedo, 2007). These cultural associations and value systems play a major role in the persistence of college students, as do more obvious physical differences. In some instances students who look different from the majority of students on campus and who have few role models on the faculty feel marginalized by the institution (Tierney, 1992). In a later article, Tierney (1999) identified the negative consequences of students feeling the need to abandon their ethnic identities to assimilate to the mainstream campus culture. Any instance where the student loses confidence for any reason can precipitate drop out.

Being African American or Hispanic may be correlated with higher levels of student attrition at certain institutions, but it is not the cause for leaving. A chilly or hostile racist atmosphere on campus would result in a clear sense of minority students not fitting in or feeling alienated, and this lack of fit or alienation leads to leaving. (Bean, 2005, p. 216)

In the same respect, a few researchers have studied minority student groups with regard to their perceptions of how they fit in on campus (Attinasi, 1989; Hurtado, 1994; Hurtado & Carter, 1994). It bears noting that Allen (1992) found that this often negative perception regarding fitting in can be mitigated by positive faculty relationships, confidence in their college and high educational aspirations, all of which lead to better academic performance.

Astin and Oseguera (2002), in explaining the dramatic differences of different racial/ethnic groups, found the common denominator to be "poor academic preparation, poverty, lack of education in the parental family" (p. 8). The overlap between first generation college students, SES, academic preparation, and race is extensive.

In an early study, Astin (1975) found that the African American students did not persist as well as the White students did. However, African American students attending 4-year institutions actually were shown to persist better than their peers when researchers controlled for academic achievement, aspiration and socioeconomic status (Astin, 1972; Peng & Fetters, 1978). The research of other scholars supports this finding (Walpole, 2003).

Heller (1997) found that African American students were more sensitive to price changes. Hu and St. John (2001) found that "the analysis of the aid packages reveals an increase in the efficacy of aid packages (size of the delta-p) for African Americans" (p. 273). Other researchers have noted that minority students favor grants over educational loans (St. John, 1991; St. John & Noell, 1989) to the extent that the type of financial aid

is more likely to lead to different educational choices; however, Hu and St. John (2001) noted that the delta-p's for all types of packages were positive for African American students indicating that all types of financial aid have positive effects on persistence. Hu and St. John (2001) also identified a trend of increasing importance of financial aid to Hispanic students.

Perhaps more importantly, Astin and Oseguera (2002) found that those groups which had increased enrollments (Asian American and Latino students) in the decade prior to their study were the same student ethnic groups that demonstrated the largest declines in 4-year graduation rates- Asian Americans and Mexican-Americans/ Chicanas/os (-11.4 and -9.2 percent, respectively). In terms of public policy implications, these are ethnic groups which are projected to have continued increases in college enrollment in the next decade or so- 30 and 39 percent, respectively (Hussar & Bailey, 2008, Table 22).

In the original *Tool Box* study, Adelman (1999) found that high school curriculum had an even bigger impact on African American and Hispanic students than it did for White students (raising bachelor's degree attainment rates from 43 to 75 percent for African American students and from 61 to 79 percent for Hispanic students).

Belgarde and Lore (2003) studied Native American students and persistence. They reported that "traditional cultural identity and heritage fosters a strong sense of personal self-identity and confidence among Indian students and in turn positively influences academic achievement" (p. 177). Student mentors support students of

minority backgrounds, and were found to have a positive impact in this study, as well as in others (Tierney, 1999) as an aid for these students to develop a cognitive map for negotiating the social and academic challenges which are perceived differently for these students than they are for students from the majority culture.

In Adelman's research, race is identified as a dichotomous variable where Asian and White students represent one response and the other represents minority students.

Gender. Female students in the U.S. higher education system have increased their enrollment and graduation rates, and closed virtually all gender gaps where males had achieved at higher levels in the past 30 years (Peter & Carroll, 2005a). Peter and Carroll (2005a) report that women are more likely than men to earn a bachelor's degree.

In their study on attrition, Pascarella and Terenzini (2005) found that male students view institutions from an "instrumental" orientation, as opposed to female students who have a more "intrinsic" orientation. In other words, female students look at an institution for what they can learn, while male students are more interested in the way the institution will define the student in the eyes of others.

Studies of persistence and gender recognize that women still have distinctive roles in society that can affect their enrollment in college. Bean and Metzner (1985) assume in their model that for non-traditional students, the indirect effect of gender on persistence will be a result of family responsibilities. There will be negative indirect effects for women associated with opportunity to transfer and which schools they can consider.

Women attend college as adults more often than do men. Aslanian and Brickell (1988) hypothesize about this and note that women are more likely to put their education on hold to tend to family responsibilities and that "the nation still has a large pool of capable, undereducated women, a leftover from earlier years when fewer women than men went to college after high school graduation" (p. 18). Gender, although not a risk factor, is tied to non-traditional students in an interesting way. Older students are more likely to be women, and these women are, in turn, more likely to have additional environmental factors in their lives which distract from simply being a student.

While women have increased their representation among younger, full-time students, who tend to be more persistent, women continue to represent 60 percent or more of students with characteristics that place them at a disadvantage in succeeding in postsecondary education. In particular, women make up 60 percent of students in the lowest 25 percent income level, 62 percent of the students age 40 or older, 62 percent of students with children or dependents (among married or separated students), and 69 percent of single parents. (Peter & Carroll, 2005a, p. v)

Delaying students. The Beginning Postsecondary Students Study (BPS) from NCES asked students their reason for delayed entry to college, and the responses include: paid work, military service, volunteer work, started a family, got married, cared for a dependent parent, dealt with a health issue for another person, traveled, pursued a hobby, and was incarcerated (National Center for Education Statistics, n.d., NDELAY). Students who either worked or joined the military prior to enrolling in their

postsecondary institution (22.5% of those who responded) are by far the largest percentage of delayed entry students that can be accounted for (National Center for Education Statistics, n.d.). This type of delay indicates financing issues and certainly makes relevant many of the barriers associated with non-traditional students. Adelman (2006) defines students who delay as those who delay their entry to college by more than 7 months.

Although 60 percent of men and 64 percent of women attended college immediately after high school in 1992 (Peter & Carroll, 2005a), there still remain 40 and 36 percent of the population who have completed high school, as well as those who did not complete high school in the traditional manner, who do not attend college directly; these potential students are increasingly likely to choose to attend college at a later time. This is a population of students that requires a specific focus because “delayed entry and other deviations from this traditional path result in lower persistence rates, and disadvantaged students are much more likely to follow a less traditional path” (Gladieux & Swail, 2000, p. 690). Those students who delay entry overlap with a group of students who are referred to as adult students (Corrigan, 2003) or older students (Hart, 2003) in the literature. “Once thought of and still termed *nontraditional*, these students are in the majority today. Older students have the full set of college expenses borne by traditional-age students, but they also often have family responsibilities” (Hart, 2003, p. 100). Many studies consider age as a demographic variable (Chen & DesJardins, 2008), and Horn and Carroll (1996) report that studies employ age as a “surrogate variable” as a means to capture a large population of non-traditional students. Paulsen and Boeke (2006) report

that many studies which are financial aid focused employ the surrogate variable of dependency status⁹ to examine non-traditional or adult students. In some instances these students are identified by their independent status (Corrigan, 2003). These students have life circumstances which require that they be more sensitive to the economics of going to college as they rarely have the financial support of their parents as do more traditional students, and quite often have the additional burden of not being eligible for financial aid as they cannot attend full-time (Longanecker & Blanco, 2003). Wlodkowski, Mauldin and Gahn (2001) found that 60 percent of adult students leave college before graduation. Using the BPS: 96-01 dataset, Chen (2007) found that students who were older than 24 had a significantly higher risk of dropping out. The present study considers non-traditional students in a manner more specific to the academic thrust of the study, through the variable that represents the delay between high school and college.

Bean and Metzner (1985) recognize the complications for the delaying student. "In the model, it is assumed that older students will have more family responsibilities, hours of employment, and higher levels of absenteeism than younger students. The indirect effects of age on dropout should be through these variables" (p. 494). Age is a variable that researchers have identified that is certainly related to the variable for delay. Age has been associated with higher grades in postsecondary education which could certainly support persistence to degree indirectly through the psychological variable of

⁹ "Students are considered independent, and their parents' income is not counted when determining their eligibility for aid, if they are graduate students, undergraduate students aged 24 or older, or younger undergraduates who are married, have children, are veterans, or are wards of the court. Eighty-four percent of independent undergraduates were aged 24 or older in 1999-2000" (Paulson & Boeke, 2006, p. 26; Wei, Nevill, & Berkner, 2005).

satisfaction (Metzner & Bean, 1987; Preston, 1976). In a more recent study, Sandler (2002) found that the persistence of older learners was associated with academic integration and goal commitments. Sandler recommended that institutions need to academically challenge and engage these adult students in new ways. Bean and Metzner (1985) also found that for non-traditional students, the utility of the degree and the education were very important, which ties into Sandler's concept of goal commitments. Students who delay are also distinct from their peers in terms of motivation. Two reports about adult students from the College Board recognize that adults turn to education at times when their lives change (Aslanian & Brickell, 1980, 1988). These associated life changes are often career or family triggers and are thus pragmatic. "The occupational motive outweighs all other motives combined" (Aslanian & Brickell, 1988, p. 1). The occupational motive drives educational choices from academic discipline, to financing the coursework, to attendance patterns; this is vital to understanding the needs and persistence factors of the older student.

Hu and St. John (2001) found adults to be less likely to persist during all 3 of the years in their study. Research results are mixed about adult and delaying students and their persistence; this is likely due to differing definitions both of persistence and of these populations, as well as the different populations used for these studies.

In the first *Toolbox* study, Adelman (1999), using students who were high school sophomores in 1980, found that 19 percent of his cohort delayed entry to college and only 46 percent attended 4-year institutions exclusively. In the follow up study, Adelman

found that “ramifications of delayed entry can be overcome, but only with the kind of considerable effort reflected in first-year credit accumulation and first-year grades” (Adelman, 2006, p. 54). This would require that the delaying student be a full time student, which is often not the case. Once Adelman’s model considered financial aid variables, the variable representing delaying college entry became statistically significant once again.

Hearn (1992) found that African American students were more likely to delay college entry than their White counterparts. Many low-income students are also delaying students. “Nearly 90 percent of low-income dependent students had delayed entry into college, compared with 24 percent of middle- and upper-income students” (Corrigan, 2003, p. 28). With regard to social capital theories of persistence, Hearn (1992) focuses his research on non-traditional students who he feels are marginalized by the institution of higher education, wherein his research is:

Directed toward an exploration of the extent to which those students pursuing less favored postsecondary enrollment options overlap those students whose social, cultural, and economic origins have already placed them at a disadvantage in the context of socioeconomic status in society. (p. 658)

Is this phenomenon simply a reflection of society’s prejudice toward these populations or is it higher education’s reluctance to change to accommodate the new populations of students, or both?

Students who delay represent a population which is growing and can be a positive addition to campuses in terms of diversity of thought and background, and can represent a sound investment in a new market for higher education (Aslanian & Brickell, 1988). As early as the 1970's Chickering (1974a) recognized the importance of the market of older students. "The number of adults pursuing some kind of further education also is increasing dramatically, soaring during the sixties from about nine million to twenty-five million" (p. 16). Although adult students are not always full-time students, with fees and unsubsidized tuition in combination with the generally reduced costs associated with serving adult students (full- or part-time), this is a population which can be served in a more cost effective manner. The demands of traditional students require weekday class space, whereas weekend and evening classes, always the preference for adult learners, take advantage of off-peak usage of the institution's resources. The economies of scale that can be reached by serving diverse groups of students and maximizing the use of the physical plant cannot be discounted.

Astin's (1984) theory of involvement in learning explicitly recognizes that the resource of student time is precious; "educators are competing with other forces in the student's life for a share of that finite time and energy" (p. 301). These other forces are also termed environmental factors. The external factors that influence the educational decision-making of students who delay are without question more complex than are the external factors which influence the decisions and subsequent behavior of traditional students. In studies of adults over 30 who returned to higher education, Smart and

Pascarella (1987) and Spanard (1990) found that the interaction of external and personal factors is increasingly complex.

Life becomes increasingly complex as we mature. Delaying students may move from dependent to independent status, change their marital status, and add children to their households. Adelman (1999) reports that according to the Data Analysis System for the Beginning Postsecondary Study these changes were not insignificant (18 percent, 19 percent and 9 percent respectively).¹⁰

Bradburn (2003) studied the reasons that cause students to leave college and determined that gender often plays a role. Men are more likely to leave for financial reasons (40 percent), whereas women are more likely to leave for a change in family status (12 percent) or due to family conflicts (14 percent) (National Center for Education Statistics, n.d.). These reasons have increased salience for the students who delay, as they are more likely to be more deeply involved with factors external to their education before they enroll in postsecondary education.

Peter and Carroll (2005a) report that women are overrepresented among the adult student population. Additionally, they note that women are overrepresented among adult students with families (Peter & Carroll, 2005a). Women are more likely to leave an institution due to family considerations (Bradburn, 2003).

Tinto (1993) and others (Braxton, et al., 2004) recognize the importance of external commitments, especially with regard to non-traditional students. Many non-traditional students come from families which have recently immigrated to the US, where

¹⁰ 14 percent of these students began postsecondary education with children.

the extended family is more likely to be interdependent than is the typical nuclear family from the US. Additionally, as the population in the US continues to age, the demographic of students with dependent parents is a trend that will continue to impact the persistence of students who delay college entry.

Researchers have found that commuter students who exhibit the characteristic of empathy are more likely to withdraw from college (Braxton, et al., 2004) which is attributed to the student's role in the family. For traditional undergraduates, living on campus has been consistently identified as having a positive association with student persistence (Astin, 1977; Chickering, 1974b). Astin (1984) reports that, "residents are more likely... to express satisfaction with their undergraduate experience" (p. 302). If a delaying student is less likely to live on campus due to having more family responsibilities, this can be a serious barrier to student persistence. Students who have family responsibilities are more likely to be commuter students who have more external pressures than traditional students, particularly with regard to their time and their finances (Kuh & Ardaiole, 1979).

Institutional choices and residence decisions are influenced by environmental factors. Cabrera, Burkum and LaNasa (2005) reported that low-income students were more likely to have children under the age of 12 and were more likely to be single parents. "Fifty-four percent of low-income adult students with children are single, compared with 21 percent of other adult student parents" (Cook & King, 2004, p. viii). Low-income independents who have dependents' make choices that are geographically and financially predisposed. Corrigan (2003) notes that "less than 10 percent of low-

income independents with dependents attend baccalaureate-granting institutions" (p. 29). Students who have children while attending postsecondary education are at greater risk for not completing their degree. It has already been established that students who are not continuously enrolled full-time are at a greater risk for attrition. Other researchers have found that family responsibilities exert an external force on the student that acts as a barrier to engagement as well as academic and social integration, which subsequently increases the risk of withdrawal (Nora, Cabrera, Hagedorn, & Pascarella, 1996). These family commitments have requisite responsibilities which can distract these students from concentrating solely on their studies. These students have financial pressures that are multiplied by the number of dependents and family responsibilities. "Nearly three out of four low-income independent students are supporting dependents. The personal and financial challenges for this group of students are particularly acute and merit... analysis" (Corrigan, 2003, p. 26).

High School Academics

Preparation for college study has been found to be a critical factor in persistence to degree completion (Adelman, 1999; Adelman, 2006; Astin, 2006; Hu & Kuh, 2002). High school academics refers to all of the academic and intellectual exercises and achievements that either prepare one for further study, or demonstrate that preparation.

What could be more important to the persistence of a student at an academic institution than his or her past success academically? Students who have been successful

are better prepared psychologically for the rigors of postsecondary education in general, and have a more solid foundation academically.

Standardized test scores. Academic success in high school is often defined by grade point average and class standing. The disparity in secondary institutions around the US creates problems of comparison regarding high school statistics; it is for this reason that standardized tests were created. The entity that we know of today as the College Board was established in the 1890s and the era of standardization was born (Hossler, 2004).

There has been much written about standardized tests and their ability to predict college persistence (Astin, 1971; Astin & Oseguera, 2005; Forelle, 2005; Nora, Barlow, & Crisp, 2005; Pascarella & Terenzini, 2005; "SAT and ACT exams are optional at more colleges," 1998; Sathy, Barbuti, & Mattern, 2006). Sathy, Barbuti and Mattern (2006) authored a report published by the College Board that unsurprisingly defends the importance of using the SAT to predict performance. This report focuses on the construction of the new SAT. Venti and Wise (1983) found SAT scores to be a good predictor of college completion when class rank is controlled for. Astin (2005), on the other hand, found that standardized tests were not a good predictor of college completion when environmental and institutional variables were also considered. "Once these factors are taken into account, scores on standardized admissions tests add little to our ability to estimate the student's degree completion chances" (p. 262).

Research has consistently shown that SAT scores have a strong predictive value relative to grades during the first year in college, but no research exists that points to any substantive validity of SAT scores in predicting overall student adjustment to college, academic engagement in the classroom, retention rates, or graduation rates. (Nora, et al., 2005, pp. 146-147)

Choy found a connection between standardized test scores and academic persistence in college, but as she explains it the scores seem to represent a more concrete connection to high school curriculum than a test of potential. "Students also took a longer time to finish when they entered less prepared for college work (as measured by their SAT/ACT scores) and when they struggled academically in college (as measured by their cumulative GPA)" (Choy, 2002, p. 27).

Not all institutions require that students submit scores for standardized tests. Students who are not good test-takers are more likely to apply to these institutions and may not report a score at all. The change in institutional policies regarding standardized tests therefore may have changed the pool of students who take the exams, the test norms and the responses to variables associated with test taking.

Adelman (1999, 2006) used a different test which was given to all of the students in his population in conjunction with the collection of the data for his studies. Peter and Cataldi (2005) describe this test:

In their senior year in high school, students completed a series of cognitive tests. The combined tests included 116 items to be completed in 85 minutes and

covered four subject areas, including reading comprehension; mathematics; science; and history, citizenship and geography. (p. 25)

This test is designed from older versions of the SAT, and only the reading and math scores are reported for the transcript studies (Rock, Hilton, Pollock, Ekstrom, & Goertz, 1985). Due to these factors, the correlation between this test and SAT and ACT tests is quite high and the reading and math test scores can be extracted from any of these tests to compare with another of the tests (Adelman, 1999).

Postsecondary anticipations/ aspirations. "Education aspirations are important because people cannot attain what they do not dream (or think possible)" (Carter, 2001, p. 6). Researchers have noted the importance of student aspirations as an indicator of their intent to earn a degree. These anticipations are likely to lose import as the continuation of education after high school becomes a norm of expectation. "92.6 percent (s.e. = 0.54) of NELS: 88/2000 students who graduated from high school with any kind of diploma... expected to continue their education in a postsecondary setting" (Adelman, 2006, p. 28). Venezia, Kirst and Antonio (2003) posit that expectations can become assumptions rather than anticipations. They believe that students assume that they will get into and complete postsecondary education. Gladieux and Swail report that "nearly all eighth-graders say they expect to go to college" (2000, p. 691).

Whether students aspire to college degrees, or anticipate them, or assume them while in high school, this planning ahead type of perception and/or actual behaviors allows students opportunities to begin to prepare for the rigors of academe (Cabrera & La

Nasa, 2001). Similar to Bean's student attrition model, based on an attitude-behavior model (Fishbein & Ajzen, 1975), students develop attitudes about attending higher education and those attitudes then lead to behaviors. Wanting, expecting or anticipating college begins the process of forming the attitudes that precede the behaviors associated with the persistence factors for college. "Aspiring for college degree is a good predictor of eventual college degree completion" (Astin, 1977; Cabrera, et al., 2005, p. 189). Cabrera and his associates (2005) also find that these aspirations help to mediate the difficulties of transferring from a 2-year institution to a 4-year institution, as students are planning to achieve a degree and are learning about, and laying the necessary groundwork. Kinnick and Kempner (1988) found that clear educational goals were important factors in bachelor's degree attainment for those students who began at 2-year institutions, as did Adelman (1999).

Tinto (1993) focuses on this variable in particular with regard to students who do not follow the traditional path, although he does so out of concern for properly accounting for persistent students.¹¹ "Of all the variables that influence who enters and who succeeds in college, aspirations and academic preparation are the most powerful" (Gladieux & Swail, 2000, p. 691).

In an early study of student performance, Astin (1971) hypothesized that differences in motivation must account for differences in achievement for students who are otherwise similar. It stands to reason that students with greater aspirations would

¹¹ Tinto argues that too many students are counted as being not persistent despite the fact that they were not planning to get a degree anyway.

have a greater motivation to persist. In a study of socioeconomic status, Sewell and Shah (1968b) actually used educational aspirations as their independent variable, so convinced were they that this demonstrated a realistic precursor to an outcome. They noted that these aspirations “reflect realistic rather than vague hopes [, which] is supported by the fact that 87.3 percent of the boys and 86.7 percent of the girls who stated that they planned on college actually attended college” (pp. 562-563).

Students’ educational goals have been found to have a positive association with persistence at all types of institutions (Astin, 1975; Munro, 1981; Pascarella, et al., 1983; Pascarella & Terenzini, 1980a; Peng & Fetters, 1978; St. John & Starkey, 1995). Ishitani and DesJardins (2002) also found educational aspirations to have a strong effect on persistence. Aspiring to a bachelor’s degree from as early as the eighth grade allows students to gather important high school credentials to prepare to apply to and to attend college. Pelavin and Kane (1990) determined that college aspirations in combination with high school course taking were significantly associated with both enrollment and completion. They also noted a disconcerting but unsurprising pattern with regard to socioeconomic status and aspirations. “Only 29 percent of students in the lowest income group aspired to a bachelor’s degree in comparison with 53 percent of those in the highest group” (Pelavin & Kane, 1990, p. 76). However, Beattie (2002) found that the variable representing expectations was not as good a predictor of outcomes as were student attributes.

Adelman's (2006) construct is similar, but distinct; " 'anticipations' is built from sets of questions asked in both the 10th grade and the 12th grade, and describes the *consistency* and *level* of the student's abstract expectations and concrete plans" (p. 28). Adelman expands on the work of Kao and Tienda (1998), identifying the construct of anticipations as being abstract, but becoming more concrete as high school graduation draws closer. It becomes a "rational judgment based on both school experience and input from parents and peers" (p. 29). Adelman's construct of anticipations stays in his model with a *t* value of 0.78, but just barely.

Bean and Metzner (1985) noted that the educational aspirations of non-traditional students had not previously been studied. "No research was found that adequately examined the relationship between pre-enrollment educational goals and the persistence of part-time, older students" (p. 496). Despite the fact that the non-traditional student has been studied more since 1985 (Choy, Horn, Nunez, & Chen, 2000; Corrigan, 2003; Hart, 2003; King, 2003), we still know little about their aspirations. They are, however, motivated in distinct ways from their peers (e.g., more practical, more career and goal oriented) (Aslanian & Brickell, 1988). Regardless of the utility of a bachelor's degree, Paulsen and Boeke (2006) report some disconnect between the idea and the reality of a bachelor's degree where adult students are concerned.

While 55 percent of those who had delayed entry by five to nine years expected to earn a bachelor's degree or higher; only 18 percent enrolled at their first

institution with the intention of either earning a bachelor's degree or transferring to a four-year institution." (p. 17)

High school GPA. Tinto (1975) and Pantages and Creedon (1978) posited that high school performance with regard to grades is a stronger predictor of persistence in college than the results of standardized test scores.

The data clearly show that high school grades are indeed a major determinant of the student's chances of completing college, regardless of whether degree completion is set at four, 6, or more than 6 years. Thus, if we look at degree completion within 6 or 6-plus years, we find that students who enter college with "A" grade averages are three to four times more likely to finish college than are students with "C" grade averages or less. (Astin & Oseguera, 2002, p. 13)

However, according to the research of Cabrera and Nora and their associates (Cabrera & Nora, 1993; Cabrera, Nora, & Castaneda, 1993; Nora, et al., 2005; Nora & Cabrera, 1996) , it would seem that high school GPA has only an indirect influence on persistence through college academic variables.

High school grades have been found to positively influence subsequent college academic performance, as measured by cumulative grade point average (GPA). However, academic performance in high school was also found to have very little influence on student persistence. (Nora, et al., 2005, p. 134)

There is an ongoing debate about the ability of either standardized test scores or GPA to predict persistence in college; a combination of these two factors has been identified by Astin and Oseguera (2002) as being more potent with regard to bachelor's degree attainment than either is alone.

While the multiple correlation involving these two variables is only .339 (accounting for a little more than eleven percent of the variance in retention), these two hypothetical students have very different chances of completing a degree within 4 years. Thus, the student with high grades and test scores is nearly seven times more likely to complete college (63 percent) than is the student with low test scores and grades (9 percent). (Astin & Oseguera, 2002, p. 23)

Academic momentum- *Toolbox Studies*. Adelman (1999, 2006) was inspired by the missing link in the ongoing admissions debate about the importance of test scores versus high school grade point average. Clearly missing from the debate was the issue of high school curriculum. Adelman (1999) argues that those indicators of pre-college achievement, test scores and grades/class rank, have nothing to do with making connections and collaborations between K-12 and higher education. This is the practical application of the toolbox metaphor: what *can* be changed in order to enhance student persistence? "Curriculum has everything to do with [these connections and collaborations]" (Adelman, 1999, p. 3). The variety of curricular path options in

combination with grade inflation and a lack of standardization at the K-12 level make Adelman's inclusion of academic resources in the debate quite reasonable¹².

Adelman credits Karl Alexander and his research fellows (Alexander & Eckland, 1974,1977; Alexander & Pallas, 1984; Alexander, et al., 1982; Pallas & Alexander, 1983; Thomas, et al., 1979) with the conceptual foundation of "academic resources". This research focuses on the importance of academic preparation with regard to college persistence and graduation (Alexander, et al., 1982). Further, Conley (2005) referred to different curricular possibilities as "curricular paths," and noted that there are important choices made in high school that will have consequences in college.

Mathematics course taking was highlighted in the *Toolbox Studies* (Adelman, 1999; Adelman, 2006). In a study of five year graduation, Kanarek (1989) also found certain mathematics variables to have import: these included a score on the mathematics portion of the New Jersey Basic Skills Test (algebra), a self-reported most recent high school math grade, and a self-reported ability rating in mathematics. In a pair of reports using the NLS-72, Pelavin and Kane (1988,1990) found that high school curriculum, especially mathematics, was critical with regard to college access. In fact, in the earlier study, they determined that the race gap in admissions was virtually negated by having taken advanced mathematics courses in high school (Pelavin & Kane, 1988). The follow-up study added college completion and found that geometry and foreign language study were also important pivot points in the high school curriculum for closing the completion

¹² Adelman's academic resources construct is a composite variable that includes a measure of high school rigor to account for variations between school districts and curricula.

gap for minority students, as well as for students from lower income groups (Pelavin & Kane, 1990). They found that “enrollment in the mathematics course sequence is strongly associated with attending college: 83 percent of all students who took geometry matriculated” (Pelavin & Kane, 1990, p. 75). In a study of high school science course taking and science test proficiency, Madigan (1997) identified the importance of the level of courses as opposed to the number of courses. While this might seem obvious, it serves to support the concept of the distinct hierarchy of mathematics and science courses in the secondary school environment.

In a global economy and an age of technology, quantitative skills have never been more important.

The world has gone quantitative. You cannot perform the majority of jobs without one of three types of mathematics proficiencies, all of which have their roots in algebra: (a) statistics, (b) finite/discrete math (the source of computer programming), or (c) calculus. The Tool Box studies have shown that math is a principal academic engine. (Akst, 2007, p. 16)

Choy (2002) found that a challenging mathematics curriculum in high school functioned to overcome a lack of parental experience in higher education for first generation college attendees.

Taking challenging mathematics courses can mitigate the effect of parents' education on college enrollment. The association between taking a rigorous high school math curriculum and going to college is strong for all students, but

especially so for those whose parents did not go beyond high school. (Choy, 2002, p.5)

Choy (2002) also found that mathematics course taking most likely to lead to college completion began as early as eighth grade. This demonstrates the connection of academics and aspirations in an interesting way.

The academic attributes that Adelman (Adelman, 2006) studied include Class rank/ GPA, senior test scores, AP courses, foreign language courses, highest level of math taken, curriculum intensity and a composite variable he developed to represent the construct of academic momentum.

High school academic intensity is a construct created by Adelman and used by other researchers from the U.S. Department of Education's National Center for Education Statistics. This academic intensity construct is reported on in Peter and Carroll's (2005a) study of gender trends in postsecondary education. These researchers found that the students who scored in the lowest 20 percent on the academic intensity indicator were the least likely to persist in their postsecondary studies (Peter & Carroll, 2005a). This may turn out to have implications with regard to the targeted population of students who delay entry, as we know that those students who score in the highest 20 percent are statistically more likely to attend postsecondary education directly and not delay (Peter & Carroll, 2005a). Peter and Carroll (2005a) also found that female high school seniors who scored in the lowest 20 percent of academic intensity over the 10 years between 1982 and 1992 increased in the percentage of bachelor's degree attainment from 7 percent to 13 percent,

which may also have important implications for our cohort of students who delay. Peter and Carroll (2005a) report that the students in the highest 20 percent of academic intensity and attending college are increasingly likely to be women.

In an early study of the BPS 96 dataset, using the information for the first 3 years of college, Horn and Kojaku (2001) found that high school curriculum was not only related to persistence through the third year of postsecondary attendance, but that it was also linked to socioeconomic status and family background factors such as family income level and parents' level of education. They found a distinct advantage towards persistence for those students who had taken a rigorous course load in high school, as well as an advantage for those who completed what they termed a "mid-level" curriculum.

There is little information available in the literature with regard to the academic preparation of the students who delay college entry (Bean & Metzner, 1985; Paulson & Boeke, 2006), and this is one area where the present study intends to close a gap in the literature. Staman (1979) found high school GPA to be salient for older students (defined as ages 22-45), but did not report a similar connection for traditional aged students.

Gladieux and Swail (2000) note that non-traditional students are more likely to have come from families with less economic capital and are more likely to be members of a minority group. This implies greater barriers academically; "low-income and minority high school graduates are not as well prepared in general, and a significant percentage of those who do enroll in 4-year institutions may lack the academic tools

required to succeed” (Gladieux & Swail, 2000, p. 692). They recommend increasing expectations with regard to policy requirements for content and achievement standards at the secondary level (Gladieux & Swail, 2000). These students are, in turn, likely to have attended a high school in a district with fewer resources that offered fewer opportunities to study the higher levels of mathematics. “This is a very critical equity issue because not all high schools can offer their students the opportunity to learn the higher levels of mathematics that propel people toward degrees- no matter what their eventual major field of study” (Adelman, 1999, p. 16). Aspirations have been demonstrated to have great import with regard to persistence, yet “the course-taking of low-income and minority students make it difficult for them to meet their expectations” (Gladieux & Swail, 2000, p. 691). The issue at hand is not college access, but the tools to complete a degree, and mathematics in high school has been demonstrated to lay a foundation for persistence. “The precise point at which opportunity to learn makes the greatest difference in long-term degree completion occurs at the first step *beyond* Algebra 2” (Adelman, 1999, p. 16). For students who attend high schools that don’t offer too many rungs on the math ladder, there is limited opportunity to learn, which ultimately translates into limited opportunity to persist in college.

In general, measures of high school academic performance currently seem to be among the strongest pre-enrollment predictors of persistence for students at both residence-oriented and commuter institutions, although extremely limited research has been conducted with older college students. In the model, the indirect effect

of high school performance on attrition is expected to occur primarily through its influence on GPA. (Bean & Metzner, 1985, p. 497)

Some students who delay college entry do so because they failed to even complete high school in the traditional manner. In a synthesis of GED recipients, Tyler (2001) reports that while 30 to 35 percent of GED holders attend some postsecondary education, few obtain any credentials associated with postsecondary education.¹³

In conclusion, we note that rigor in high school courses is a good predictor of persistence to degree completion in college for all students. We also know that high school academics, as represented by the constructs of aspirations and academic intensity, can moderate the effects of many barriers to postsecondary education. Making certain that students from all backgrounds have access to rigorous course taking and are aware of the benefits of a college degree will certainly help all students to persist in college. In particular, those students who delay and have attributes that indicate barriers such as being first generation college students, coming from a lower socioeconomic background, becoming parents at an early age, or being a member of a minority must be made aware of college as a possibility and what will help them to be persistent. There are several federal programs designed to create this awareness, but their mandate is to increase access; the scope of this mandate needs to be broadened to include degree attainment.

¹³ Fewer than .005% of female GED holders obtain an associate degree (Tyler, 2001).

Institutional Factors

Each institution is unique in many ways. For some students these unique features aid in their quest for a bachelor's degree, and for others the same institutional factors that make the institution unique may represent barriers to the bachelor's degree quest.

Despite regionalized accrediting agencies, credit currency (McCormick, 2003) and the general core of humanities and liberal education, individual institutions in the United States' system of higher education are quite distinct from one another. These individual differences have come about in many ways, both deliberate and accidental; such as mission drift. The result is that institutions have the ability to manipulate their policies, priorities and, indeed, even their missions in order to achieve various goals (enrollment, prestige, persistence).

With regard to institutional policies and practices focused on the persistence of students, it is incumbent on the institution to clarify its goals and then to communicate those goals to all involved either through reward systems, accountability and outcome enforcement, or some other means (Hart, 2003). As a rule, higher education is defined by a series of discipline silos and there is little accountability and often less teamwork: Committees in higher education are convened regularly, but not generally known for accomplishing the tasks they are given. The concept of an institutional goal of persistence being operationalized in both the curriculum and in course pedagogy is new and often requires intense support from the upper administration in terms of training and

rewards (Barr & Tagg, 1995; Evenbeck & Hamilton, 2006; Gansemer-Topf & Schuh, 2003).

Many scholars have offered suggestions for improving the individual institution as a means toward increasing retention. "The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement" (Astin, 1984, p. 298). In a meta-analysis of tests of social integration for traditional age students, Braxton and Hirschy (2005) found that there were several factors that an institution could focus on in order to improve retention (e.g., fostering active learning techniques and research to focus on the academic needs of disparate populations, as well as fostering institutional commitment via policies that enhance the perceptions of academic integration and a caring community). In a related study, Braxton and Mundy (2001) identified other factors that could positively influence retention and they referred to these as "institutional levers." Each institution has its own unique context. Successful policies and practices on one campus are not necessarily the answer for all institutions (Braxton, et al., 2004). In fact, Pascarella and Terenzini (2005) suggest that several small levers might have more impact and offer more persistence than one large effort.

The need to study the undergraduate experience and be able to identify and assess empirically tested performance measures associated with learning has been noted in national reports (National Center for Public Policy and Higher Education, 2000,2002,2008; Wingspread Group on Higher Education, 1993). Barr and Tagg (1995) noted that improving the quality of undergraduate education would require a paradigm shift for higher education, which would lead to learning centered classrooms and student

centered institutions. In order to truly create learning centered classrooms, an understanding of how students learn and what the barriers for some student groups might be is required (Stage, Muller, Kinzie, & Simmons, 1998; Umbach & Wawrzynski, 2005). Stage and her colleagues (1998) also note the importance of developing pedagogical techniques to promote learning. A study by Umbach and Wawrzynski (2005) focused on the need for empirically defining faculty behaviors and attitudes that affected learning. Chickering and Gamson (1987) identified "Seven Principles for Good Practice in Undergraduate Education" in their research, and several of these are pertinent to pedagogy and can be manipulated by an institution- faculty contact, cooperation among students, active learning, prompt feedback, high expectations, and respect for diverse talents and ways of learning. Kuh (1994) noted that each of these was important with respect to his construct of engagement.

Our findings suggest that students report higher levels of engagement and learning at institutions where faculty members use active and collaborative learning techniques, engage students in experiences, emphasize higher-order cognitive activities in the classroom, interact with students, challenge students academically, and value enriching educational experiences. (Umbach & Wawrzynski, 2005, p. 153)

In conclusion, there are many ways in which the policies and practices in higher education can enhance student persistence. While the faculty as the facilitators of learning are often at the center of these practices, the policies of the institution-

specifically where to allocate funds and how to support these efforts via a reward system—largely determine which endeavors an individual institution will support to help their students to persistence. Scholars have theorized that there is a connection between “better” teaching and faculty interaction and positive student outcomes (Kuh, 2001a; Pascarella, 2001), but the identification of what better means, specifically, can depend on institutional context. What is important is that retention of all students is an institutional priority that is supported, and that the barriers are understood for groups other than the traditional students.

Selectivity. One institutional variable is selectivity. In general, private institutions are more selective than are the public institutions in the United States. Graduation rates are higher at selective colleges and universities (Astin & Oseguera, 2002). Students who are “selected” for these institutions tend to be more focused, more motivated, better prepared, and to have had more academic momentum in their high school academic careers. In general, these students should be expected to succeed in college and the research bears this out. “Institutions that practice more selective admissions tend to have higher freshman-to-sophomore persistence rates than do colleges that practice less selective admissions” (Mortenson, 2005, p. 39).

Other researchers have examined selectivity as a variable representing the institutional context for students (Kuh & Hu, 2001). They found that “the more selective

the institution, the higher the levels of educational effort and satisfaction; however, selectivity was not directly related to gains¹⁴ (Kuh & Hu, 2001, p. 321).

Institutional control. In the United States there are publicly supported institutions and those which are private. Private institutions are generally more expensive, have smaller class enrollments, and are more prestigious and selective. Many of these factors have implications for persistence. Students who attend private institutions are statistically more likely to persist and to complete their degree (Pascarella & Terenzini, 2005). This phenomenon seems to have escalated in recent years. Astin and Oseguera (2002) found that, "the public-private gap in retention rates has also increased substantially during the past decade" (p. 29), meaning that students were increasingly less likely to graduate from institutions that are publicly controlled. Researchers have also determined that liberal arts colleges are more successful at identifying and supporting effective practices in undergraduate education which lead to student-centered campuses (Kuh, 2003; Pascarella, Wolniak, Cruce, & Blaich, 2004; Umbach & Wawrzynski, 2005). Liberal arts colleges are more likely to be private, but perhaps more importantly, they are more expensive than other institutions and encourage on campus residence in many ways. Too often, these colleges are located inconveniently for non-traditional students and priced out of their reach.

¹⁴ Kuh and Hu (2001) define gains as student self-reported gains in learning and personal development as specified in the CSEQ. They found similar associations with regard to satisfaction and self-reported levels of student effort.

The College Experience

The years we attend college are a time of great change in most people's lives. For researchers, it is sometimes difficult to determine which changes (or outcomes) can be attributed to the college experience versus other intervening life variables. During college students have many experiences which are both academic and social, and they also have experiences that are external to the interactions at the college.

The factors that affect persistence are often identified as having a positive effect on an intervening variable. Those intervening variables that are psychological in nature are identified in the literature as satisfaction and self-efficacy. These two intervening variables are positively affected by student efforts rewarded by academic and social achievements.

Involvement and engagement both represent the energy and enthusiasm with which a student attacks the challenges of college and earns persistence. Kuh and his associates (Hu & Kuh, 2002; Kuh, 2002,2003) have studied student engagement extensively and have found that engagement is very important to college persistence for all students. Although engagement has been found to be instrumental to the persistence of traditional students, the Liberal Education and America's Promise- LEAP program seeks to identify best practices in higher education so that institutions can better engage and serve all their students. Kuh (2008b) writes, "the LEAP initiative is especially concerned with students who, historically, have been underserved in higher education" (p. v). The application of these practices to increasingly distinct underserved

populations, or the identification of new practices which are more clearly aligned with the needs of underserved populations is the next logical step in Kuh's work.

The student who delays is more likely to be a part time student and not live on campus; this has important implications for social integration as the students are likely to have less contact with faculty and peers (Pascarella & Terenzini, 1980b). In Rootman's (1972) terms, the institutions of higher education will not be a "total adult socializing institution" for these students. The influence of external factors, including the non-traditional student's pre-college communities, is more pervasive and their "net climate" (Rossi, 1966) is focused externally rather than internally toward the college social experience. One of the variables considered by Bean and Metzner (1985) is enrollment status: They define full time enrollment as 12 credits or more, and in their literature review cite other researchers as having found this to be relevant with regard to persistence (Alfred, 1973; Tweddale, 1978). The majority of older students attend college part time (Bean & Metzner, 1985; Greer, 1980), and this has been identified as a risk factor with regard to bachelor's degree completion.

For the delaying student, who by virtue of circumstance cannot be socially integrated on campus, academic integration and the utility of the degree are what keep the student returning semester after semester (Bean & Metzner, 1985). Academic integration can be fostered through the use of pedagogical techniques such as learning communities and active learning. The traditional learning community is by no means the only alternative; Lenning and Ebbers (1999) identify four types of learning communities in

their report for the Association for the Study of Higher Education (ASHE). To a population that is more academically than socially engaged on campus, it stands to reason that the faculty is intimately connected to many variables associated with persistence. The interest of these students in practical matters related to their careers is a mutual point of interest for the faculty and these students. In addition, the methods used to teach varied populations must address the associated learning styles of the students in the class.

Any pedagogy that will enhance student outcomes will also enhance student satisfaction with learning and with the institution, and will act on satisfaction and self-efficacy.

Freshman year academics. The importance that the literature has attributed to the transition from high school to college is unquestionable. Freshman year is full of changes for which many students are unprepared or lack maturity. (Gerdes & Mallinckrodt, 1994; Harrison, 2006) In Tinto's terms, this is when the separation from the community of family and childhood occurs (Elkins, Braxton, & James, 2000), especially for the traditional student. The research has identified a number of actions an institution can take to improve the outcome of graduation for students overall (Glynn & Miller, 2002). Specifically, the literature recognizes the importance of orientation program content in easing this transition (Davig & Spain, 2003; Goodman & Pascarella, 2006). In an earlier study, Pascarella and Terenzini (1978) noted the importance of a focus on the interaction of freshmen and the faculty. Nora, Barlow and Crisp (2005) found an interesting series of relationships between high school grades and academic

performance in college- specifically first year performance and ultimate persistence for marginalized populations, in particular. "Even though minority students may not be required to withdraw from college because of their GPA, earning low grades introduces a sense of doubt related to academic performance and belonging in college for students of color" (Nora, et al., 2005, p. 134). Researchers have noted the connection of first year performance (academic) to bachelor's degree completion (Pascarella & Terenzini, 2005). Self-esteem and maturity (self-efficacy) are important preconditions to satisfaction, which has been demonstrated to lead to persistence. Ishitani and DesJardins (2002) found that students whose first year GPA was less than 2.0 were unlikely to persist beyond year two. A student who is not academically successful in his or her freshman year will likely not be allowed to continue with their education. Astin and Astin (1992) found that science and math performance in freshman year was a predictor of degree attainment. How well the student acclimates to college, how well prepared the student was to come to college and the effort a student puts toward college work are all reflected in the first year momentum (Pascarella & Terenzini, 2005). Students leave college for many reasons. Academic dismissal is one reason; a lack of confidence can also create problems that can spiral into attrition. Academic dismissal is the ultimate result of poor grades. Hurtado and Carter (1994) report that Latino students struggle with fitting in to a community at college that is vastly different than what they are used to. They further report that this lack of confidence about fitting in can be overcome by positive interactions with the new community. The grades that a student earns can validate their membership in the community, or validate their lack of confidence and lead to attrition.

Adelman (1999) found that two variables were major contributors to degree completion- first year GPA and the number of credits earned in the first year. In the follow-up study, Adelman (2006) found the following to be true with regard to first year academic performance: students who did not complete a minimum of 20 credits in the first year lessened their probability of completing their degree by one third; and students in the top two quintiles of GPA for the first year increase the probability of their completing a degree by 22 percent.

Freshman year is a different experience for non-traditional students. The transition in question is not from high school to college, but rather a return to school. This can be equally as difficult, but most freshman transition programs were designed to react to the challenges of the traditional student, and perhaps components were later added to attempt to meet the unique needs of disparate populations of students.

Non-traditional students are more likely to first attend a 2-year institution; if so, their bachelor's degree attainment rate after 6 years is only 13 percent (Berkner, et al., 2002). These students face the barriers previously discussed, yet some manage to persist. Despite a higher rate of remediation and more family obligations, low-income adult students earn slight[ly] better grades, on average, than do traditional students" (Cook & King, 2004, p. viii).

Social integration. Social integration is an important construct in Tinto's theory and this is often the basis for many of the studies on attrition of traditional students. Gerdes and Mallinckrodt (1994) noted that social and emotional adjustment to college

was more predictive of persistence than academic integration. For traditional students, social integration has been found to have import with regard to retention (Astin, 1993; Braxton & McClendon, 2001).

The importance of social integration for traditional students has been demonstrated in many studies. In one study of traditional students, for example, Braxton, Sullivan and Johnson (1997) found that social integration influences institutional commitment which has a positive effect on persistence. Those factors which combine to form the construct of social integration for traditional students include living on campus, participating in extracurricular activities, some forms of interaction with faculty, and attending cultural activities on campus. These factors are experienced by non-traditional students in a manner quite distinct from their traditional counterparts (Bean & Metzner, 1985).

Academic integration. Academic integration represents the academic focus of the students as they become engaged in the practices of learning and growing intellectually. The importance of high school preparation and academic ability for persistence in an institution whose primary purpose is the furtherance of academic accomplishment seems evident. High ability students can gain a great deal from attending college. Astin (1984) tells us that “students who participate in honors programs gain substantially in interpersonal self-esteem, and artistic interests” (p. 304).

DesJardins and his colleagues (2002) found academic factors to have import with regard to persistence. These factors comprised performance indicators including grade

point average (GPA) prior to enrollment, as well as their interpretation of Tinto's construct of academic integration. Chen and DesJardins (2008) noted this factor to be very salient with regard to retention; they found "a 1 standard deviation increase in academic integration is associated with a 13.3% decrease in the odds of dropout" (p. 12).

Gansemer-Topf and Schuh (2003) found that there were academic programs that explained approximately half of the variance in graduation rates. These programs require institutional support in the form of expenditures and prioritization, which leads to the conclusion that allocating funds for academic programs designed to support persistence can be a strategic means of increasing student persistence. Institutional levers can be manipulated to increase or decrease levels of academic integration for distinct populations of students. Braxton and McClendon (2001) noted that institutional practices could be manipulated to increase academic integration, specifically, they offer suggestions for "eight domains of practice: academic advising, administrative policies and practices, enrollment management, faculty development, faculty reward system, student orientation programs, residential life, and student affairs programming" (p. 58).

Amongst the academic strategies that institutions can use to effect retention, the most potent are connected to pedagogy and the faculty.

The internal communities of the institution are critical to integration and engagement, but the external communities that students belong to can either support or conflict with those internal communities to create dissonance which can lead to attrition (Hossler, et al., 1999; Tinto, 1993). This congruence or lack thereof is often a critical

factor with regard to non-traditional students who are less likely to leave behind their former communities in favor of the college community. This is particularly true of non-traditional students who choose not to reside on or near campus. Commuter institutions are more likely to be chosen by non-traditional students. Although the population of non-traditional students is not the same as the population of students who attend commuter institutions, there are some similarities with regard to social integration that should be considered for both populations. "In contrast to residential institutions, commuter colleges and universities lack well-defined and -structured social communities for students to establish membership" (Braxton, et al., 2004, p. 35), "...therefore the academic dimensions of the commuter institution play a consequential role in the student departure process" (Braxton, et al., 2004, p. 48).

As we study non-traditional students, we expect to find that they are less engaged socially on campus, are less likely to live on campus, and are more likely to have developed relationships outside of the college environment which demand their attention. Bean (2005) noted that the non-residential, part-time student was a challenge for two reasons: (a) their heterogeneity made it difficult to determine statistical relationships, and (b) external pressures sometimes force them to act in ways contrary to their intentions.

Metzner and Bean (1987) argue that because non-traditional students are not integrated socially, "theories other than socialization [should be] used to link the variables in the model [of nontraditional student persistence]" (p. 18). These authors use the lens of behavior-attitude theory as defined by others (Bentler & Speckart, 1979;

Fishbein & Ajzen, 1975), wherein past behaviors are linked to future behaviors by means of attitudes first, and then intentions. Metzner and Bean (1987) studied non-traditional students by studying part time students. "These results suggested that non-traditional students dropped out of college for academic reasons or because they were not committed to attending the institution, but their reasons for leaving were unrelated to social factors at school" (p. 15). Specifically, they noted several factors as being important in the study of non-traditional student attrition: GPA, hours enrolled, utility of education, satisfaction with the role of student, opportunity to transfer and age (Metzner & Bean, 1987).

Faculty impact. Amongst the tools that institutions have in their own toolboxes are those which are related to the faculty and to pedagogy. Astin (1984) noted that "finding ways to encourage greater student involvement with faculty (and vice versa) could be a highly productive activity on most college campuses" (p. 304). Faculty contact has been found to be associated with student satisfaction, a variable that serves as an intermediary variable to persistence in some studies. "Frequent interaction with faculty is more strongly related to satisfaction with college than any other type of involvement or, indeed, any other student or institutional characteristic" (Astin, 1984, p. 304). Faculty and student interactions have been studied by numerous educational researchers (Astin, 1977,1993; Bean & Kuh, 1984; Feldman & Newcomb, 1994; Kuh, Schuh, Whitt, & Associates, 1991; Lampton, 1993; Pascarella & Terenzini, 1976,1977,2005; Tinto, 1993; Wilson & Gaff, 1975), most of whom have found them to have positive results with regard to outcomes. In many ways, the faculty is the "face" of the university to the students. These interactions have been categorized into those that

are purely social and those that have to do with course content, faculty expertise and vocational advice. Interactions are generally presumed to be positive, aiding the student in the integration to the norms and values of the new community. These interactions can have direct effects, or they can work through intermediate variables of student satisfaction (Aitken, 1982; Bean & Bradley, 1986), student engagement (Kuh, et al., 1991), or social or academic integration (Tinto, 1993). The persistence theories rely on the student being satisfied enough with the experience to continue, or becoming integrated or engaged while on campus with others from the institution to the extent that continued enrollment is desired.

Many researchers have found that student-faculty interactions are strong positive predictors of persistence through the intervening variable of student engagement (Braxton, et al., 1997; Hurtado & Carter, 1997; Pascarella & Terenzini, 2005; Stage & Hossler, 2000). "If educational practices lead to student engagement and student engagement leads to certain outcomes of college (e.g., student learning and retention) it can be said that educational practices indirectly lead to student outcomes from higher education" (Umbach & Wawrzynski, 2005, p. 156).

In concert with Tinto's concepts of social and academic integration, the interaction of students and faculty in settings in and out of the classroom has been found to have an important association with persistence and student persistence (Braxton, Bray, & Berger, 2000; Braxton, Milem, & Sullivan, 2000).

Astin (1984) bemoans a lack of involvement on the part of the faculty. "In fact, recent attempts to expand educational opportunities for underprepared students have probably been hindered by the continued adherence of most faculty members to the subject matter theory of learning" (p. 299). In order for institutions to truly affect faculty behaviors, institutional priorities need to be consistently reflected in the reward structures. Institutional priorities change and faculty, perhaps due to the unconditional nature of tenure, feign interest, but rarely change their priorities in concert with the fads of institutional priorities.

Many institutional leaders are short-timers; just as priorities, strategic plans and tactics are established and initial steps are taken, key administrators move on.

The pattern is so predictable that wizened faculty and staff members have learned to sit on the sidelines, waiting for the announcement about the next set of priorities. (Kuh, 2008a, p. A72)

Pascarella and Terenzini (1979) found that there were specific gender differences with regard to what types of faculty interactions were most important to students. Not surprisingly, these differences were similar to those found in other studies where female students were more interested in encouragement to learn, whereas male students were more interested in practical career advice. A related study (Lundquist, Spalding, & Landrum, 2002) indicated that faculty attitudes towards students were more likely to cause a female student to leave an institution.

Engaging students in the classroom is also important. Braxton and his colleagues (Braxton, Bray, et al., 2000) stipulate that students should be directed to those professors that other students have perceived as having been prepared for class and as having superior instructional skills. These faculty variables have been found to positively influence social integration and thus influence persistence indirectly (Braxton, Bray, et al., 2000). These same factors have also been linked to student learning (Pascarella, Edison, Nora, Hagedorn, & Braxton, 1996). Higher order thinking practices and active learning also positively influence persistence via social integration (Braxton, Milem, et al., 2000). Both pedagogies are positively linked to learning outcomes (Chickering & Gamson, 1987). Cabrera, Colbeck and Terenzini (2001) also found that instructor behaviors can positively influence student outcomes. They specifically identified the importance of “instructor interaction and feedback, collaborative learning and clarity and organization” (Cabrera, et al., 2001, p. 350).

Researchers have also found that the least frequent type of faculty-student contact was working on a research project with faculty (Kuh & Hu, 2001). This is disturbing as intellectually focused interactions had been previously found to have the greatest impact on students (Pascarella, et al., 1978). Pascarella and Terenzini (2005) found that faculty student interactions that were more substantive in nature had the greatest impact, in particular, freshmen who were engaged with faculty in this manner were the least likely to leave the institution voluntarily (Bean & Kuh, 1984; Pascarella & Terenzini, 1977). In fact, they specifically identified research with faculty as having the greatest impact on outcomes, including degree attainment (Pascarella & Terenzini, 2005). The importance

of substantive interactions with faculty has given rise to the practice of living and learning communities where faculty and students interact outside of a classroom, but often in a more academic than social manner (Pascarella & Terenzini, 1980b).

Walpole (2003) found that faculty interaction was very salient for low SES students, especially with regard to graduate school attendance after bachelor's degree attainment. Low SES students are more likely to have worked on research with faculty which can be converted into social capital (recommendation letters) and cultural capital (knowledge of application processes and requirements for grad school).

As the delaying student transitions back to an educational environment, he or she will need the support of faculty and peers. Seidman (2005) also noted the lack of social integration for the delaying student and offered the development of classroom communities as a possible solution. Faculty members would be integral in such an effort. As early as the early 1970's scholars noted the necessity of "radically improved" training for faculty with regard to meeting the needs of an increasingly diverse student body (Bushnell & Zagaris, 1972). In order to improve the pedagogy, training needs to be improved, but so do the reward structures of the university. "Incentive structures need to change if more students- especially those from historically underserved backgrounds- are to survive and thrive in college" (Kuh, 2008a, p. A72). The "new students" in higher education have different pedagogical needs and interact with the faculty in distinct ways. These students also need the support of peers to be persistent; a creative, focused faculty

member can design the curricula in ways that encourage peer interaction which will lead to peer support in most instances.

Faculty members, more than any other group of employees at the university, shape the psychological processes and attitudes that have the greatest effect on retention. Faculty members' in-class and out-of-class contacts with students affect the students' sense of fitting in, loyalty, institutional quality, satisfaction, sense of self-development, self-confidence and self-efficacy, the connection between coursework and later employment and stress. (Bean, 2005, p. 223)

The self-efficacy connection to faculty contact can help a student to feel as though they are capable of belonging to the new community, and marginalized students in particular question their abilities and require positive reinforcement (Allen, 1992). Bean and Metzner (1985) found that satisfaction with the role of student was of key importance for the non-traditional student, and the ability to be confident is a result of satisfaction.

Students who delay have complicated concerns with the academics of their institution. Aslanian and Brickell (1988) found that "the teaching skills of professors are of greater importance to adult students than the positions they hold within the college" (p. 68). Adult students are concerned with various aspects of academics including teaching quality, but seem to be willing to forego the academic credentials of their institution in favor of convenience. Convenience is of utmost importance to adult learners, however, and they "may simply assume the academic quality of the institutions they decide to attend" (Aslanian & Brickell, 1988, p. 56).

When asked why they chose their colleges, the adults who were attending 4-year colleges [noted academic quality]. About 25 percent of adults attending 4-year colleges cited academic quality, compared to 10 percent of adults attending two-year colleges. (Aslanian & Brickell, 1988, p. 117)

The curriculum requirements of these students who delay are pragmatic. "Adult students want to connect their classroom learning with their careers. Practical applications of classroom material provided by professors is one way, and academic and career counseling are other ways" (Aslanian & Brickell, 1988, p. 90). The services most likely to be important to them are those that relate to career planning, work experience and perhaps even graduate school. The faculty can be important in all of these areas.

Most adults seek degrees that have immediate utility. They deposit their learning into a checking account- not into a savings account- so that they can draw on it without delay. To most adults learning is a liquid resource, not a long-term capital investment. (Aslanian & Brickell, 1988, p. 42)

Learning communities. One of the most promising tools for undergraduate retention is learning communities. No less an expert on student persistence and success than Vincent Tinto encourages institutions to employ learning communities (Tinto, 1997). A great teacher can create a sense of community around any course with the correct assignments and co-curricular connections. "Small communities develop around the college classroom, a community for each course. Such communities develop,

however, only if faculty members actively involve students in the process of learning” (Braxton, et al., 2004, p. 48).

Regardless of how we choose to define success in college- whether it is a statistical measure of success and retention, or gains in critical thinking and writing abilities, that show up as positive outcomes on student learning assessments- we now have compelling evidence to suggest that creating learning communities on campus leads to greater student success in college (Shapiro & Laufgraben, 1999, pp. 14-15).

There are formal learning communities which are comprised of living arrangements for a small number of students and often faculty and facilitators, too. These students usually share an academic interest, as opposed to the more social living arrangements elsewhere on and off campus. The students in the learning community have classes in common and often have facilitated formal discussions about course content outside of the classroom.

Braxton (2004) also advocates the use of active learning techniques. The days of the lecture from the podium are numbered. Too many students cannot connect to the content when it is delivered in this manner. Learning styles is just one barrier; today's student has been raised to be better able to multitask and use technology, but is less able to concentrate for long periods at a time (Carnevale & Fry, 2000). Those activities where the student can put the theory into practice are the ones that have the most resonance for this generation of students. “Such participation also fosters academic integration.

Moreover, students enrolled in courses offered by faculty who engage students in active learning experience greater degrees of academic integration and are also less likely to depart from college" (Braxton, et al., 2004, p. 49; Braxton, Milem, et al., 2000).

Satisfaction. Students who are satisfied with college experiences, or even with external experiences that reinforce the importance of college (e.g., job related college major), are more likely continue to attend, all else being equal. Braxton, Vesper and Hossler (1995) contend that persistence is connected to the expectations for college through the construct of satisfaction. The psychological theories of persistence rely on satisfaction as a precursor to positive behaviors. Engagement and involvement also engender satisfaction. This leads to confidence which reinforces positive persistence behaviors, especially in adult students.

In any relationship, when expectations are met the relationship flourishes. Student behavior and their individual relationships with institutions are great examples of this. Braxton, Vesper and Hossler (1995) connected pre-college expectations for a particular institution with a commitment to graduating from that same institution. Tinto (1975,1993) identified two types of commitment necessary for student retention in higher education, institutional commitment and educational goal commitment. Non-traditional students are less likely to be involved in social activities and are more interested in the utility of their degree than they are committed to attending a particular institution. Noting the declining importance of institutional commitment, especially for non-

traditional students, this research will focus on the importance of the student's commitment to the goal of a bachelor's degree.

“Nearly all eighth-graders say they expect to go to college... aspirations, however, must be acted upon” (Gladieux & Swail, 2000, p. 691).

The only student-faculty interaction Kuh and Hu (2001) found to be negatively related to satisfaction and vocational preparation was when the faculty worked with students on their writing. These same researchers also found that the faculty was more likely to interact with Latino students in exactly this way. Our study population is statistically likely to be underprepared and minority, so an understanding of satisfiers for the students who delay combined with sensitivity are important tools for the faculty toolbox.

We know that adult students have different motivations from their traditional counterparts. Aslanian and Brickell (1988) specify that these students have utilitarian motivations, they are interested in the benefits of their education with regard to earnings and job prospects. These researchers specifically note the importance that adult students ascribe to the teaching ability of instructors (Aslanian & Brickell, 1988).

Financial Aid

Many researchers have studied the impact of financial aid on persistence. In an era where college costs have exceeded the inflation rate, it is not surprising that the cost of higher education to an individual student plays a role in that student's decision to reenroll semester to semester. Financial aid was created to defray college costs through

grants, loans and work study. "Nearly 40 years ago, the first U.S. Higher Education Act institutionalized federal support for higher education as a national interest and pledged that no student would be denied the opportunity for postsecondary education due to financial constraints" (Chen & DesJardins, 2008, p. 1). Sadly, the thrust of financial aid has shifted from need based to merit based, and this threatens the ideal of education for all, most especially for the economically disadvantaged, who are statistically less likely to receive merit aid and are often not able to attend higher education without some assistance.

Cabrera, Nora and Castaneda (1992) found, not surprisingly, that finances play a role in persistence. This finding has been echoed by other researchers (Ishitani & Desjardins, 2002; Nora, et al., 2005; Nora, et al., 1996). In particular, Ishitani and Desjardins (2002) found that financial aid was the most important factor in reducing attrition in the third year of college. Nora, Barlow and Crisp (2006) report that "researchers [have also] concluded that merit-based financial aid indirectly increases graduation rates by enhancing the chance that the student will remain continuously enrolled" (p. 141). However, in a different study DesJardins, Ahlberg and McCall (2002) report that financial aid does not directly affect degree attainment.

The increase in cost in combination with the change from need-based to merit-based aid has shifted the burden of paying for higher education from the general public to the individual student and their family (Callan, 1997; Mumper, 1996). Researchers have demonstrated concern that the financing environment is fraught with barriers to student persistence, particularly for those students from minority and low-income backgrounds

(Baker & Velez, 1996; Orfield, 1992). Other researchers have considered the influence of financial aid on different racial groups of students (Hu & St. John, 2001; St. John, Paulsen, & Carter, 2005), or more specifically the influence of price response for different racial groups (Kaltenbaugh, St. John, & Starkey, 1999). Researchers have determined that minority students are less willing to use loans to finance their education and are more price sensitive (St. John, 1991; St. John & Noell, 1989). This has important implications for race with regard to access and persistence. Chen (2007) took this a step further to also consider income level. In related research, she and Stephen DesJardins examined financial aid and persistence considering income level (Chen & DesJardins, 2008) using event history modeling. Their hypothesis that low-income students are more sensitive to net tuition and financial aid changes (Chen & DesJardins, 2008) has also been identified as critical by other researchers. In a comprehensive review of the literature on student price response, Leslie and Brinkman (1987) identified low-income students as being more price-sensitive than their counterparts. Clearly, a price-sensitive student is less likely to choose to attend an institution that is not able to provide financial aid to reduce their need gap.

About 80 percent of private colleges assess applicants for admission without regard to their ability to pay, according to a new report from the National Association for College Admissions Counseling. But don't confuse "need blind" with "need met." Only 18 percent say they provide a package of loans and/or grants covering the full cost of attendance for students with demonstrated need. ("How sensitive are they?," 2009, p. 8)

Low income and minority students are unlikely to choose to attend an institution that does not close their need gap, as they are less likely than other students to take on loans to attend college. Also confounding is the movement from need-blind to need-sensitive admissions, which excludes these students from options even earlier in the process. "Quietly, however, the school has moved from a need-blind admissions approach to a less inclusive one that enrollment director Nancy Benedict calls 'need sensitive,' which probably means granting admission to fewer students who need large aid packages" (Kingsbury & Fitzpatrick, 2008, p. 39). In today's financial climate where state aid is being reduced at greater rates than ever before (Herbert, 2009), this is a way for institutions to stay solvent at the expense of access.

Adelman (1999) examines three dichotomous variables which represent financial aid: grants, loans and studentwork. In the *Original Toolbox*, Adelman found that grants and student work were modest contributors to the understanding of degree completion in the financial and attendance steps of the model, but were not kept in the full sequence as they did not meet the threshold for statistical significance.

For students who attend 4-year colleges at some time, the only form of financial aid that bears a positive relationship to degree completion after a student's first year of college attendance is employment (principally College Work-Study and campus-related) undertaken (a) while the student is enrolled, and (b) for purposes of covering the costs of education. (Adelman, 1999, pp. 64-65)

In the *Toolbox Revisited*, Adelman (2006) also found the student work variable was the best of the three financial aid variables with regard to degree completion;

however, the t-statistic of 0.66 did not merit the variable being carried forward to the next sequence in the narrative.

Researchers have found that the financial circumstances of students who delay are more complex and more tenuous. Wlodowski, Maudlin and Campbell (2002) found that financial aid is critical to the persistence of the adult student. "Adults tend to make choices that maximize their income and reduce their educational expenses" (Paulson & Boeke, 2006, p. 26). Indeed, Wei, Nevill, and Berkner (2005) found that 83 percent work (58 percent work full-time), 80 percent attended classes part time or for part of the academic year, and 56 percent attend community colleges. Paulson and Boeke (2006) report that independent students were less likely to apply for aid, but that when they did, they received higher amounts with regard to both grants and loans. This disinclination of independent students to apply for financial aid is based in part on the fact that little aid is available to students who do not attend full-time. Although Bean and Metzner (1985) note that the Basic Educational Opportunity Grants, the Pell Grants, and several state financial aid programs "indicated the continued political legitimacy of providing resources to many nontraditional students" (p. 487). Current researchers are also critical of the efforts of public policy in keeping up with the needs of the changing students, in particular those students who do not enjoy the benefits of full-time status. Longanecker and Blanco (2003) argue convincingly that current policies stipulating who receives financial aid are not only dangerously slow to react to the changing student demographics, but they create unnecessary barriers to the persistence of students who have needs which are distinct from those of traditional students. In particular,

Longanecker and Blanco take issue with required credit levels for eligibility, funding periods limited to semesters, and the fact that the policies are institution- rather than student-centered. "Our policies are designed to protect the providers of education rather than to respond to the needs of consumers" (Longanecker & Blanco, 2003, p. 56).

The balancing act between paying for higher education and the other adult obligations can be treacherous for the adult student. Hart (2003) reports that, "although potentially damaging to both the educational aspirations and the progress of a traditional-age student, lack of financial skills can end the college pursuits of older students altogether because of their greater financial sensitivity" (pp. 103-104). Institutions can be creative in their own financial aid programs to better the chances of persistence for students who delay. In a study based on creative financial aid policies designed to enhance the retention of adult learners, Hart found,

Even at a very large institution like Ohio State, projects aimed at removing financial barriers to academic persistence prove worthwhile, especially for students with complex family, work, and college pursuits. The results? Improved retention and graduation rates, and fulfillment of the true access mission of financial aid. (Hart, 2003, p. 106)

"The problem of unequal opportunity has proved to be more intractable than anyone anticipated in the early years of the Higher Education Act... financial aid is a necessary but insufficient condition for equalizing college opportunities" (Gladieux & Swail, 2000, p. 690). Policies designed to support the new student in higher education are slow to evolve. These students need means that support their circumstances.

Financial aid policies that are inflexible constrain the choices of non-traditional students who are resource poor before they choose to attend college. The eligibility requirement of full-time attendance for most postsecondary aid, and the administrative challenges associated with negotiating the unfamiliar financial aid highway can seem insurmountable for non-traditional students who may make poor choices due to a lack of support or understanding, or circumstance.

Conclusions

The theories underlying the persistence literature are based on the experiences of traditional students (Astin, 1993; Kuh, 2003,2008b; Tinto, 1975,1993); therefore there is a challenge of compatibility with regard to distinct populations of students whose experiences may not reflect those of students previously studied. Tinto's theory has been criticized especially with regard to a lack of explanatory power for students other than those who are traditional and reside on campus. "We label none of the thirteen propositions of Tinto's theory as reliable knowledge in commuter colleges and universities. None of the thirteen propositions reached the threshold of ten tests needed to ascertain reliability" (Braxton & Lee, 2005, p. 122).

The non-traditional student has distinct experiences from the traditional student who has been studied extensively with regard to persistence to degree completion. The present study is focused on the importance of academic preparation for these non-traditional students with regard to the length of the chronological gap between high school and college. Adelman's model is primarily concerned with academic preparation.

As such, it offers an interesting window on the power of academic preparation for those students who delay college entry.

In order to better understand students who delay, it is important to consider variables that are more pertinent to non-traditional students as identified in empirical studies. The present study will add variables to Adelman's model that have been identified as being associated with persistence for non-traditional students (Aslanian & Brickell, 1988; Bean & Metzner, 1985; Cook & King, 2004; Metzner & Bean, 1987) and are appropriate given the academic context of Adelman's framework.

Metzner and Bean (1987) predicted that the influence of high school performance would be stronger than it turned out to be in their study. They did find some variables to be influential which are academic in nature, but that Metzner and Bean identify as background variables, for example, hours enrolled. Of note is the lack of influence with regard to the social integration variables, which is "in sharp contrast to the expectations for traditional college students (cf. Pascarella, 1980)" (Metzner & Bean, 1987, p. 25). They further found that "none of the environmental or social integration variables was significantly related to GPA, indicating that external matters such as hours of employment, family responsibilities, or on-campus social activities did not affect grades" (Metzner & Bean, 1987, p. 27). Metzner and Bean did find that for non-traditional students, academic integration is more important and that the external communities exert distinct pressures on these students and encourage them to act in more pragmatic ways with regard to their education.

In order to fully support the goal of access for all to higher education, public policy, including financial aid policies and institutional structures, will have to have a broader scope than the needs of the traditional student.

CHAPTER III

METHODOLOGY

This chapter identifies the statistical methods that will be used to demonstrate the associations between the variables which are hypothesized to represent critical persistence factors for the students who delay college attendance. The chapter will begin with a discussion of the conceptual framework used to serve as a foundation for the model, and will also explore the source of evidence selected and the justification for the selection. This chapter will also discuss and defend the chosen statistical methods of analysis and the specifics for the application in the present study. The dependent variable will be defined, as will the selection of the independent variables to study; the limitations and the delimitations of the study will also be identified.

Conceptual Framework- The Toolbox Studies

In effect, the *Original Tool Box* study was a garbage can of suppositions based on the literature about what variables might affect bachelor's degree attainment. Adelman was specifically interested in focusing on college preparation (high school curriculum) which had not been fully explored previously. The supposition of the importance of high school momentum became a theory which was developed based on the results of the first study, and was fortified by responses to criticisms of the first study found in the follow-up study. This is what Wallace (see also Braxton & Hirschy, 2005; 1971) referred to as inductive theory construction- using empirical findings to derive new concepts.

The question studied was, "what demographic, high school performance, postsecondary entry, and postsecondary history (attendance patterns, academic performance) factors are convincingly associated with bachelor's degree attainment for 12th-graders who subsequently attended a 4-year college at any time in their undergraduate careers" (Adelman, 2006, p. 12)? Adelman's studies were published as reports from the U.S. Department of Education, and as such were not subject to the scrutiny of the peer review process prior to publication. However, these reports have been cited often in academic journals and the popular press and have influenced policy initiatives in the secondary and postsecondary environments. "Since its publication in 1999, the *Original Tool Box* has become one of the most frequently cited works in public discussions about- and initiatives to improve- the preparation of students for higher education" (Adelman, 2006, p. 6). Research reports published in peer reviewed journals have not only cited Adelman's reports (Cabrera, et al., 2005; Cabrera & La Nasa, 2001), but some have even used these reports and the theory as a starting point for their own studies (DesJardins & Lindsay, 2008; DesJardins, McCall, et al., 2002). Adelman's theory is a grand theory, seeking to explain graduation rates at all types of institutions for all kinds of students; by comparison, the present study is a middle-range theory as it is concerned with the persistence of a specific sub-population of students (those who delay college entry) (Braxton & Hirschy, 2005). This study is also considered to be a predictive study (Spady, 1971) in that it attempts to identify student potential.

This framework was selected because of its focus on high school academics; high school preparation and momentum: The academic experiences before and during college

and the association of the variables that represent these experiences with persistence for students who delay college is the focus of this work. The academic focus of this research was driven by the research on non-traditional students which clearly specifies that the distinction between these students and their more traditional peers is that they are less likely to be socially integrated into the institution, therefore academic integration is more salient for them.

Adelman's studies will serve as the basis for the model of the study, but the statistical methods will differ. Adelman (1999, 2006) examined the phenomenon of college based on a statistical model which examined the variables he was concerned with in a step-wise regression. Step-wise regression is not considered to be a trustworthy statistical method as the researcher is not selecting the variables based on the literature, but rather can be seen as fishing for associations with too many variables (Derksen & Keselman, 1992). A model that contains too many variables can lead to false associations (Roecker, 1991) which could mislead the research. Instead, this work will focus on variables already identified in the literature.

In addition to Adelman's framework and some of his variables, this study will also consider the literature which is specific to the non-traditional student population (Aslanian & Brickell, 1988; Bean & Metzner, 1985; Kasworm, Polson, & Fishback, 2002; King, 2003; Metzner & Bean, 1987) in order to determine the appropriate variables (hypothesized persistence factors) to study with regard to the population of students who delay college attendance.

The conceptual model for this study is illustrated in Figure 1. This model considers variables that are identified in the literature as salient to students who delay college, while being supported by Adelman's framework as translated into variables available in the BPS dataset. The model will be run twice; once for the subpopulation of students who delay and once for those students who did not delay. The major constructs in this model are:

- delay of college entry;
- student attributes (race, gender, family income, and first generation college status);
- high school academics (highest math taken, standardized test scores, and high school GPA);
- institutional variables (selectivity and control);
- college academics (GPA- 1st yr; credits earned- 1st yr; social integration; academic integration measures- study groups, social contact w/ faculty, meet w/ advisor, talk w/ faculty; and satisfied with instructor's ability); and financial aid (Pell grants, loans, work study and merit aid).

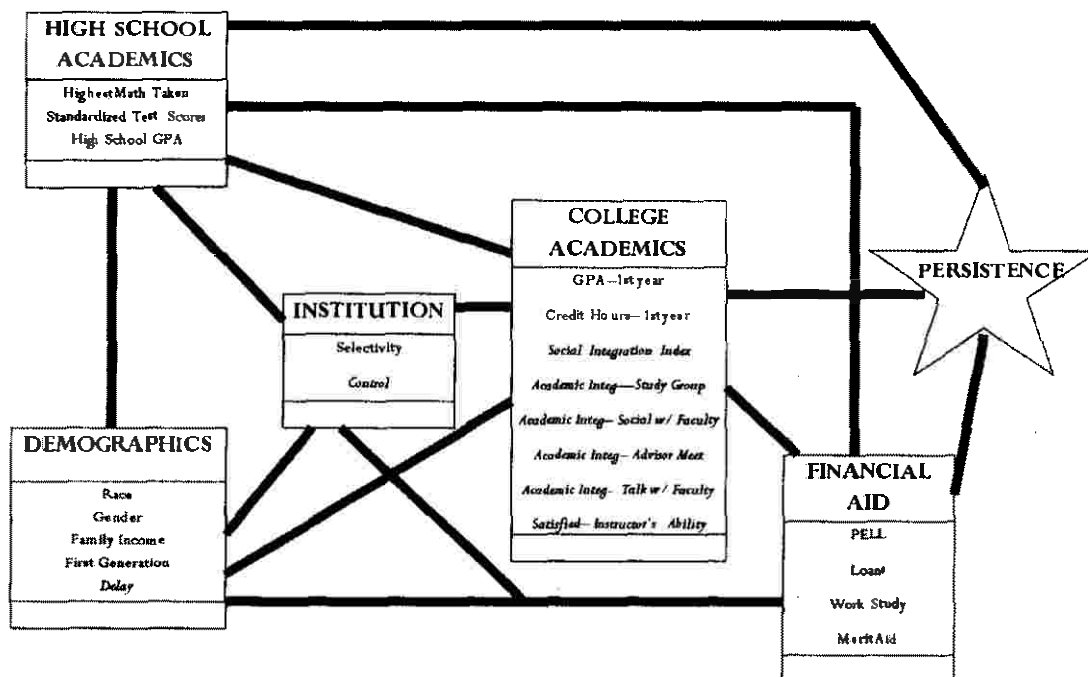


Figure 1 - Proposed Model for Academic Persistence Factors for Delaying Students

Sources of Evidence for System Persistence Studies

A variety of sources can provide evidence to study the concept of system persistence. Governmental agencies, such as the National Center for Education Statistics, an operation of the U.S. Department of Education, recognize the importance of tracking information about student experiences throughout education. They offer several datasets to the public through their website, as well as restricted access data licenses to researchers who meet their criteria. Among the many datasets that NCES provides, several collect information specific to the college-going process. These include the

Beginning Postsecondary Longitudinal Study (BPS) and the Transcript studies used by Adelman, also referred to as the National Education Longitudinal Studies (NELS), which was originally called the High School and Beyond Survey (HS&B).

There are three types of national data sets available to construct longitudinal analyses...the NCES transcript-based grade-cohort study, the Cooperative Institutional Research Project (CIRP) occasional follow-ups to its annual survey of entering college freshmen, and the NCES Beginning Postsecondary Students studies (BPS). (Adelman, 2006, p. 9)

The CIRP Freshman Survey is an operation of UCLA's Higher Education Research Institute (HERI). Over 400,000 first time, full-time freshmen are surveyed annually at two and 4-year institutions in the United States (Higher Education Research Institute (HERI), n.d.). This is the source for *The American Freshman* published each year. This survey can be followed up with additional surveys to study retention, including the Your First Year College Survey (YFYCS) and the Senior Year Survey (SYS). Researchers have used these surveys to study the college student experience. Dey (1990) used this tool to study the importance of institutional characteristics with regard to retention. Alexander Astin has also made use of these survey instruments as his source of data for several studies of the college student experience (Astin, 2006; Astin & Oseguera, 2002).

The U.S. Department of Education also sponsors other surveys of college students in an effort to offer researchers tools with which to study the college going process. The

Baccalaureate and Beyond (B&B) survey begins at the end of college and follows the student through the transition process out of college, but does not consider valuable information about the college going and preparation processes. The High School and Beyond survey was administered between 1980 and 1992, but then not readministered; as such, this survey offers information that may not accurately reflect the most recent changes in the college going population. Additionally, the survey for this cohort began in high school and is thus more traditional. Adelman (1999, 2006) used the NELS-transcript studies for both of his *Toolbox* studies. These studies began with eighth grade students and followed these students in a longitudinal fashion through college experiences. These studies are referred to as the transcript studies because high school and college transcripts are among the data sources for the NELS. This survey focuses on high school and the transition to college and, as it is an age cohort, it is not an appropriate tool to study students who delay college.

An additional national dataset concerned with the student college experience is the National Survey of Student Engagement (NSSE) which is an operation of the Center for Postsecondary Research and Planning at Indiana University. Researchers have taken advantage of this tool as a means to study the college student experience (Kuh, 2005, 2008b), including the engagement experiences and behaviors that can lead to persistence (Kuh & Documenting Effective Educational Practice (Project), 2005).

The Beginning Postsecondary Study is the dataset selected for the present study. This study begins at the beginning of the student's postsecondary career by definition;

this is preferred to the transcript studies for this particular cohort as it is not an age cohort, that is, it is not tied to a recent high school experience. This dataset records precollege information in addition to information specific to the college experience- from surveys of college attendees- which makes it preferable to the information provided by the NSSE dataset. The CIRP- HERI data represents students from more selective institutions (Carter, 2001), and as such is inappropriate for studying the non-traditional student who is more likely to attend less selective institutions (Berkner, et al., 2002). Despite the fact that the CIRP data offer more measures of student interactions within the campus community, the students represented in this dataset were largely what would be considered traditional students (Walpole, 2003) as compared with the students represented in the BPS dataset. Students who delay are clearly more likely to be non-traditional students; therefore the choice of surveys to study this cohort is clear. Carter (2001) used the BPS dataset and the Cooperative Institutional Research Program (CIRP) dataset to compare different measures of aspirations in her study of African American students. "BPS represents a wider range of college attendees and CIRP represents a more traditional student sample" (Carter, 2001, p. 120). The BPS also offered more "complete measures of socioeconomic status" (p. 8) which Carter cited as a strength in her study.

In summary, the BPS: 96/01 is inclusive of non-traditional students in that its survey design includes a more diverse population than does the CIRP. It is also not limited to those students who are coming to higher education directly from high school as is the NELS, ELS, HS&B datasets. NSSE and CPESQR- the datasets focused on student

perceptions and engagement- are missing pre-college variables which are critical to the present study and which can be found in the BPS dataset.

Source of Evidence- BPS Dataset

The source of evidence for this study will be the Beginning Postsecondary Study (BPS: 96/01) which is available to the public online from the National Center for Education Statistics (NCES); however this study will use the restricted data file available to researchers who are granted a license from NCES¹⁵. The BPS provides data which include the responses to a telephone survey of undergraduate students when they first enrolled at the tertiary level, after 2 years and then 6 years after that first enrollment (National Center for Education Statistics, n.d.). Other data made available from this source are either directly reported from institutions (transcripts or IPEDS- Integrated Postsecondary Education Data System), from testing services (ACT or ETS), or from federal financial aid forms or responses to a linked dataset from the Department of Education which is known as the National Post Secondary Student Aid Study (NPSAS, NSLDS). In fact, the BPS is the longitudinal component of the NPSAS. This national data set provides responses regarding many factors pertinent to this study, including demographics, academic resources and academic achievement metrics. This survey is an event cohort survey- the participants all have the event of entering postsecondary study at the same time in common.

¹⁵ This source provides more complete information and individual case information to enable statistical examination using statistical software.

The original survey and collection occurred in 1996 in the context of the National Postsecondary Student Aid Survey (NPSAS). Of this group of students, close to 12,000 were selected for the first survey of this cohort, the Beginning Postsecondary Study (BPS: 96) and subsequently were contacted for follow-ups in 1998 and 2001. As with all surveys, some participants were not able to be found, or did not wish to continue to participate, and the final number of students who participated in all three legs of the survey numbered 8934 (National Center for Education Statistics, 2002). The present study begins with this number of students as a necessity as responses from all three legs of the survey will be used to better understand the student cohort. The present study is designed to specifically examine the population of students who delay entry to college. The BPS variable for delaying entry is based on whether the student graduated from high school before the cohort group did in 1995¹⁶.

The BPS is weighted to approximate the college going population in the United States for the period of 1996-2001.

BPS Dataset versus NCES Transcript Surveys

The sample of students for the BPS was assembled differently from the sample considered for the NCES Transcript surveys, but there may be coincidental overlap. The surveys represent distinct samples of students during approximately the same period in recent history- college attendees in the 1990's. The data come from students who were enrolled in 4 year institutions during the same period, so generational effects should be

¹⁶ Not all students graduated from high school; those who took the GED or completed their high school in another manner would be older than 19 at the time of college entry, and the variable also accounts for students who are older than 19 at college entry.

mitigated, and the results of the present study can be compared with Adelman's results to determine if they are similar, or if Adelman's results might be the product of an anomaly somehow connected to the design of the NELS. This is also the most current complete cohort of information for the BPS, and in a volatile higher education climate the most current information has the most legitimacy.

Adelman used the NCES Transcript Surveys (ELS and NELS) for the *Toolbox* studies. These studies offer extensive information specific to high school course taking and the data sources for these surveys include actual transcripts from high school and college. The Beginning Postsecondary Study (BPS) offers many of the same variables (not always from the same data sources), but also offers some information which is vital to the understanding of the specific subpopulation for the present study. Adelman (2006) recognizes the potential of the BPS for studying student persistence as compared with other student surveys:

The BPS longitudinal studies are shorter (five or 6 years), not dependent on institutional decisions to participate (as is the CIRP), inclusive of students at all ages of entry, and, as befits their principal population sample (a subset of the triennial National Postsecondary Student Aid Study), contain very strong reliable financial aid data. (p. 9)

These students are similar in many ways (see Table 1). *The Toolbox Revisited* begins with over 12,000 students representing 2.93 million eighth graders in 1988, and then only includes those who made it to 12th grade in 1992, and those who entered

Table 1

NELS and BPS Population Comparison

Demographic variable	NELS			BPS	
	1988 eighth-graders	All 1992 survey participants	All 1992 12-graders who entered postsecondary education	All 1992 12-graders who attended a 4-year college at any time and met other criteria to be subjects of Adelman's study	BPS students who attended a 4 year institution at any time and had a bachelor's degree goal study
<u>Gender</u>					
Men	49.7 (1.01)	49.9 (0.83)	46.5 (0.93)	48.8 (1.27)	45.4
Women	50.3 (1.01)	50.1 (0.83)	53.5 (0.93)	51.2 (1.27)	54.6
<u>Race/ethnicity</u>					
White	71.7 (1.50)	71.5 (1.30)	74.9 (1.29)	78.2 (1.31)	71.3
African-American	12.9 (1.26)	12.7 (0.94)	10.3 (0.90)	9.4 (1.03)	9.9
Latino	10.5 (0.87)	10.4 (0.84)	9.1 (0.88)	7.0 (0.72)	11.5
Asian	3.5 (0.32)	3.7 (0.31)	4.8 (0.43)	4.7 (0.42)	6.4
American Indian	1.4 (0.43)	1.7 (0.55)	0.7 (0.23)	0.6 (0.18)	.6

NCES			BPS		
Demographic variable	1988 eighth-graders	All 1992 survey participants	All 1992 12-graders who entered postsecondary education	All 1992 12-graders who attended a 4-year college at any time and met other criteria to be subjects of Adelman's study	BPS students who attended a 4 year institution at any time and had a bachelor's degree goal
<u>Socioeconomic status quintile</u>					
Highest quintile	21.3 (0.92)	21.1 (0.88)	29.1 (1.08)	38.5 (1.52)	22.7
2 nd quintile	20.8 (0.79)	21.0 (0.69)	25.3 (0.88)	26.4 (1.24)	18.7
3 rd quintile	20.7 (1.10)	19.8 (0.68)	20.2 (0.73)	17.7 (0.85)	21.1
4 th quintile	19.6 (0.83)	19.2 (0.66)	15.4 (0.61)	11.7 (0.59)	19.1
Lowest quintile	17.6 (0.93)	18.9 (0.85)	10.0 (0.73)	6.8 (0.50)	18.4

Note. Standard errors are in parenthesis. Columns for gender, race/ethnicity and socioeconomic status quintile may not add up to 100.0 percent due to rounding. Adapted from Adelman (2006, p. 15) - first four columns, and the BPS: 96-01 restricted data files. 1992 12th graders with known socioeconomic status and high school records (transcripts and test scores), who graduated from high school by December, 1996, and attended a 4-year college at any time.

postsecondary education at any time through December, 2000. Further still, it includes only those who presented full information including test scores, high school and postsecondary transcripts and socioeconomic status information to NCES, and ultimately, those who attended a 4-year college at any time (this narrowed the number of students studied to 1.19 million, or 51% of the original sample) (Adelman, 2006).

The population that the current study is most interested in has been defined as those students who delay entry to college. The NELS: 88/2000 began with students in the eighth grade and followed those same students until they were either 26 or 27 years old in December of 2000. This age cohort of students may include some students who delayed college entry, but for a period of no more than 5 years. The BPS is “inclusive of students at all ages of entry” (Adelman, 2006, p. 9; see also Choy, 2002) to college and is therefore the most appropriate data set for the present study.

Universe for Study

Adelman’s universe is larger than the universe will be for this study as this study does not include students who attended high school in 1988, but just those who first enrolled in college in 1996. Comparisons of the two samples can be made by comparing Tables 2 and 3.

Sample

The sample of students considered for the present study represents those students from the dataset who attended a 4 year institution at any time and who have a bachelor’s degree goal- the closest approximation to Adelman’s “anticipations” construct. This study will not use bachelor’s degree goal as a variable, but will rather filter the cases and only consider those who have a bachelor’s degree goal. The saliency of this variable has been demonstrated in many studies and this researcher feels that to include other students,

Table 2

Adelman's Universe and Population from NELS

Description of Universe	Percent	Descending weighted N
A. Initial universe of eighth graders	100	2.93M
B. Of (A), those who were in the 12 th grade in 1992	83.6 (0.98)	2.45M
C. Of (B), those who continued to postsecondary education at any time through December 2000	81.7 (1.28)	2.0M
D. Of (C), those who presented complete high school transcripts, test scores, complete postsecondary transcripts records, and socioeconomic status information.	0.5 (1.01)	1.61M
E. Of (D), those who attended a 4-year college at any time.	73.5 (1.00)	1.19M
Net percentage of 1988 8 th graders in the universe	41	1.19M
Net percentage of 1992 12 th graders in the universe	51	1.19M

Note. Standard errors are in parenthesis. Adapted from *The Toolbox Revisited: Paths to Degree Completion from High School to College*, by C. Adelman, 2006, U.S. Department of Education, Washington, DC. Like other NCES longitudinal studies, the NELS: 88/2000 cohort is a stratified sample, in which each student is assigned a weight to represent other similar students in the cohort (Curtin, Ingels, Wu, & Heuer, 2002) as found in (Adelman, 2006). Test score is based on an "enhanced mini-SAT" that was given to participants, missing test scores were supplemented with converted SAT and ACT scores.

especially adult students¹⁷ who do not have a bachelor's degree goal, is to include students who will artificially lower the persistence rate of the students considered herein (see Table 3).

Only students who attended a 4-year college can ever have received a bachelor's degree or be still enrolled (persistence as defined herein); therefore the BPS dataset will

¹⁷ According to Cook and King (2004), only two-thirds of low-income adults attending college have a degree goal.

be filtered to yield only those students who have ever attended a 4-year institution. The importance of a bachelor's degree has already been noted in the introduction to this research. Other researchers have also chosen to study only students who attend a 4-year institution for similar reasons (Chen, 2007), well as to control for overrepresentation of low-SES students (Walpole, 2003). Additionally, as Tinto would suggest, the dataset will also be filtered to include only those students who have a goal to complete a bachelor's degree.

Not all of the BPS respondents will be considered in this study. This study will begin with limiting the responses to just those students who ever attended a 4 year institution. The sample population will be filtered using the indicator for ever attending a 4 year institution (EN4Y2B) which will change the number of cases from 12086 records to 7246. Further filtering will be accomplished by considering only those students with a Bachelor's degree goal (EPDEGY1); indicates that the student reported an academic goal of a bachelor's degree or better which will effectively reduce the population to 5694 cases representing student information. The final filter to be employed is TESATDER. This variable is an indicator of standardized test scores. The academic preparation variables are reported to BPS from the testing services (ACT and The College Board) in most cases, so consideration of students for which this information will be unavailable is inappropriate. This filter will limit the sample population to 5286 cases, each representing a student's experience in postsecondary education.

Table 3

BPS Sample for the Present Study

Description of Sample from Dataset	Percent	N
A. Initial sample of first time, full time freshmen-BPS	100	12,000
B. Of (A), those who completed all three legs of the longitudinal survey	74.45	8934
C. Of (B), those attended a 4-year institution anytime	60.38	7246
D. Of (C), those who had a bachelor's degree goal	47.45	5694
E. Of (D) those who took a standardized test	44.05	5286

Note. Adapted from BPS Restricted data

Sample Size

Clearly, a subset of the dataset will yield fewer cases. The question is whether the number of cases available will be sufficient for statistical analysis. In an article about the use of logistic regression in higher education research, Peng and So with their associates (2002) recognize that logistic regression is often applied in dissimilar ways. Included in the disparities in the application of logistic regression are the minimum observation to predictor ratios as defined by both the statistical experts and the research papers in the first tier of education journals (Peng, et al., 2002). The ratio indicates that as the number of predictors increases, the number of observations must also increase, but the published research reports disagree on the mathematical equation to determine a ratio that will yield a sample size that will maximize the χ^2 approximation to the sampling distribution.

Agresti (2007) specifically asserts that it is important to note not just the observations, but the outcomes of the observations. For instance, if the data are unbalanced, the smaller number of outcomes should be 10 times the number of predictors used. The maximum likelihood (ML) estimates are likely to be biased if the guideline he suggests is not followed (Agresti, 2007).

Two subpopulations will be examined using binomial logistic regression analysis. The specific sample of delaying students will be examined in a separate regression equation from those students who entered higher education directly after high school.

Delayed Entry

Of the BPS 96-01 students, 23.6% or 2848 students indicated that they had delayed college entry. This continuous variable lists values from 1 to 55 years with a mean of 7.67 years and a standard deviation of 8.68 years according to the Codebook (National Center for Education Statistics, 2002). In order to study this group separately and compare it to those students who attend college directly after high school, a large enough sample size will be necessary to meet the requirements of the model considering all of the variables. After cases with missing variables selected for study are eliminated, the sample size will decrease.

For the purposes of this research, the sample that is of interest is those students who delay college entry. This cohort has been variously defined as (a) those who delay for a year or more beyond high school graduation (Hearn, 1992), (b) those who delay for 7 months (a semester) or more (Adelman, 1999; Adelman, 2006), and (c) those students

who are also older and are often referred to as adult learners or as older students (Bean & Metzner, 1985; Metzner & Bean, 1987; Sandler, 2002). Adult learners are generally identified as those who are 25 years old or older. The present study will define students who delay as those who delay more than 7 months. According to the restricted data files, 2848 students or 23.6% of the BPS cohort delayed entry to college (National Center for Education Statistics, 2002). The variable representing students who delay is just one of many variables offered by the dataset. The dataset was constructed to offer researchers insight into the college-going experience for a variety of students, and, as such, is not limited to those students who delay. A complex sampling design like the one used in collecting the data for the Beginning Postsecondary Study often overrepresents certain students who possess characteristics that are likely to be of interest to researchers in order to have a large enough sample to study (Thomas & Heck, 2001). Unlike more often studied variables (i.e., race/ ethnicity and gender), the variable representing students who delay was not overrepresented, nor likely to have been focused on in such a way as to represent these students as they appear in the population of college students in the US.

Response and Weighting

Declining response rates on surveys hamper the ability of researchers to correct for nonresponse bias. In order to correct for less than perfect response rates, researchers employ weighting techniques to compensate for the missing responses. Dey (1997) reports that these weights generally represent the inverse of the probability of being sampled and having responded (Kalton, 1983). In higher education research, researchers give the greatest weight to those students who most closely resemble the students who

did not respond (Higher Education Research Institute (HERI), 1992). Non-traditional students, in general, are from socioeconomic backgrounds which make them statistically less likely to respond to surveys. Their scheduling issues and complicated lifestyles may make them less likely to take the time required to respond multiple times to a longitudinal survey.

The way the data are collected and manipulated to represent the college-going youth of the nation in a national dataset can intentionally overrepresent or underrepresent groups of students in an effort to create enough cases to study these groups. Complex sampling designs must be accounted for in statistical analyses. NCES provides weighting for the data along with the restricted data for researchers. The variable which is provided by NCES for sampling weight (B98IAWT) will be considered in an effort to make the most statistically correct and valid inferences (Thomas & Heck, 2001). This variable for weight represents the “statistical analysis weight for the cross-sectional analysis of NPSAS 1996 survey data for all students who were determined to belong to the BPS: 96 cohort of first time beginners in 1995-96.” (National Center for Education Statistics, 2002, Electronic Codebook, B98IAWT). This is the weight variable that applies to all 1995-96 respondents. In order for the weight to be successfully employed, it must be adjusted so that the response size is similar to the population that is not weighted. This will be performed by dividing the weight variable by its mean value.

Research Hypotheses

Examination of the two regression equations considering the selection variable representing delaying college entry will test the hypotheses about the salience of academic variables for each population.

Research hypothesis. For all students there exist factors which are statistically more likely to be associated with persistence. Do the associations between the factors vary for students who delay college entry versus those who follow the traditional path to college? The null hypothesis would be that there are no differences in the associations of the factors that are linked with persistence for students who delay as compared with their traditional peers.

Hypothesis 1. For all students, there is an association between high school academic preparation and persistence. How do the relationships among the factors differ when we compare students who delay to traditional students? Stated differently, the hypothesis will hold that students who delay have dissimilar statistical associations between high school academic preparation and persistence than do traditional students. The null hypothesis states that for students who delay college entry, the association between high school academic preparation and persistence will be the same as it is for traditional students.

Hypothesis 2. For all students, there is an association between interactions with faculty and persistence. Do the relationships between these factors differ for students who delay college entry, as compared with traditional students? The null hypothesis in

this instance would be again that there are no differences in the association found between interactions with faculty and persistence for students who delay and traditional students.

Method of Analysis

The dependent variable for Adelman's studies is bachelor's degree attainment. This is a categorical variable with a dichotomous response, yes or no. For the current study, the dependent variable is quite similar, but in the interest of capturing more persistence with a cohort that is statistically less likely to complete a bachelor's degree within the cohort period (due to part-time status or to stopping out), the dependent variable will offer two outcomes, where persistence is defined as either bachelor's degree completion OR being currently enrolled in a degree program and where the antithesis will be defined as no longer being enrolled in a degree program. The criterion variable will still be dichotomous and categorical.

Statistics offer a means to evaluate the individual cases from the dataset in an effort to determine which responses to variables represented are more likely to occur in tandem with the dependent variable. Statistical association does not imply causality, for instance that a better relationship with faculty promotes persistence in college, as there may be another factor that is associated with both of these variables that can cause this persistence- a factor that hasn't been identified. This study will use the statistical tool of logistic regression to determine the associations between the variables wherein the variables selected are based on previous studies and theories about persistence and

represent the experiences of the specialized sample of delaying students. The researcher will refer to previous studies and theories in order to draw conclusions that are empirically and theoretically grounded.

The steps of the analysis will be:

1. Specify the variables that will be examined.
2. Eliminate the cases for which there is no response on any of the selected variables.
3. Recode the responses for analysis as is necessary.
4. Examine the descriptive statistics for the selected and recoded variables, including crosstabs specifically for persistence and delay.
5. Run a VIF Test to determine collinearity between the variables which would confound the results.
6. Construct the model from the variables identified in the steps above and run the logistic regression model for students who go directly to college.
7. Rerun the logistic regression model for those students who delay.

The above step by step process for logistic regression has been identified in Foster, Barkus and Yavorsky (2006) and was modified to meet the requirements of this study.

Descriptive Statistics

Descriptive statistics are useful for characterizing the relationships amongst the focal variables as well as for determining the viability of logistic regression considering

the variables. In order to determine the viability of the selected technique of logistic regression, diagnostic tests must be run on the data to test for multicollinearity (Kleinbaum, Kupper, Nizam, & Muller, 2007) and nonlinearities in the independent variables (Menard, 2002). Independent variables will be tested to eliminate multicollinearity which would mask the effects of some variables. Collinear variables are those which are so closely related that tests of association may produce erroneous results. This is because these variables “are reflecting essentially the same factor” (Stokes, Davis, & Koch, 2000). In order to check how closely the predictor variables are related to one another, the literature suggests that the variance inflation factor (VIF) test is the appropriate statistical technique for determining the collinearity of the variables under consideration (Foster, Barkus & Yavorsky, 2006; Kahane, 2008). As was the case with sample size, researchers are not always in agreement with regard to the acceptable threshold for the VIF test. Foster, Barkus and Yavorsky (2006) recommend a threshold level of 2.0 and Allison (1999) recommends a threshold level of 2.5. This research study will employ the value of 2.0 or higher to screen for collinearity. In order to control for redundancy, this value found between any of the predictor variables will cause one of those variables to be eliminated from the model, based on the literature and the hypotheses.

Crosstabs between the variables will illustrate whether any cells are too small for the logistic regression to be run.

Logistic Regression

The use of several variables to predict the criterion variable would require multiple linear regression; however, the non-metric nature of the variables requires that the more sophisticated technique of logistic regression be employed (Hair, 1979). In the present study, the criterion variable and many of the predictor variables are not metric, but categorical. The literature is clear regarding the use of logistic regression when examining the impact of factors (independent variables) on a categorical outcome variable. "Logistic regression...is well suited for the study of categorical outcome variables, such as staying in or dropping out from college" (Peng, et al., 2002, p. 260). According to Foster, Barkus and Yavorsky (2006), the logit distribution is preferred over the probit distribution because the logit distribution does not have a normal distribution requirement as does the probit distribution, and the logit distribution is thus more flexible. For the analysis of categorical variables, there is a general consensus regarding the superiority of logistic regression in terms of accuracy of classification and prediction to ordinary least squares (OLS) regression (Fan & Wang, 1999; Peng, et al., 2002).

Many other researchers who consider student persistence have conducted their research using logistic regression. Some have studied ability to pay in this manner (Cabrera, et al., 1990), or price response (Kaltenbaugh, et al., 1999), whereas others have used this technique to study year to year persistence (St. John, Kirshstein, & Noell,

1991). Hu and St. John (2001) used logistic regression to measure within year persistence and race through an economic lens.

The Delta-p statistic is defined as “the predicted *changes* in probabilities resulting from *changes* in independent variables” (Petersen, 1985, p. 130). The odds ratios represent the “odds that X will happen given a unit of change in the independent variable to the odds of X not happening” (Adelman, 2006, p. 11). Other authors caution that odds ratios are not exactly the same as the odds of an event occurring (Peng, et al., 2002). “The odds multiply by e^{β} for every one unit increase in x. That is, the odds at level $x+1$ equal the odds at x multiplied by e^{β} ” (Agresti, 2007, p. 104). Odds ratios can be tested for significance against the null hypothesis (the ratio of 1 indicates that there is no relationship between the variables) by using the Wald test (Foster, et al., 2006).

Research Variables

Do the independent variables predict (considering random behavior will cause some errors) whether the student is more likely to be persistent or not? An examination of the literature representing persistence and attainment for students in general combined with the literature focused on non-traditional students has led to the hypotheses that those variables which represent academic preparation and academic integration will be potent for the students who delay college entry. Adelman cautions us to “Keep in mind that ‘variables’ are representations of realities (e.g., first-year college grades) or constructs (e.g., transfer)” (Adelman, 2006, p. 18). It is these realities that the statistical analysis

will test in terms of association with the reality of student persistence. In other words, the statistical analysis allows us to mathematically test the connection between these realities and constructs and the persistence of the student who delays college entry.

"Within the inferential framework, the null hypothesis states that β equals zero in the population. Rejecting the null hypothesis implies that a relationship exists between X and Y " (Peng, et al., 2002, p. 263). Each variable studied has an implied hypothesis as a relationship is being tested. The hypotheses being studied in this paper are that there are identifiable factors which are convincingly associated with degree completion for students who delay college entry. More specifically, in the aggregate for students who delay, there are pre-college and during college academic factors which are more likely to be associated with completing a bachelor's degree or remaining enrolled than with a failure to meet these goals *and* these are hypothesized to be distinct from similar associations for traditional students. Accepting the null hypothesis would indicate that the factors are the same for both populations of students.

Please note that all of the italicized variables in the tables are those that were added to Adelman's framework in response to the literature on adult students.

Dependent Variable: Bachelor's Degree Completion or Enrollment

In this study, the outcome variable of persistence as defined as degree attainment or continued enrollment is hypothesized to be dependent on the value of the other

variables under consideration (independent variables or predictors) in each instance. Given the variable nature of attendance for students who delay entry, this approach is justified- the condition of still being enrolled at the end of the cohort period indicates that the student continues to be persistent- because the cohort period (6 years) may be too short to properly gauge the persistence of non-traditional students.

Bean and Metzner (1985) caution researchers to choose the definition of attrition carefully. They chose semester to semester attrition as have many other researchers; however, the present study is interested in long-term persistence. The difference in operational definitions accounts for the inconsistencies in results from research study to research study.

The criterion (dependent) variable is identified as representing students who either graduated with a bachelor's degree or were still enrolled at the end of the cohort period where this outcome is coded as 0. For those students who were no longer enrolled and did not complete their bachelor's degree, the outcome is coded as 1.

Independent Variables

The variables of interest in this study are those academic variables which might be associated with the persistence of the students who delay college entry. Examination of the two regression equations for the distinct subpopulations will determine whether to reject the null hypothesis.

Every study has to include variables that have been identified in other research as having import with regard to student persistence as defined herein. These variables act as control variables in most studies, so that the focal variables can be considered while the other factors that have been found in other studies to affect persistence can be held constant.

Focal variables. The literature about the adult student indicates that these students are less likely to be involved in the social structure and activities associated with the community of college. Academic preparation and integration variables are the focus of the present study. These variables will be examined in the context of delaying versus traditional students in an effort to determine critical persistence factors for students who delay.

High school academics. As learned in the literature review, educational anticipations are very important in predicting degree attainment. The present study filters the population for degree goals which is the closest approximation to this construct; therefore the variable will not be included as a predictor variable in this study.

Math was so salient for Adelman's population that it will be interesting to explore the strength of the association of this variable with bachelor's degree completion or continued enrollment for the student who delays. Adelman found that this variable was most potent when it represented those courses beyond Algebra 2. The present study will also examine this variable considering this level of study as a critical point.

Standardized test scores are another tool for measuring high school background and student potential. The Transcript Studies were combined with a test that was given in conjunction with the data collection (Adelman, 1999; Adelman, 2006); however, the BPS relies on standardized test scores as reported by the ACT and the College Board- SAT. The Transcript Studies mini-SAT was designed by drawing items from older SATs and adding some civics and science questions. The composite score reflected the answers to the SAT questions which were designed to measure core reading, vocabulary, writing and mathematics ability (Rock, et al., 1985). The BPS variable, TESATDER, reports SAT standardized scores of both the SAT and the ACT, whichever was taken by the respondent.

Adelman reports a combined variable for class rank and GPA as reported by the student. Adelman's rationale is that the class rank compensates for the uneven grading from school to school, and that GPA can fill in the blanks for students who attend high schools that do not offer rankings. Adelman (2006) considers GPA and Class rank together as one variable which he reports in quintiles. The BPS dataset offers these as individual variables; however, the ACT class rank is reported in quartiles and the SAT class rank self-report variable is reported in quintiles. Absent the raw data, or a continuous variable for one or both of these variables, the two variables cannot be logically transformed into a new variable that accounts for class rank. This study will consider GPA only. The BPS variable HCGPAREP is reported as seven response values

representing average grades for the student (e.g., A- to A is represented by the response numbered 7). This variable will be transformed into three dummy variables¹⁸.

The high school academic variables that will be used to examine this construct from the BPS are listed in Table 4.

College academic variables. The number of academic interactions in the freshman year is quite formidable and represents an important set of demands that a successful student will have to meet. All of these interactions could not possibly be documented in one database, but the variables chosen by NCES for this portion of the

Table 4

Focal Variables- High School Academic Factors

Independent Variable: High School Academics	BPS: 96-01 Variable Name	Type of Variable
Highest level of High School Math	HCMATHHI	Categorical: 5 response values
Standardized Test Score Rank	TESATDER	Continuous: 400-1550
High School GPA	HCGPAREP	Categorical: 7 response values

Note. Adapted from National Center for Education Statistics: BPS: 96/01 Beginning Postsecondary Survey Restricted Data files.

See Appendix B for the construction of the variables to be employed for statistical analysis. All of these variables are sourced from the ACT or SAT questionnaires; the BPS offers no high school academic information for those students who have not reported scores from either test.

¹⁸ Specific variable construction information can be found in Appendix B.

student experience are broadly representative, and could validate previous studies and provide insight for future studies in this area. Certainly, many freshmen experience academic problems.

Freshman year grades are important indicators of the student's academic fit in the institution, as well as a means to build the confidence of students who have fared well academically. Adelman found that freshman grades had a positive association with bachelor's degree completion. This information is available in the BPS dataset both directly from institutions and as a response to a telephone survey that was administered in 1998.

The present study will examine the number of credits earned during the first true year of higher education based on a threshold set at 20 credits which Adelman determined to have a positive association with degree completion. The variable CREDHRS is a continuous variable that can be manipulated to reflect the 20 credit minimum that Adelman found so critical with regard to degree completion. This is a true representation of momentum as Adelman defines it, and is a reflection of common knowledge of the definition of academic momentum. In college several things can hamper this kind of momentum; for the adult student population this credit threshold indicates an approximation to a commitment to full-time status. Considering remediation and starts and stops which are more prevalent for delayers (Aslanian & Brickell, 1988),

completing this number of credits given external pressures is indicative of a considerable commitment to the goal of completing a degree.

Hypothesis 2 posits that for the student who delays college entry, academic integration and faculty interaction will be potent predictors of student persistence and that these variables will have a distinct association for students who delay as opposed to their traditional peers. Chen and DesJardins (2008) include indices of academic and social integration in their study. These indices are the composite variables available in the BPS dataset. The present study will also include social integration in order to assess the relative impacts of both types of integration on delaying students versus traditional students. The academic integration index includes many of the faculty factors above and some other academic measures. Two of the included variables in the academic integration index measure faculty contact. These measures represent responses about social versus more academic contact with faculty. The index also includes a response about meeting with an advisor and one about participating in a study group (National Center for Education Statistics, 2002). The BPS indicators of these factors represent the student's reflection on the freshman year. Aslanian and Brickell (1988) specifically noted that adult students place great import on the ability of faculty to teach. This led to identifying a variable to represent this experience for the respondents. The faculty variables are likely to represent similar constructs for the students answering the survey, if so, the descriptive statistics will identify collinearity and variables may be excluded

Table 5

Focal Variables- College Academic Factors

Independent Variable: 1st Year Performance	BPS: 96-01 Variable Name	Type of Variable
Freshman Year Grades	GPA	Categorical: 8 Responses
Number of credits earned freshman year	CREDHRS	Continuous: 1-60 credits
Climate: Social Integration	SOCINT	Continuous: 1-300
Climate: Academic Integration Study Group	CMSTUDGP	Categorical: 3 responses Never, sometimes and often
Climate: Academic Integration Social Contact with Faculty	CMSOCIAL	Categorical: 3 responses Never, sometimes and often
Climate: Academic Integration Advisor Meeting	CMMEET	Categorical: 3 responses Never, sometimes and often
Climate: Academic Integration Talk with Faculty Outside of Class	CMTALK	Categorical: 3 responses Never, sometimes and often
<i>Satisfied with Instructor's Ability</i>	SITEACH	Categorical: 2 responses y/n

Note. Adapted from National Center for Education Statistics: BPS: 96/01 Beginning Postsecondary Survey Restricted Data files. See Appendix B for the construction of the variables to be employed for statistical analysis. Variables listed in italics are those added to account for the non-traditional student focus of the present study.

from the inferential examination because of this. The focal variables considered to represent the college experience for students are listed in Table 5.

Control variables. Demographic variables. Many studies about students begin with demographic variables. Where a student comes from can help to predetermine

outcomes for that student. Researchers study the demographic characteristics of students as these have been found to be associated with persistence. Adelman (2006) found that first generation college status was the most significant ($p < 0.01$) of the demographic variables with regard to degree attainment; “the probability of completing a bachelor’s degree is reduced by roughly 21 percent for first generation students.” (p. 26)

Although delaying college is considered to be a demographic variable, it will be considered as the selection term for the two logistic regressions in the present study as discussed earlier in this chapter.

The demographic variables that will be considered as control variables for the present study are listed in Table 6.

Institutional variables. Institutions differ in many ways and these differences often contribute to attrition for individual students in one way or another. The point of enrollment for college attendees demonstrates acceptance into an institution and student choice of that institution. If the choice is well-considered on both sides of the decision-making process, the prospects for a successful educational partnership are enhanced.

The variety and variability of institutions of higher education in the United States is a fact. What makes institutions unique can either promote student persistence, or not.

Selective institutions benefit, in general, from a better prepared student body and from peer effects. BPS offers a variable that identifies institutional selectivity of the first

Table 6

Control Variables - Demographics

Independent Variable: Demographics	BPS: 96-01 Variable Name	Type of Variable
Race	SBRACE	Categorical: 6 responses
Gender	SBGENDER	Categorical: 2 responses male is reference = 1
Family Income	PCTALL2	Continuous: 1-100 percent
First Generation	ESMPSE	Categorical: 2 responses some college = 1
<i>Dependents</i>	XADEP95	Categorical: 2 responses n/y
<i>Delay</i>	ENDELAY	Categorical: 0, 1, -9 n/y

Note. Adapted from National Center for Education Statistics: BPS: 96/01 Beginning Postsecondary Survey Restricted Data files. See Appendix B for the construction of the variables to be employed for statistical analysis. Variables listed in italics are those added to account for the non-traditional student focus of the present study.

institution attended in quartiles.

The control of the institution will also be considered as an addition to better tailor this study to non-traditional students. Overwhelmingly, non-traditional students attend public institutions, so inclusion of this variable may serve to better inform us about the interaction of the control of the institution and persistence for the non-traditional student.

Financial aid. The BPS dataset is a follow up study to the NPSAS (National Postsecondary Student Aid Survey) and, as such, offers many variables to study which represent financial aid. Adelman used three dichotomous variables which represented

Table 7

Control Variables- Institution

Independent Variable: Institution	BPS: 96-01 Variable Name	Type of Variable
Selective Postsecondary School	INSTTIER	Categorical: 4 response values
<i>Institutional Control</i>	INTPCT	Categorical: 3 response values, public, private NFP, private FP

Note. Adapted from National Center for Education Statistics: BPS: 96/01 Beginning Postsecondary Survey Restricted Data files. See Appendix B for the construction of the variables to be employed for statistical analysis. Variable listed in italics are those added to account for the non-traditional student focus of the present study.

whether a student ever received grants, loans or work study aid and found that none of these warranted inclusion in the final model. The association of work study and degree completion was modest, but did not reach the threshold set by Adelman for inclusion when the next sequences were considered.

The present study will consider variables to represent these three methods of financing using the BPS dataset. The level of detail available in the BPS with regard to financing will be taken advantage of. The variables will be examined by converting the responses to z-scores, this represents a substantial improvement on Adelman's dichotomous financial aid variables. Because the focus of the study is academic, an additional variable from the BPS will be added to represent merit aid.

Need aid is represented by the BPS variable that is labeled PELL96. This represents the need-based federal grant.

Table 8

Control Variables- Financial Aid

Independent Variable: Financial Aid	BPS: 96-01 Variable Name	Type of Variable
Pell Grant (95-96)	PELL96	Continuous: 0, 133-2340
Loans (95-96)	TOTLOAN2	Continuous: 0, 85-41428
Work Study (95-96)	TOTWKST	Continuous: 0, 62-5800
Merit Aid (95-96)	MERITAID	Continuous: 0, 60-27233

Note. Adapted from National Center for Education Statistics: BPS: 96/01 Beginning Postsecondary Survey Restricted Data files. See Appendix B for the construction of the variables to be employed for statistical analysis.

The first year was selected for consideration as it is important for the selection of an institution for rational actors, and the figures for student budgets and the different forms of aid may change from year to year. The financial aid variables selected for this study are listed in Table 8.

Limitations

All studies are limited in some ways by the choices made by the researcher. In the present study, the choice of the dataset to be examined to answer the research questions was deliberate based on what was available and the interests of the study; however, no dataset is perfectly suited to a study unless the survey instrument was designed with a particular purpose in mind.

Researchers have noted the importance of studying the phenomena of student behaviors via the lens of self-selection (DesJardins, McCall, et al., 2002). Certainly, the behaviors of students from the earliest ages are predicated on their predispositions toward their futures. Children who will not become first generation college attendees' exhibit behaviors which are based on cultural capital that is so engrained it cannot be denied, and sometimes it is not quantifiable. For the purposes of the present study, the author recognizes this as a limitation, but also notes that self-selection is a precursor to educational aspirations. As noted in Chen's (2007) study, unobserved factors that influence the focal variables in this study, delay and the academic indicators, both individually and in various combinations may also be independently related to the outcome of persistence as defined by the present study.

BPS Limitations

Datasets are designed with the existing literature in mind, as well as continuity of the dataset from cohort to cohort in mind. As such, the search for new knowledge using these sources is somewhat limited by what has already been considered. Although the BPS: 96-01 was selected as the most appropriate tool to conduct this research, a few concerns specific to the dataset merit discussion.

The *Toolbox* studies define the first year as beginning in the month following first enrollment in the "true" first institution. A look at the descriptive statistics of fall enrollments versus other periods indicates that minority (African-American, Latino and

Native American students) and students from lower socioeconomic quintiles are more likely than their counterparts to begin postsecondary education at times other than the fall term, so any study that limits its scope to those students who begin in the fall has a source bias (Adelman, 2006). Aslanian and Brickell (1988) also take issue with the fall focus of most national datasets (including the BPS) in that they are slanted to reflect more the traditional student: Adult students, like minority students, enroll disproportionately in the spring as compared with their traditional peers. The design of the *Toolbox* studies is such that false starts are discounted and the studies consider instead the “true” first institution. The BPS design is also limited in that it does not account for false starts, and thus may include some respondents who began a semester and immediately left.

As with all datasets, the information gathering may be imperfect in terms of data entry or the source of the information. For instance, gender is imputed from the student’s first name where the specific information is not available (National Center for Education Statistics, 2002). In a dataset with close to 6,000 distinct variables, this may be necessary, but given the importance of gender in the literature and general culture, this can lead to unnecessary errors in data that might affect the results of any study.

In addition to the concerns above that are specific to the present study, researchers have taken issue with reports generated by NCES specific to these studies (Heller, 2004). Heller specifically is concerned about the 4 year college focus of the datasets and the lack of information about costs, financial aid and the decision to attend college or not.

The omission of financial data other than family income renders these NCES studies suspect in ways even more severe than those recognized by Heller....the bias depends on the values of the omitted variables, given the included variables, and the parameters of the omitted variables. (Becker, 2004, p. 69)

As has already been noted, the Transcript surveys and the BPS are distinct, not only in terms of the survey population, but more importantly in terms of the questions posed and the information sources. The composite variable that Adelman found so compelling cannot be replicated with the BPS dataset. Many of the component variables are available, and these will be examined in the present study.

Standardized test concerns. The High School and Beyond/ Sophomore cohort and the eighth grade NELS: 88/2000 used a test administered to all students included in the survey population. This test is not a part of the BPS survey instrument, and cannot be used to compare. Often, standardized test (ACT and SAT) scores are used to determine admission to postsecondary education; however, "nearly half the students in the BPS studies did not take either exam" (Adelman, 2006, p. 10). Many of the BPS students began their postsecondary education at community colleges where these standardized test scores are not a part of the entrance requirements. Close to 82% of the schools in the BPS: 95/01 required one of the standardized tests as a requirement for admission (National Center for Education Statistics, 2002). The high school curriculum variables available in the BPS datasets come from the questionnaires administered in conjunction

with the ACT and the SAT; those students who did not take these tests will be excluded from this analysis as this is the focus of this research.¹⁹ It is suspected that the students who delay will be less likely to have taken these standardized tests and this is cause for concern. There are a growing number of institutions that do not require these tests (Atkinson & Geiser, 2009) for various reasons, so these variables will naturally exclude from the statistical examination those students who chose not to take the tests. This will further limit the number of students studied; in particular, those students who chose the community college first route to bachelor's degree may not have ever taken a standardized admission test. According to the BPS Codebook- this variable is derived from an IPEDS variable- 2080 students attended first institutions that did not require either of these standardized test scores for admission (National Center for Education Statistics, 2002).

This study is only concerned with those students who study at some time at a bachelor's degree granting institution and who are interested in the goal of a bachelor's degree, so perhaps this limitation will be tempered by considering only students who make these choices. If these choices have made study sample statistically distinct from the BPS population, then the external validity of the study is compromised and the results of the study will not be generalizable to the population of college students in the US during the cohort period.

¹⁹ 28.2 percent of the respondents report no score for standardized tests (National Center for Education Statistics, 2002, see Electronic Codebook, TESATDP2)

Self-reports. The source of information for the dataset has important ramifications for the validity of the data contained therein. The transcript studies gather most of their information from institutional transcripts, whereas the BPS relies heavily on computer assisted telephone interviews which depend on the sometimes unreliable memories and honesty/ candor of students. As such, the validity of the responses is compromised by the limits of memory and character with regard to recall (Kahn & Nauta, 2001). If however, perception is reality, the perceptions imbedded in the interview-style responses have value to the extent that they represent the students' view of reality which has been indicated in some studies to have great import in student decision-making (e.g., whether to reenroll or not) (Aitken, 1982; Bean, 2005). Kuh (1994) acknowledges this concern, but notes that this is really the only mechanism that researchers have to study certain types of student behaviors. There is certainly validity to measuring student perceptions with regard to the educational process and the indirect effects of those perceptions on behaviors.

Much has been written about self-reporting and accuracy of the information gleaned (Baird, 1976; Berdie, 1971; Pike, 1995). Researchers are particularly concerned with whether the student has enough information to properly respond to and understand the question posed (Wentland & Smith, 1993)²⁰, or whether the students choose not to answer truthfully as the truthful response is somehow embarrassing to reveal (Bradburn

²⁰ Adelman (1999) notes that student data is "uneven and unreliable" with regard to information about their parents, citing that few student responses agree with parental responses about parental education levels.

& Sudman, 1988).²¹ This phenomenon is similar to, but not exactly the same as the halo effect, wherein respondents inflate their performance when reporting²². Pike (1999) noted the halo effect, but also considered that across schools and students this effect was consistent enough to not distort comparisons between groups. Horn and Kojaku (2001) used the BPS 96 to identify precollegiate information; they note that the original data source is the college entrance examination surveys (SAT and ACTs)- which are student reported. The reality of this data set and its sources will limit the internal reliability of this present study as compared with a study based on verifiable transcript sources, which may also limit the reliability of the relationships observed in the present study (Cabrera, et al., 2005).

A combination of the concerns for standardized test reports as a source and student reported data creates an additional concern with regard to missing data.

Time to degree. The time period of the BPS study may be a limitation to this study as students are taking longer and longer to complete a degree (Peter & Carroll, 2005a). Some studies of persistence are using a longer cohort period (Cabrera, et al., 2005) to combat this effect. Particularly for students who are more likely to not enroll in full-time consecutive semesters, this may inhibit our ability to truly understand this

²¹ Adelman (1999) reports that with regard to remediation, only 15 percent of the BPS students acknowledge having taken a remedial course, whereas during the same period of time the transcript studies note that 46 percent of students took at least one remedial course.

²² Fetters, Stowe and Owings (1984) note that students claim to have taken more coursework than their records demonstrate.

important population of students. Schuh (2005) notes that only 52 percent of the students attending higher education in 1999-2000 attended full-time; part time attendance at any point would increase the difficulty in completing a degree within the cohort period. Horn and Berger (2004) also note an increase in the percentage of students still enrolled 5 years after beginning their postsecondary studies. In addition, the BPS only includes students who are enrolled full-time during that first semester of the cohort period in 1996. As we have learned, there is a recognized trend of students who delay and adult students attending part-time (Hussar & Bailey, 2007; Paulson & Boeke, 2006); this may have left valuable cases unstudied.

Astin and Oseguera found that their model lost predictive ability as the time to degree increased.

Note, however, that the multiple correlation coefficients (R) decline as the length of time to degree completion increases. What this means, in essence, is that the most stringent measure--completing a bachelor's degree within 4 years--is easier to predict than the other two measures. (Astin & Oseguera, 2002, p. 24)²³

In a very early national study of retention, Astin (1975) found that students who took longer to complete a bachelor's degree than 4 years more closely resembled those who never finished their degrees as opposed to those who finished within 4 years. This

²³ The other two measures are 6 year degree completion and degree completion in more than 6 years.

demonstrates that students who complete their degree on time behave differently from those who take more time.

Freshman year focus. There is a concerted focus on the freshman year in the BPS dataset. The literature recognizes the importance of this period as a time of transition in a person's life; what Tinto would term leaving one community to belong to another. This is particularly potent for traditional students and the literature reflects what has already been determined for traditional students. This makes the study of disparate populations of students challenging as researchers are often forced by circumstance to use the traditional student lens to observe the new student, here represented as the student who delays college entry. Perhaps financial aid variables and academic variables, particularly faculty contact, have distinct timing implications for students who delay. Researchers have just begun to examine the longitudinal nature of the college attendance process (Chen & DesJardins, 2008; DesJardins, et al., 1999; DesJardins, Ahlburg, et al., 2002; DesJardins, McCall, et al., 2002); but non-traditional students have not yet been studied in this manner and the national datasets lack necessary variables to allow this.

Study Design Limitations

Students are changing at a remarkable pace. What can be learned from the examination of this cohort in the BPS may or may not be true for other cohorts (Cabrera, et al., 2005). We can, however, compare the results to those found by Adelman to verify some of his findings as they represent students attending college during the same years.

The focal variables identified for this study are freshman year responses. The importance of the freshman year is well documented in the literature. The BPS follows this pattern and offers survey questions about academics based on first year experiences. The GPA variable used in the present study is also a response about freshman year as this researcher believes that this is an important measure of persistence and integration into the community of the institution. Adelman notes the importance of looking beyond the freshman year to what he terms the “far side of the postsecondary matriculation line”, as do Nora, Barlow and Crisp (2005). In fact, Adelman (2006) offers the notion that academic momentum hiccups in the first year might be made up in the second year toward a bachelor’s degree. Unfortunately, Adelman does not follow through with this continuation of the examination of academic momentum at a later point in time, and this is a limitation to his study. The present study is similarly limited. The BPS and Adelman both focus on freshman year, as does this study.

Delimitations

All studies are limited to some degree by the resource limitations of the researcher. This study is no exception. The research has been conducted as part of a doctoral program which has time constraints built in. Finances are also a concern for most graduate student studies; fortunately, a free national data set is a tremendous resource for graduate students and other researchers.

The original plan was to conduct a rigorous statistical examination of the data using interaction effects between the variable representing delay and the focal variables. Interaction effects are difficult to interpret and this plan required modification in the interests of time. In place of the interaction effects, the population was instead examined based on the selection variable delay, which produced two separate final equations, one for the subpopulation of students who did not delay and one for the population of students who did report delaying their college attendance.

The study of student behaviors is vast; this is particularly true with regard to persistence which is important to so many actors in higher education and thus studied often. The present study is not exhaustive with regard to the literature reviewed, although this author believes that the most pertinent studies have been considered and cited.

CHAPTER IV

DATA ANALYSIS

Variables

The first step of the analysis is to identify the variables from the dataset that will be used. Each variable has been selected carefully with the literature in mind. After all variables are identified, it will be necessary to eliminate the missing cases from each variable. When this is complete, the numbers of cases left are those which will be subject to descriptive and inferential analyses.

Each variable for study will be transformed as is necessary. Many of the variables for consideration are categorical as reported from BPS and will be transformed into dichotomous dummy variables wherever possible. Some of the variables are continuous and, as such, offer more complexity; in most instances, these variables will be transformed to standardized values using z-scores.

The transformed and recoded variables will be examined using descriptive methods; crosstabs will be run for the variables to ensure that the cells are large enough to run the regressions. The VIF test will be used to highlight any variables which might be collinear.

Missing Data

In all datasets there are cases with missing information. The researcher has several options according to Allison (2002) for handling this statistical complication, listwise deletion, dummy variable adjustment and single imputation. Listwise deletion is the simplest and the most often employed, but can cause important information to be censored out of the data available for analysis. This study will use listwise deletion. Other methods, including single imputation and multiple imputation are complicated and can require additional software (Chen, 2007). Listwise deletion requires that where the response for any variable is missing from the original dataset, the entire case must be eliminated from consideration.

There are consequences to listwise deletion. The listwise deletion may change the sample population in comparison with the original population. This may limit the generalizability of the study results to the population of college students in the US. It is important to note that within the sample population, even though the population was filtered for having reported a standardized test score which is the source of the data for the high school GPA variable, there are additional missing responses (538, or 10.2%). The effective final sample is 4164 cases representing the remaining number of students.

Descriptive Statistics

The examination of the sample population is made possible with descriptive statistics. This allows the reader to see what the overall makeup of the sample population

is. The VIF tests confirmed that all variables could be kept in the model as there was no evidence of collinearity. This study will employ descriptive statistics to list all variables considered and to demonstrate the range of the transformed and recoded variable responses.

The sample population is more likely to be persistent than not (78.2%). This is much higher than the persistence rate for the overall BPS population (46.9%) which can be attributed to the variables used to filter this population for study. These are the students who ever enrolled in a 4-year institution and who had a bachelor's degree goal, and had a score reported for them from either ETS or ACT.

The sample population is predominantly White and Asian students (81.6%) and these race/ethnic populations have been consistently associated with persistence in college. The sample population is similar with regard to gender (females) to the population of college attendees from the BPS original sample (56.2% to 56.4%, respectively). The income variables demonstrate the differences between this sample population and the BPS population. The income variable is a percentile figure based on all students in the sample where dependent and independent students are calculated separately. This would mean that the bottom 25% should be fairly close to 25% of the students in the BPS sample.²⁴ In fact, for the sample population, the lower 25% of all students in the BPS sample is 18.8%, whereas the upper quartile reports only 29.6% of the responses. The difference between these samples with regard to this variable and income might indicate

²⁴ Note that the reported mean is 48.6, not 50 (National Center for Education Statistics, 2002).

that the sample population is skewed perhaps from the listwise deletion, or perhaps because the data have not been weighted yet for analysis. The response which represents whether the student reports having dependents is quite small, with only 1.5% of the sample population or 62 students reporting that they have any dependents. This very small positive response concerns the researcher so much that this variable will be eliminated from further consideration. This will effectively leave 26 variables to be considered after transformation, cleaning, and recoding. The response representing delay is small (6.3% or 263 positive responses) which is of concern as this represents the students that are too often overlooked.

A very large proportion of the students report having taken Algebra 2 or a more difficult math class in high school (93.9%); this seems surprising given Adelman's results. Given the import that the *Toolbox Studies* placed on this threshold for high school course taking, this seems very high. An examination of the BPS population reveals that 65.2% report taking Algebra 2 or higher, but that 35.2% of the sample did not respond to this question. As has already been identified, the sources for the high school curriculum variables for the BPS are the survey responses from the SAT and ACT standardized tests. Similar concerns are associated with the high school grade point average responses of A's (43.1%), B's (34.8%) and C's or lower (22.1%). Students who have taken these tests are likely to be those who fared well academically in high school, although Adelman (2006) would certainly argue that grading and curricular

Table 9

Descriptive Statistics for the Sample Population Categorical Variables

PERSISTENCE	%	# of Students
Graduated or Still Enrolled	78.2%	3245
Did Not Persist	21.8	919
DEMOGRAPHICS		
Race: White/Asian	81.6	3396
Race: Other	18.4	768
Gender: Female	56.2	2339
Male	43.8	1825
Income: Top 25%	29.6	1232
Middle 50%	51.6	2149
Bottom 25%	18.8	783
1st Gen: Yes	27	1126
No	73	3038
Dependents: None	98.5	4102
Any	1.5	62
Delay: Yes	6.3	263
No	93.7	3901
HIGH SCHOOL ACADEMICS		
Algebra 2 or Higher	93.9	3909
Below Algebra 2	6.1	255
High School GPA: A's	43.1	1793
B's	34.8	1447
All else	22.2	924
INSTITUTION		
Selective	13.8	576
Not Selective	86.2	3588
Public	63.4	2642
Private	36.6	1522
COLLEGE ACADEMICS		
20 or More Credit Hours 1st Year	91.2	3797
Less than 20 Hours Earned 1st Year	8.8	367
Participated in Study Group	77.4	3224

PERSISTENCE	%	# of Students
No Study Group	22.6	940
Social Contact w/ Faculty	54.9	2287
No Social Contact w/ Faculty	45.1	1877
Met with an Advisor	88.7	3695
Did Not Meet w/ Advisor	11.3	469
Talked w/ Faculty	86	3581
Did Not Speak w/ Faculty	14	583
Satisfied w/ Instructor's Ability	90.7	3776
Not Satisfied	9.3	388

standardization inconsistencies might challenge the researcher with regard to using the BPS data as opposed to the Transcript data. The standardized test score variable (see Table 10) also reports a high mean score for the sample population of 924 as compared with the BPS mean of 927, clearly all of these students in both samples will have taken the standardized tests, but the other, non-related filtering variables will have made the difference reported for the sample population.

Of the students in the sample population, 14% attended a selective institution, defined for this sample population as the top two highest test score quartile institutions as defined by the Common Data Set as representing students from the top first and second quartiles of SAT or ACT scores.²⁵ Sixty-three and three tenths percent of the sample population attended a public institution; this variable was added to better specify the characteristics of non-traditional students.

²⁵ The top 25% is identified as being above a score of 1200 on the SAT, whereas the second tier represents those scores between 1100 and 1200 (National Center for Education Statistics, 2002).

With regard to academic variables associated with attending college, 91.2% of the sample population reports having earned 20 or more credits in the first year of study. This variable represents a commitment to the goal of a degree, as well as it represents full-time student status for at least part of the first year. In Table 10 the continuous variable representing first year grade point average lists 2.69 as its mean. This represents between a C and a C+ for the average student in the sample population. Table 10 is where the continuous variable representing social integration can be found. The social integration index from the BPS is a composite variable that represents the responses to a number of questions designed to measure the social integration of the student such as “Did you participate in intramural or nonvarsity sports” (National Center for Education Statistics, 2002, Electronic Codebook, CMINTRAM)? The academic integration variables measure study group participation (77.4% report that they did participate in a study group); social contact with faculty (54.9% report having had this contact); having met with an advisor (88.7% report this activity); and having talked with a faculty member outside of class about academic matters (85.6% reporting a positive response). This researcher was concerned that the components of the academic integration index were so closely related that the student respondents would not be able to distinguish between them and the concepts that each represents. The VIF test indicated that there was no indication of multicollinearity; therefore, the VIF Test results seem to indicate that the questions are worded clearly enough and that the respondents understand the differences between the variables and the concepts that they represent. The final academic

experience factor is satisfaction with instructors' ability; 90.7% of the respondents indicated that they were satisfied with the instructors ability overall.

The financial aid variables were added to this study as control variables. These continuous variables were transformed to z-scores to facilitate the use of logistic regression and provide more detail than a series of dummy-coded variables would. The mean Pell Grant award in 1996 was \$258.18 with a standard deviation of \$550.56. The mean loan amount for the sample population was \$2,382.32 with a standard deviation of \$3,391.22. The mean work study award was \$245.26 with a standard deviation of \$582.95, and the mean merit award was \$719.48 with a standard deviation of \$2,020.09

Descriptive statistics can provide a window on the relationships between the variables. The variables can be examined through the lens of persistence which is very important for this study. Crosstabs were run for the categorical variables and persistence; the adjusted weight was applied to the sample before the crosstabs were executed. Overall, 78.2% of the sample population persisted. There are no surprises in these data with regard to the direction of the associations as predicted by the literature; however, some of the percentage figures belie greater magnitude than expected for the academic variables and higher rates of completion overall than are found in many persistence studies. This is likely due to the pre-filtering of the population for attending a 4-year

Table 10

Descriptive Statistics for the Sample Population Continuous Variables Prior to Standardization

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
TESATDER	4149	430	1550	924.21	208.482
SEGPAY1	4149	0	400	269.06	87.594
SOCINT	4149	100	300	177.05	42.271
PELL96	4149	0	2340	246.15	551.389
TOTLOAN2	4149	0	33625	1832.77	2961.592
TOTWKST	4149	0	5800	194.18	549.277
MERITAD	4149	0	20702	576.11	1735.385
Valid N (listwise)	4149				

institution and the bachelor's degree goal that the respondents reported. The inferential statistics will verify the associations and identify whether the associations are distinct for the students who delay based on the comparison of the two regression equations for the distinct populations.

Specifically for the focal variables from high school, 77.1% of those who took Algebra 2 or a higher level of math persisted in college whereas only 61.5% of those who did not reach this threshold for math were persistent in college. Eighty-seven and seven tenths percent of those students who earned A's on average in high school were persistent, whereas this was true for only 74.2% and 60.3% of the students who earned B's on average or C's and below, respectively. Figure 2 is a graph which depicts that persistence and standardized test scores are associated.

Table 11

Crosstabs of Selected Categorical Variables and Persistence

n=4164		
	% Yes	% No
PERSISTENCE	78.2	21.8
DEMOGRAPHICS		
Race: White/Asian	77.3	22.7
Race: Other	67.9	32.1
Gender: Female	77.8	22.2
Male	72.9	27.1
Income: Top 25%	83.3	16.7
Middle 50%	75.9	24.1
Bottom 25%	65.5	34.5
1stGen: Yes	65.9	34.1
No	79.5	20.5
Delay: Yes	65.1	34.9
No	77.3	22.7
HIGH SCHOOL ACADEMICS		
Algebra 2 or Higher	77.1	22.9
Below Algebra 2	61.5	38.5
High School GPA: A's	87.7	12.3
B's	74.2	25.8
All else	60.3	39.7
INSTITUTION		
Selective	90.4	9.6
Not Selective	73.9	26.1
Public	73.7	26.3
Private	80.3	19.7
COLLEGE ACADEMICS		
20 or More Credit Hours 1st Year	79.4	20.6
Less than 20 Hours Earned 1st Year	50.5	49.5
Participated in Study Group	78.1	21.9
No Study Group	68.9	31.1

	% Yes	% No
No Social Contact w/ Faculty	74.7	25.3
Met with an Advisor	76.7	23.3
Did Not Meet w/ Advisor	69.5	31.5
Talked w/ Faculty	76.1	23.9
Did Not Speak w/ Faculty	72.6	27.4
Satisfied w/ Instructor's Ability	75.6	24.4
Not Satisfied	75.3	24.7

The crosstabs of persistence and college experience academic variables also indicate associations. Of those students who met the 20 credit threshold, 79.4% of them persisted, whereas only 50.5% of those who completed fewer than 20 credits persisted. Measures of climate are used to indicate the academic integration of a student. Of those who participated in a study group, 78.1% persisted as compared with 68.9% of those students who reported no study group activity. Social contact with faculty seems to have little salience at all with regard to persistence (76.3% of those reporting positive responses persisted and 74.7% of those who reported no social contact with faculty persisted). Of those who reported meeting with an advisor, 76.7% persisted as compared with just 69.5% of those who did not meet with an advisor. 76.1% of the students who reported talking with faculty about academic matters outside of class persisted, whereas 72.6% of those who did not report doing so persisted. With regard to satisfaction with the ability of the instructor, 75.6% of those who persisted reported being satisfied, where 75.3% of those who did not persist, were not satisfied.

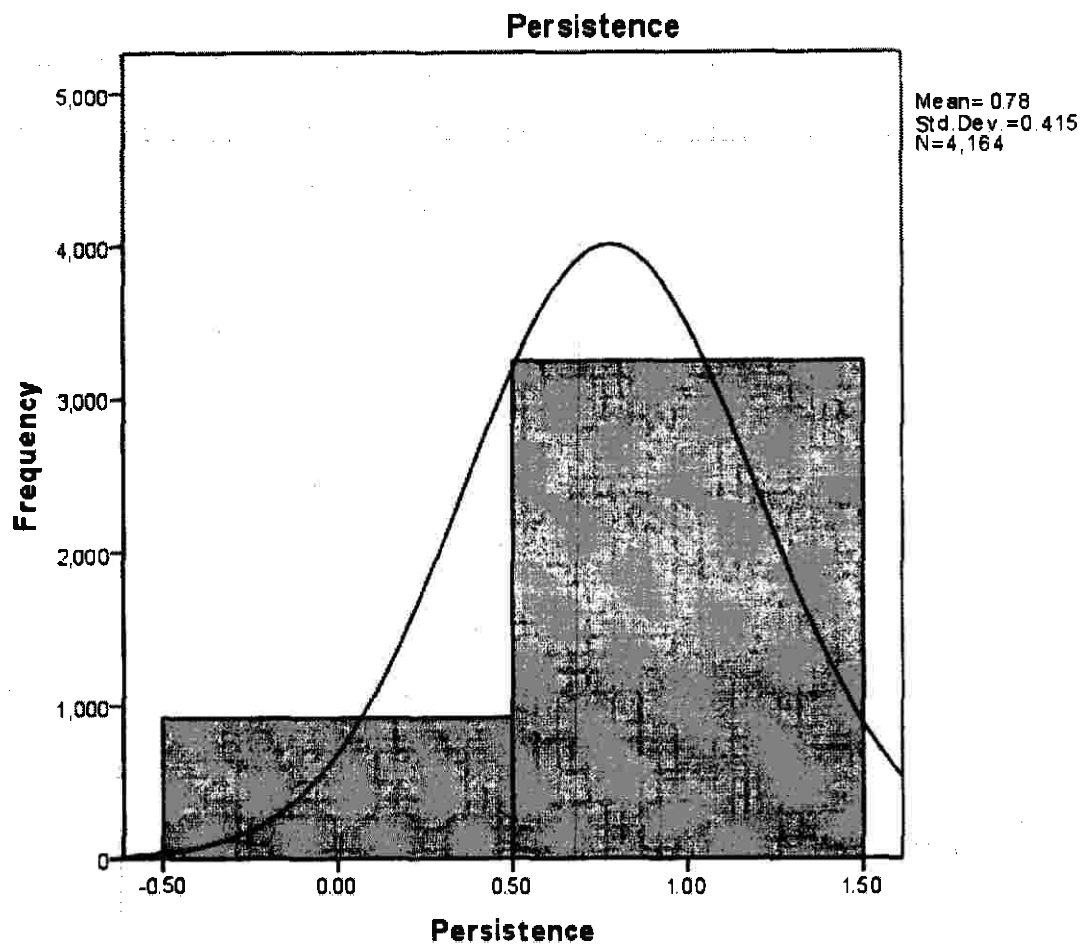


Figure 2 - Crosstabs for Persistence and Standardized Test Score

The inferential statistical technique to be used for this research study will be to run binary logistic regressions for the students who delay separately from traditional students. In order to get a sense of this specialized sub-population, crosstabs will be examined.

Table 12 demonstrates the distinctions between the subpopulations. The focus of the study is delaying students, so the table will be reported through this lens.

Table 12

Crosstabs of Selected Variables with Delay

n=4164		
	% Yes	% No
DELAY	6.3	93.7
PERSIST	65.1	77.3
Not Persist	34.9	22.7
DEMOGRAPHICS		
Race: White/Asian	19.4	80.6
Race: Other	18.1	81.9
Gender: Female	12.8	87.2
Male	15.5	84.5
Income: Top 25%	18.1	29
Middle 50%	51.3	53.7
Bottom 25%	30.6	17.3
1st Gen: Yes	15	85
No	13.6	86.4
HIGH SCHOOL ACADEMICS		
Algebra 2 or Higher	13.1	21.8
Below Algebra 2	86.9	78.2
High School GPA: A's	26.7	39.3
B's	41.8	36.4
All else	31.5	26
INSTITUTION		
Selective	12	14.8
Not Selective	88	85.2
Public	86.6	85.7
Private	13.4	14.3
COLLEGE ACADEMICS		
20 or More Credit Hours 1st Year	11.9	28.2
Less than 20 Hours Earned 1st Year	88.1	71.8
Participated in Study Group	76.2	71.6
No Study Group	23.8	28.4
Social Contact w/ Faculty	50.8	53.7
No Social Contact w/ Faculty	49.2	46.3

	% Yes	% No
Met with an Advisor	81.9	86.4
Did Not Meet w/ Advisor	18.1	13.6
Talked w/ Faculty	85.9	84.6
Did Not Speak w/ Faculty	14.1	15.4
Satisfied w/ Instructor's Ability	84.9	91.1
Not Satisfied	15.1	8.9

Table 12 seems to indicate some important differences with regard to the focal variables for the students who delay as compared with their traditional peers. These students are less prepared academically for the rigors of college. Students who delay were almost half as likely to have not taken Algebra 2 (13.1% compared with 21.8%), whereas the traditional students were more likely to have taken Algebra 2. Although the percentage of students who report a B average in high school is similar for students who delay and those who do not, the percentage of delaying students who report A's is 26.7% as compared with traditional students (39.3%). Delaying students report C averages 31.5% of the time and traditional students report C averages in high school 26% of the time.

With regard to college academic experiences, delaying students are close to 3 times more likely than their traditional counterparts to have not reached the 20 credit threshold (11.9% to 28.02%). They are more likely to have participated in a study group (76.2% compared with 71.6%). Delayers were more likely to have talked with faculty about academic matters outside of class (85.9 as opposed to 84.6%), and less likely to have met with an advisor (81.9% compared with 86.4% for traditional students). The

measure of social interaction with faculty indicates that students who delay report similar levels of social contact with faculty (50.8% as compared with 53.7%). Interestingly, delayers report high levels of dissatisfaction with instruction (15.1% as compared with 8.9%). Delayers are almost twice as likely to be from low income backgrounds (30.6% as compared with 17.4%). This has important implications for the population as previous studies have noted an association between low income and attrition (Choy, 2000; McPherson & Schapiro, 1999).

Figure 3 shows the distinction between the traditional students and the delayers with regard to test score. The delayers are distinct in ways that are likely to indirectly impact academics and social integration.

Inferential Statistics

This study is focused on the academics of students both in high school and in college and the impact of these factors on the persistence of students who delay college entry. The academics of interest are preparation and faculty interaction. The momentum construct- which defines preparation for college work in a manner first identified by Adelman (1999), based on the work of Alexander (Alexander & Eckland, 1977; Alexander & Pallas, 1984; Alexander, et al., 1982; Thomas, et al., 1979) is identified in the high school academic variables- GPA, Test score and highest level of math taken.

The follow-up study by Adelman (2006) also identified academic variables in

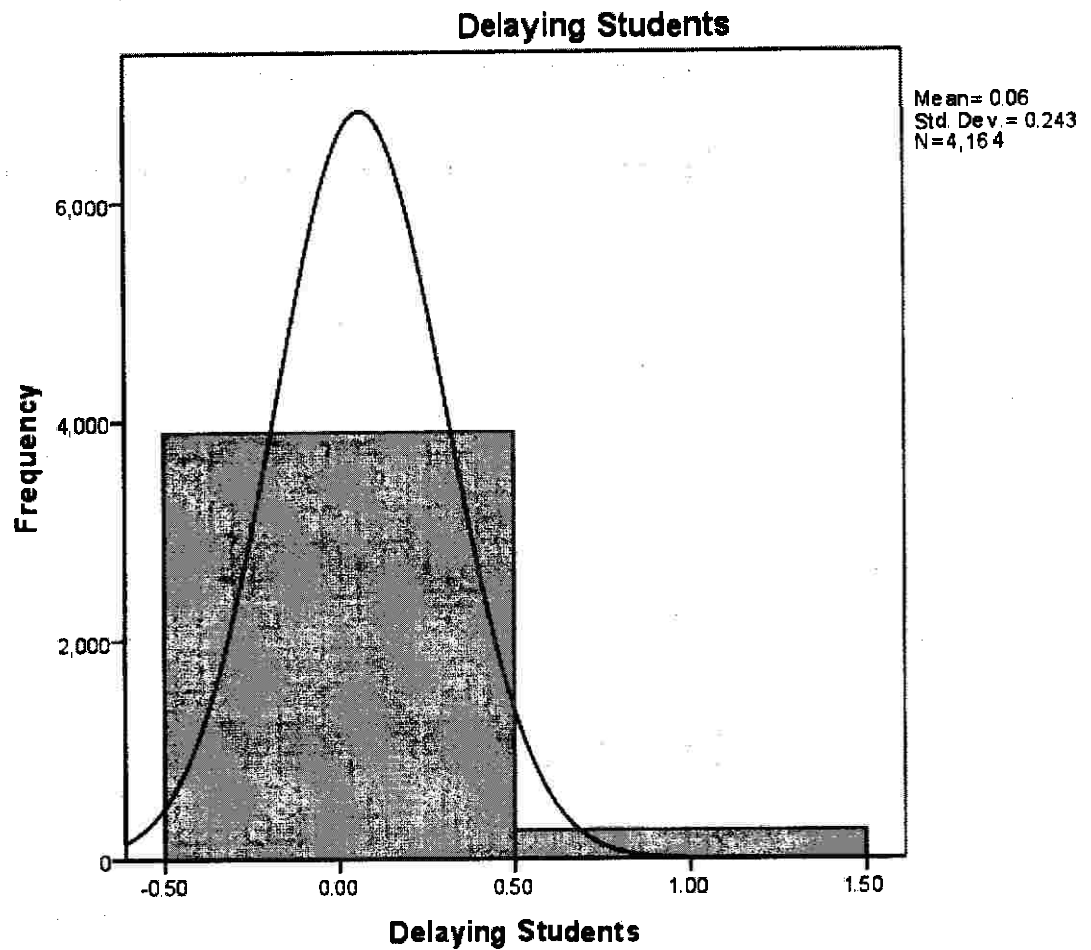


Figure 3 -Traditional v. Delaying Students and Test Score

college which are a continuation of the academic momentum construct. Not all of these variables were available for the present study.

The logistic regression provides us with the odds ratio which demonstrates the odds of a student's persistence given the effects of the independent variables. These are more intuitive as Chen (2007) explains in her dissertation which examines the effects of financial aid on attrition.

Compared with logit coefficients, odds ratios, which are the exponential of coefficients are easier to interpret. For example, the odds ratio of the independent variables represents the ratio of the probability of dropout to the probability of non-dropout (persisting or graduating). Since the odds ratio is a multiplicative coefficient, positive effects have odds ratio greater than one, while negative effects have odds ratio between 0 and 1. (p. 104)

The binary logistic regression was run with the predictor variables for the two subpopulations individually so that the results could be compared in order to test the hypotheses that students who delay experience the association between persistence and academic variables in a distinct manner from that experienced by their traditional peers. The regressions will be examined separately and then together in an effort to identify critical factors for both traditional and delaying students and to determine if these patterns of association are distinct.

Traditional student logistic regression analysis. The regression was run first for the traditional students. Of the 4164 students in the final sample for study, 3901 students, or 93.6% of the sample population, were considered in this regression equation (see Table 13). The empty model (no predictors employed) successfully predicted 77.3% of the outcomes successfully. With the predictor variables added, just over 1% more of the outcomes are successfully predicted, 79.1%. The focal variables are divided chronologically and appear in the logistic regression output similarly. Demographic

variables were examined as control variables. Neither Race nor Gender was statistically significant ($p=.089$ and $p=.199$, respectively), but First Generation College Students (a variable representing that neither parent had some postsecondary experience) was significant ($p<.001$) and was negatively associated with persistence for the traditional students. In other words, students whose parents had not attended college at all had just 56% of the odds of persisting as compared with students whose parents had such experience. Low and middle income were found to be both significant and negatively associated with persistence. The variable representing students from the lowest quartile of income (calculated separately for dependent and independent students) was significant ($p<.001$) and strongly negatively associated with persistence. The odds of students from the traditional lowest quartile persisting was just 39.5% of the odds of their more affluent peers persisting. Similarly, the odds of traditional middle income students persisting was found to be 63.6% of the odds of other students persisting ($p<.001$). This indicates a great advantage for traditional students from the highest income quartile.

The variables that represent high school academic preparation for college which are hypothesized to be salient with regard to persistence represent high school grades, standardized test scores, and the highest level of math taken. Adelman found high school math to be salient with regard to persistence, but the present study found it to not be significant ($p=.151$) for the traditional students. High school grades as reported by the student to the testing services during a standardized test, especially for students who

report having mostly A's, were found to be significant ($p < .001$) and a more powerful predictor of persistence in that those traditional students reporting A's in high school were close to two times more likely than other high school students to persist in college (odds ratio=1.955). Traditional B average students demonstrated a significant ($p < .05$) and positive association with persistence, but were only 1.289 times more likely to persist than other students. Test score was not found to be significant ($p = .241$) for the traditional students.

Of the college academic variables identified in this study, the one that demonstrates the most powerful association with persistence represents the grade point average reported for the first year. This variable was significant ($p < .001$) and positively associated with persistence for traditional students. Each one standard deviation increase in GPA for the traditional student represents a 1.768 times greater likelihood of persistence. The achievement of a credit threshold identified as powerful in the *Toolbox Studies*, earning 20 or more credits, is significantly ($p < .01$) and positively associated with persistence. Traditional students who achieve this milestone during the first year are 158% more likely to persist than their less productive counterparts. Control variables for institutional context had mixed results. Selectivity was significant ($p < .05$) and positively associated with persistence for the traditional students. Traditional students who attended a selective institution increased their odds of persisting by 1.64 times that of their peers who attended less selective institutions. The variable representing attending a public

institution did not attain significance in the equation for traditional students ($p=.694$). All 4 of the control variables representing means of financing an education were found to be significant, representing receipt of various types of financial aid during the first year of study. The Pell Grant variable was significant ($p<.01$) and positive, representing an incremental improvement of 1.187 in the odds of persistence for each standard deviation increase in Pell Grant support. The First Year Loan variable was found to be significant ($p<.05$) and negatively associated with persistence. For each standard deviation increase in loans, traditional students who took out loans during their freshman year were found to have 88.2% of the odds of persisting. Work Study was significant ($p<.001$) and is associated with improved odds of persistence of 1.29 for each standard deviation increase in work study aid for the traditional students. Merit aid was found to be significant ($p<.05$), and positively associated with persistence. For the traditional student, every standard deviation increase in merit aid, the odds of persisting were increased by a factor of 1.204.

Delaying students regression analysis. The addition of the specified variables to the model for students who delay increases the ability of the model to predict from 65% of the persistent students to 74.5% of the event of persistence (see Table 14).

The logistic regression generated interesting results for the demographic control variables for the delaying subpopulation. Race was significant for the delayers ($p<.05$) and negatively associated with persistence. White and Asian students had decreased odds

of persistence if they delayed college entry by 44.8% of the odds of students from other racial/ ethnic groups. Gender was not significant ($p=.114$). The first generation college variable is significant ($p<.05$) and negatively related to persistence, where the odds of persisting for students whose parents never attended college were just 51% of those whose parents had attended college at all. This supports the findings of previous studies (Carter, 2001; Choy, Horn, Nunez, & Xianglei, 2000; Corrigan, 2003). Only middle income was significant ($p<.01$ where low income was not, $p=.728$). This variable, representing delaying students who come from the middle two quartiles of income was positively associated with persistence; the odds ratio indicates that delaying students from the middle income are 2.67 times more likely to persist.

The variables that represent high school academic preparation for college which are hypothesized to be salient with regard to persistence represent high school grades, standardized test scores, and the highest level of math taken. Adelman found high school math to be salient with regard to persistence, but the present study did not find it to be a significant predictor for persistence with the sample subpopulation of delaying students ($p=.554$). B grades were found to be significant ($p<.01$) and positive; in particular, having a B-average in high school for the delayers represented a increase in the odds ratio by a factor of 2.08, but the results for A-average students who delayed college were not significant ($p=.149$).

Table 13

Logistic Regression Results for Traditional Students

Variable	B	S.E.	Exp(B)	Sig.
White or Asian	.198	.117	1.219	
Males	-.119	.092	.888	
First Generation	-.580	.098	.560	***
Low Income	-.929	.169	.395	***
Mid Income	-.453	.115	.636	***
Algebra2 or more	.210	.146	1.234	
As in High School	.670	.137	1.955	***
Bs in High School	.254	.105	1.289	*
Standardized Test Score	.073	.062	1.076	
Selective Institution	.473	.222	1.604	*
Public Institution	.047	.120	1.048	
Standardized 1 st Yr GPA	.570	.049	1.768	***
Twenty or More Credits 1 st Yr	.455	.137	1.577	**
Standardized Social Integration Index	.079	.050	1.082	
Study Group	.167	.104	1.182	
Social Contact w/ Faculty	-.181	.095	.835	
Meet w/ Advisor	.184	.131	1.202	
Talk w/ Faculty Outside of Class	-.377	.131	.686	**
Satisfied with Teaching Ability	-.187	.154	.829	
Standardized Pell Amount 1 st Yr	.171	.061	1.187	**
Standardized Loan Amount 1 st Yr	-.125	.053	.882	*
Standardized Work Study 1 st Yr	.257	.065	1.293	***
Standardized Merit Aid 1 st Yr	.186	.081	1.204	*
Constant	1.300	.310	3.671	***

*** p < .001, ** p < .01, * p < .05

Standardized test scores were not significant for this subpopulation, either ($p=.773$). Variables representing institutional context for the college attended, selectivity and control, are not significant.

College experience academic factors were also associated with persistence for the delaying students. First year grade point average was significant ($p<.001$) and positively associated with persistence. For each standard deviation increase in grade point average for the first year, the likelihood of persistence increased by a factor of 1.64. The credit threshold that Adelman found so salient with regard to persistence was confirmed with the results of this study, at least for the subpopulation of students who delay. This variable was significant ($p<.001$) and positively associated with degree completion for the delayers. In fact, the odds ratio demonstrate that achieving 20 credits in the first year increases a student's odds of persistence by more than 500% (odds ratio= 5.152). The variable representing the standardized score for the social integration composite variable was significant and positively associated with persistence. For each standard deviation increase in the social integration index composite score, the likelihood of persistence increased by a factor of 1.25. This finding was a surprise, as this variable was added to balance the use of the academic integration component variables which are of specific interest in this study. The literature on tells us that non-traditional students are less likely to be socially integrated (Bean & Metzner, 1985). Another important finding about students who delay is that participating in a study group is salient. This was found to be

significant ($p < .05$) and positively associated with persistence for delaying students. A delaying student who reported participating at any level in study groups in the freshman year, was twice as likely to persist (odds ratio=2.0). Other components of the academic integration index, having social contact with faculty, meeting with an advisor and talking with a faculty member outside of class were not found to be significant ($p = .788$, $p = .811$ and $p = .701$, respectively). Interestingly, satisfaction with teaching ability was found to be significant, but negatively associated with persistence. Delaying students who reported being satisfied with the instructor's ability were less than half as likely to persist (odds ratio=.486) as their less satisfied peers. This seems to be a contradictory finding to that of research on adult students, but is not necessarily so. Aslanian and Brickell (1988) report that adult students identify teaching ability as important to them, but did not connect this to persistence. Students who are critical may be demonstrating a confidence with their abilities and a maturity that is consistent with persistence (Bean & Eaton, 2000). Not one of the control variables for financial aid was significant in the equation for students who delay.

Overall results for the focal variables in the models. Overall, the model for the delaying subpopulation predicts better than the model for the traditional students; the addition of

Table 14
Logistic Regression Results for the Delaying Subpopulation

Variable	B	S.E.	Exp(B)	Sig.
White or Asian	-.802	.310	.448	*
Males	-.342	.217	.710	
First Generation	-.673	.286	.510	*
Low Income	.138	.396	1.148	
Mid Income	.983	.327	2.672	**
Algebra2 or more	-.198	.335	.820	
As in High School	.496	.344	1.642	
Bs in High School	.733	.267	2.080	**
Standardized Test Score	.043	.150	1.044	
Selective Institution	.553	.465	1.739	
Public Institution	.435	.261	1.546	
Standardized 1 st Yr GPA	.494	.130	1.639	***
Twenty or More Credits 1 st Yr	1.639	.278	5.152	***
Standardized Social Integration Index	.220	.105	1.246	*
Study Group	.696	.285	2.005	*
Social Contact w/ Faculty	-.238	.224	.788	
Meet w/ Advisor	-.209	.310	.811	
Talk w/ Faculty Outside of Class	-.355	.342	.701	
Satisfied with Teaching Ability	-.722	.361	.486	*
Standardized Pell Amount 1 st Yr	.137	.114	1.146	
Standardized Loan Amount 1 st Yr	.034	.170	1.034	
Standardized Work Study 1 st Yr	-.063	.094	.939	
Standardized Merit Aid 1 st Yr	-.236	.255	.790	
Constant	16	.704	1.123	

*** p< .001, **p< .01, *p<.05

the specified variables increases the ability of the model to predict from 65% of the persistent students to 74.5% of the event of persistence. For the traditional student,

achieving mostly A grades in high school is the most powerful academic predictor of persistence (see Table 15). For the delaying student, a B average was predictive of persistence, and although this was significant at a lower level, it is a bit more powerful than the A averages are for the traditional students. Hypothesis 1 proposes that precollege academic factors which positively influence persistence are distinct for the two subpopulations under study. This was not supported by the statistical evidence. The very slight distinction that A average grades are salient for traditional students where B average grades are salient for students who delay is likely the result of the small sample of delaying students and the even smaller sample of those students who earned an A average.

First year GPA and the 20 credit threshold were salient for both subpopulations. The first year of study lays an important foundation for confidence, and students who are successful at this time are likely to persist regardless of whether they took a break between high school and college or not. The grade point average represents academic achievement which builds confidence and would not be possible if the student is not mature enough to handle the academic rigors of college and make the adjustments to a new set of academic conventions. The 20 credit threshold is important for all students as well. This has policy implications associated with it for institutions as well as public policy as it is inextricably intertwined with financial aid.

Table 15

Comparison of the Two Regression Equations

	DELAY				TRADS	
	B	S.E.	Exp(B)	Sig.	Exp(B)	Sig.
White or Asian	-.802	.310	.448	*	1.219	
Males	-.342	.217	.710		.888	
First Generation	-.673	.286	.510	*	.560	***
Low Income	.138	.396	1.148		.395	***
Mid Income	.983	.327	2.672	**	.636	***
Algebra2 or more	-.198	.335	.820		1.234	
As in High School	.496	.344	1.642		1.955	***
Bs in High School	.733	.267	2.080	**	1.289	*
Standardized Test Score	.043	.150	1.044		1.076	
Selective Institution	.553	.465	1.739		1.604	*
Public Institution	.435	.261	1.546		1.048	
Standardized 1 st Yr GPA	.494	.130	1.639	***	1.768	***
Twenty or More Credits 1 st Yr	1.639	.278	5.152	***	1.577	**
Standardized Social Integration Index	.220	.105	1.246	*	1.082	
Study Group	.696	.285	2.005	*	1.182	
Social Contact w/ Faculty	-.238	.224	.788		.835	
Meet w/ Advisor	-.209	.310	.811		1.202	
Talk w/ Faculty Outside of Class	-.355	.342	.701		.686	**
Satisfied with Teaching Ability	-.722	.361	.486	*	.829	
Standardized Pell Amount 1 st Yr	.137	.114	1.146		1.187	**
Standardized Loan Amount 1 st Yr	.034	.170	1.034		.882	*
Standardized Work Study 1 st Yr	-.063	.094	.939		1.293	***
Standardized Merit Aid 1 st Yr	-.236	.255	.790		1.204	*
Constant	.116	.704	1.123		3.671	***

*** p < .001, ** p < .01, * < .05

The academic integration variables were examined in order to assess the salience of different types of academic interactions. The finding of the importance of study groups for just the delaying students supports the hypothesis that students who delay college attendance have distinct success factors, or academic variables are associated with persistence in a distinct manner for delaying students as opposed to traditional students. The finding of negative, significant association for satisfaction with teaching ability and degree attainment for the delaying students and not for traditional students also supports hypothesis 2.

CHAPTER V

CONCLUSION AND IMPLICATIONS

In conclusion, this study was able to identify a few academic factors that affect persistence for both subpopulations of students. These factors include grades in high school and college. The lack of standardization of grading and curricula in combination with a realistic fear of grade inflation has influenced many academic discussions. Perhaps positive grades serve an important psychological purpose of reinforcing behaviors and building confidence.

The 20 credit threshold is essentially a representation of full time attendance status. In order for students in most institutions to earn this many credits in a year, they must attend full time for at least one term in that year. Students who do so demonstrate more persistence in both subpopulations.

One factor that differentiates the persistence of delaying students versus their traditional peers is the finding that study groups have so much import for the students who delay. This will be more fully explored in the Implications for Practice section to follow. Another factor found to be salient is the satisfaction with teaching ability, but negatively so.

The literature about non-traditional students clearly demonstrates that they are different from traditional students in terms of life experiences, resource allocation, and responsibilities with regard to other persons and not just themselves. The purpose of this

paper was to determine if these students were also distinct with regard to academics, specifically academic preparation and academic experience factors relating to interactions and the faculty. There is little research about how academic factors before and during college are associated with persistence for this growing population. Academically, the academy treats all students the same, and if populations of students are indeed different, this should be reconsidered.

Studies have just begun to identify the academic differences in the populations. Aslanian and Brickell (1988), for instance, found that teaching ability was very important to adult students. The finding in this paper that students who delay have a negative association between satisfaction of teaching ability and persistence is not a reflection of the teaching ability of their faculty, nor should it be interpreted as these students being likely to be more successful after having encountered particularly poor pedagogical practices. Instead, these students are more likely to be critical and demanding educational consumers. They have determined to spend their limited resources of time, attention and money on education, and are not going to demand the best education that they can get in return for those resources.

Seidman (2005) noted that as non-traditional students were less likely to be socially integrated, academic integration via learning communities would be an ideal way to engage these students and to encourage and support their educational commitments. The results of this paper suggest that this is indeed the case. Learning communities can

take many forms; study groups represent the evident value of these communities for students. These groups represent peer support, which this study identifies as being more directly associated with success for delaying students than does faculty interaction, however, the faculty can design lessons, projects and discussion groups with the intent of inspiring support of this nature.

Persistence research has, at its roots, the idea of helping more students to graduate specifically, and, in general, fostering more positive student outcomes. This research has focused on non-traditional students. As this population of students continues to grow, it is of vital importance to better understand what factors help non-traditional students to be more persistent. This research was specifically designed to determine if the academic variables related to success are distinct for the student who delays as compared with traditional students. This information can help policy makers and practitioners foster increased success as a result of better understanding this population of students. Policy makers must be able to understand the unique set of barriers that delaying students face with regard to persistence. Practitioners who are better informed about delaying students who persist can design programs to help to eliminate or alleviate the barriers to persistence that are characteristic of the delaying student experience.

Implications for Policy

Several factors have been identified in this study for their positive association with persistence for all students. Grades are seemingly more important than just a

recording of marks which identify a teacher's assessment of effort and intellect. In both the secondary and post secondary environments, policies designed to enhance and improve grades must be clearly communicated and evenly applied. Many institutions have a policy with regard to Dean's List status as well as probations and suspensions. These policies are tied to grade point average and should be designed to foster engagement. Too often, these guidelines are applied unevenly or even capriciously. More importantly, the consequences and attributions associated with these grading policies must be better communicated to all students.

Grades can sometimes play a role in the withholding of financial aid. If financial aid policies can positively influence grades with better design and communication, students and institutions will benefit.

Many of the researchers who study adult learners focus on the negative impact of financial aid policies designed for traditional students (Longanecker & Blanco, 2003). They argue that these policies are unfair to adult students and create barriers for them that are sometimes insurmountable. Other researchers have noted that changes to policies in some institutions have improved persistence rates of non-traditional students at certain institutions as reported as best practices (Hart, 2003). The finding here of the importance of the 20 credit threshold may demand a closer look at financial aid policies and how to improve them for adult students. Perhaps full time status as an eligibility

requirement for aid is beneficial as it encourages students to become more fully engaged in attending college.

The finding here that study groups are a positive factor for students who delay has ramifications for institutional policies. From what research tells us about non-traditional students, we know that their most valuable resource is time. Study groups must be designed to make the maximum level of impact with a minimum requirement of time, or participation at the convenience of the student; perhaps a virtual group that is asynchronous. The research notes that learning communities can be found that are alternate versions of the "honors house" and can be tailored to the needs of the community that they serve (Tinto, 1997). Braxton and his colleagues (2004) specifically highlight the importance of designing effective learning communities and study groups for non-traditional students and in commuter institutions that are less structured. Institutional research about the benefits of these groups or communities can aid institutions in designing effective practices which can support more students (including non-traditional students) to persistence. This knowledge will aid institutions in supporting those programs more likely to foster persistence.

As the populations that attend college grow increasingly diverse, we must focus on how these disparate populations become engaged and involved in a manner that will help them to earn their own persistence. Many researchers are specific about the importance of using the information we glean from best practices to develop institutional

responses that will enhance the persistence of all students. "Governing boards should learn what their institutions must do to promote student persistence and look for leaders who have concrete ideas for mobilizing faculty and staff members" (Kuh, 2008a, p. A72). Institutional support of policies designed to enhance persistence must include training, rewards and reporting. Reporting is of vital importance for improving the management of persistence policies and for keeping these policies at the forefront of the institutional agenda.

Implications for Practice

Too often in both the secondary and postsecondary environments students are pushed through a class with a C or a D grade and are not required to master the material. Letter grades no longer represent the Excellent, Above Average and Average (A, B and C respectively) that they once did. We have become a nation of students who all hail from Garrison Keillor's (1986) Lake Wobegon; where all of the children are above average. For many students grades represent a validation that they can succeed in the role of a student; too often grades become important when they are received and it is too late for students to make a difference. Chickering and Gamson (1987) recommend that feedback about student performance be prompt and that high expectations be communicated. Cox (2009) writes about the lack of understanding between the faculty and the students, and the effects of this on confidence and continued attendance. Posted rubrics and clear communication about the requirements to earn distinct levels of grades will encourage

students to become invested in their grades when they can make a difference in what they will earn. This will encourage confidence and maturity as students will become partners in the education process. This is the next logical step to enhancing education for today's learners. The teacher will be the guide on the side for the assessment portion which is so critical to the learning process.

Because of the Yellow Ribbon Program (U.S. Department of Veteran's Affairs, 2006), non-traditional students who served in the military are being sought by institutions. These students are delayers as they have already performed their military service and the program represents a part of their compensation.²⁶ These students represent an income stream which is substantially subsidized by the government, but will likely encounter barriers to persistence unique to their circumstances. Faculty members have the ability to change the structure of education in their class. Support networks, study groups and learning communities of all forms are now possible with advances in technology associated with pedagogy and andragogy. A great teacher can create a sense of community around any course with the correct assignments and co-curricular connections. "Small communities develop around the college classroom, a community for each course. Such communities develop, however, only if faculty members actively involve students in the process of learning" (Braxton, et al., 2004, p. 48).

²⁶ In some instances, dependents of those who have served are eligible for this benefit.

In order for best practices to become the norm, institutions must better communicate, and innovation in the classroom must be supported by a restructuring of the institution's reward system.

Further Research

National datasets are a tremendous tool for research and must continue to be supported. Adelman (2006) recognized the limitations of his work: "what is associated with degree completion in one generation may not be associated with it in the next, or that the strength of association may change" (p. 16). This is particularly true in a time of significant change in the background of the average student in U.S. higher education. As students change in the aggregate, in combination with societal changes, it will be ever more important for the institution to keep up with changing demands. In fact, the time periods between the cohorts for these important national datasets may have to be shortened so that they can overlap if students continue to change as rapidly as they are changing today.

Time to degree, especially for non-traditional students is longer in many instances than the cohort period is for many of the national datasets. This, in combination with a dearth of information about non-traditional students, demands a new dataset be created to measure the college experience for non-traditional students, or a restructuring of a current dataset to be more inclusive of all students. As time to degree continues to increase for all cohorts, especially those who do not follow what is considered to be the traditional

route, the national datasets must keep pace with this trend and increase the length of their longitudinal studies. For students who are less likely to be enrolled full time continuously, a 6 year study period is inadequate. Adelman's construct of momentum and associated variables, in particular the number of completed credits, is designed for full-time students. This is not an appropriate metric for the non-traditional student population and should be reconsidered.

Delimitations

The limits of the researcher and time constraints forced compromises to be made in the execution of this research project. The listwise deletion of cases in order to clean up the data for analyses may have caused the before and after data to be distinct which would limit the generalizability with regard to the population of college students in the US that NCES designed it to represent. The variables with the greatest number of cells missing information are those which represent the focal variables in this study. In order for the results of this study to apply to the population of college students in the US as NCES designed BPS to do, the new and the old population must be similar enough to be representative. An analysis of the data using independent sample T-tests of both the sample population before and after the cases with missing variables have been deleted would aid in determining the distinctions between the two populations.

The newest administration of the BPS (BPS:04/09) is currently under study and the implications of this cohort, and the trends that it demonstrates, should further refine

the way we can best study those students who are changing the academy. Rerunning the statistics with the newer version of the dataset when it is available would give the research community the most current information about students.

The subpopulation studied here is very small. A test of interaction effects would enhance the rigor of this study. Just one regression would be run and then the interaction effects of the variable delay with the focal variables would be examined to determine the true effects of the focal variables for the students who delay. Chen and DesJardins (2008) suggest using interaction terms and argue that comparing separate regressions of the delaying student cohort with the traditional cohort of students is flawed as comparing the significance of distinct regressions is fraught with nuance which cannot be easily understood. They cite Jaccard (2001) as evidence of their logic:

For example, it is entirely possible for the coefficient in one group to have a p value of 0.051 associated with it and the coefficient for the other group to have a p value of 0.049. Even though one is statistically significant and the other is not, the coefficients are almost certain to be comparable in magnitude with trivial differences between them. Formal interaction analysis through product terms in a single equation is preferable because it provides a means of formally testing the differences between coefficients. (p. 17)

The logistic regression would be run both with (“unrestricted” model) and without (“restricted” model) the interaction effects in order to analyze which model fits the

sample data best. “Interaction means that the effect of one independent variable differs according to the level of another independent variable” (Foster, et al., 2006, p. 62). This would enable the researcher to determine if the hypothesis applies in all instances, that is, that students who delay have distinct relationships between academics and persistence as compared to their traditional peers.

An interaction in the predictors demonstrates that the two variables have a multiple effect: that is, having one variable is not necessarily highly predictive of outcome but when this variable co-exists in the presence of another, the second variable “intensifies” the predictive value of the variables. (Foster, et al., 2006, p. 68)

Future Study

The next logical step to this research stream would be to perform a qualitative study with students from one institution or a few institutions in the same region which have a diverse student body in terms of delayed entry. More specific information about the benefits of study groups or learning communities will enable new programs to be better designed from inception. Trial and error takes time and wastes valuable resources; a thorough understanding of how to better support students in and out of the classroom is vital to enhancing persistence for these students.

The finding of satisfaction with instruction being negatively associated with persistence for the delaying population is confounding as it seems to be unexplained.

The recommendation here would be to better explore this finding with a qualitative study which should be designed with the lens of psychological theory in mind.

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Appendix A- Glossary

Attrition- refers to students who fail to enroll at an institution in consecutive semesters.

CADE- Computer assisted data entry notation for one source of information for BPS: 96-01. The information is found in institutional databases and then entered by institutional personnel or field collectors.

CATI- Computer assisted telephone interview notation for the parent and student interviews for BPS: 96-01.²⁷

Cohort- “Persistence measurement begins with the careful identification of a clearly defined group or cohort of students at one point in time and place with specific demographic and enrollment characteristics.” (Mortenson, 2005, p. 33)

Denominator- “The identification of a cohort of a certain number of students in time and place with specific demographic and enrollment characteristics fixes the rate of whatever is being studied.” (Mortenson, 2005, p. 33)

Dismissal- refers to a student who is not permitted by the institution to continue enrollment.

Dropout- refers to a student whose initial educational goal was to complete at least a bachelor’s degree but who did not complete it.

Integrated Postsecondary Education Data System (IPEDS)- One source of data for BPS:96-01 used for institutional characteristics. “U.S. Department of Education data base of descriptive information about individual postsecondary institutions.” (National Center for Education Statistics, 2002, BPS Codebook, DATASCR)

Mortality- refers to the failure of students to remain in college until graduation.

National Student Loan Data System (NSLDS)- One of the sources of information regarding student loans used by the BPS: 96-01.

Nonpersister- “A student who leaves the college without earning a degree and never returns is a nonpersister.” (Hagedorn, 2005, p. 89)

Persistence- refers to the desire and action of a student to stay within the system of higher education from beginning year through degree completion.

²⁷ Only 15 percent of parents responded per the restricted file BPS Codebook

Persister- "A student who enrolls in college and remains enrolled until degree completion is a persister." (Hagedorn, 2005, p. 89)

Retention- refers to the ability of an institution to retain a student from admission to the university through graduation.

Stopout- refers to a student who temporarily withdraws from an institution or system.

System Retention- "System retention focuses on the student and turns a blind eye on which institution a student is enrolled in. Using system persistence as a measure, a student who leaves one institution to attend another is considered a persister." (Hagedorn, 2005, p. 98)

Transfer- Community college to 4-year. A transfer student is one who (a) started in a community college, (b) earned more than 10 credits from the community college before, (c) enrolling in a 4-year college and (d) earning more than 10 credits from the 4- year college.

Withdrawal- refers to the departure of a student from a college or university campus.

Appendix B- Variables and Their Construction

Persistence.

As the point of this paper is to determine those factors that help students to persist, the positive response values of still enrolled and bachelor's degree attainment will be grouped and coded as 1, and the negative responses (left college with no degree) will be coded as 0. The BPS indicator for persistence is PROUTYX6 which lists several possible outcomes for students. This variable will be transformed into a dummy-coded variable.

Focal variables.

As noted in the methodology section, the variables of interest here are those which are academically focused. These are categorized chronologically: those which are experienced during either high school years, or during college.

High school academics. All of the high school background variables reported in the BPS dataset come from the surveys administered with the SAT or ACT tests.

High school math. Mathematics and momentum demonstrated very potent associations with bachelor's degree completion in the *Toolbox* studies. The present study will include the variable which reports the highest level of math taken in high school in preliminary statistics in an effort to better understand if this variable is as potent for students who delay as it is for traditional students. The BPS: 96/01 variable

HCMA THHI offers 6 responses which follow the accepted high school math curriculum path beginning at Algebra 1 and ending at Calculus. This variable will be transformed into a dichotomous categorical variable where the responses will represent whether the students reported having taken high school algebra 2 (1) or less (1). There is a high number of missing responses in this variable (504; 9%).

Standardized test score. The Beginning Postsecondary Survey reports scores from the SAT and ACT tests often used for admissions purposes. The BPS offers a variable that reports the scores from both standardized tests as an SAT score. This will be transformed to a z-score for consideration. The BPS respondents who had no SAT/ACT reported will be eliminated from the data set, as there is no way to impute a score in the absence of standardized test data.

Grade point average. The high school grade point average (GPA) is an important measure of academic persistence and a critical component in Adelman's construct of academic momentum. The BPS variable used to identify this is HCGPAREP, which is a categorical variable. This will be recoded into three groups which identify one third of the population each. The three categories will be -D to -B, B to B+ and A's, each category of grades will have its own variable that is dummy coded. It is important to note that within the sample population, even though the population was filtered for having reported a standardized test score which is the source of the data for the high school GPA variable, there are missing responses (538, or 10.2%).

College academics.

GPA- freshman year. Freshman year grade point average is considered to represent the first period of academic persistence for students and, as such, has great salience with regard to degree completion for all students. The BPS variable selected is SEGPA Y1. This variable is continuous, and the response levels represent 100*GPA as reported by the students in the telephone surveys or directly from the institution. This variable will be transformed to a z-score so that more nuanced information is available than if it was transformed to a categorical variable.

Credits earned- freshman year. The number of credits earned is a continuous variable- CREDHRS, which will be transformed to a dichotomous variable which denotes whether or not the student reached the 20 credit threshold that Adelman found to be associated with bachelor's degree completion. The reference group will be those who reported having reached the 20 credit threshold.

Social integration. The social integration index is offered as a counterpoint to the academic integration index. The literature suggests that for adult students, social integration is much less salient than is academic integration whereas the literature on traditional students indicates the opposite to be true. Inclusion of these two indices will serve to identify that persistence factors are distinct for these two populations of students.

The social integration index is a composite variable that is derived by the dataset. It compiles the responses to telephone survey questions about interactions specific to the

college experience that NCES deems to be social in context. The component variables that are included in this ranking include responses to, "How often have you:

1. Attended fine arts activities;
2. Participated in intramural sports;
3. Participated in varsity or collegiate sports;
4. Participated in school clubs; and
5. Gone places with friends from school" (National Center for Education Statistics, 2002, Electronic Codebook).

This variable is presented as a continuous score for activities deemed social in nature. 168.25 is the median score for this variable (National Center for Education Statistics, 2002). In an effort to make these variables easier to understand, Chen and Desjardins (2008) standardized these integration ranking variables by converting them to their z-scores with a mean of zero. This will be done and the positive scores will be assigned a value of 1, and 0 and negative score (0).

Academic integration. The academic integration index offered by the BPS dataset is composed of several components:

1. Belonging to a study group;
2. Had social contact with faculty;
3. Met with an academic advisor; and
4. Talked with faculty about academic matters outside of class (National Center for Education Statistics, 2002, Electronic Codebook).

Rather than testing the composite variable, this study will test each of the component variables from the 1998 survey of students regarding their academic interactions during their freshman year. These component variables have three responses: Never, sometimes and often. Any positive response will be considered as a positive response and assigned a value of 1. Preliminary statistics using crosstabs indicate that, prior to case deletions, there are at least 58 students who report delaying and the highest academic integration rating for each of the above indicators. With this in mind, the response values of 2 and 3, representing the responses “sometimes” and “often” will be assigned to be the reference group in the recoded binary variables for these factors that NCES identifies as climate factors. In other words, any positive response is distinct from the negative response “never”.

CMSTUDGP is the variable that represents the response to the question, “Please tell me how often you participated in the activity. Study groups outside of the classroom” (National Center for Education Statistics, 2002, Electronic Codebook, CMSTUDGP)?

CMSOCIAL represents the response to the question, “Please tell me how often you participated in the activity. Have informal or social contacts with advisor or other faculty members outside of the classrooms and offices” (National Center for Education Statistics, 2002, Electronic Codebook, CMSOCIAL)?

CMMEET represents the response to the question, "Please tell me how often you participated in the activity. Meet with advisor concerning academic plans" (National Center for Education Statistics, 2002, Electronic Codebook, CMMEET)?

CMTALK represents the response to the question, "Please tell me how often you participated in the activity. Talk with faculty about academic matters outside of class time" (National Center for Education Statistics, 2002, Electronic Codebook, CMTALK)?

Satisfied with instructor's ability to teach. The BPS dataset measures the student's perception of these factors in the freshman year as a reflection back during the first follow-up telephone interview in 1998. Specifically connected to the literature (Aslanian & Brickell, 1988), this first variable about faculty interaction with students is a valid place to begin to examine the salience of these interactions. The BPS variable SITEACH is a dichotomous variable that represents whether the student was satisfied overall with the abilities of the college instructors, or not. A positive response will be coded 0 for the reference, and a negative response will be coded 1.

Control Variables

Demographics.

Race. Many researchers have determined that white and Asian American students enter and succeed in higher education at substantially higher rates than do other students (Astin & Oseguera, 2002). In terms of operationalizing the race variable, some researchers, including Adelman (1999; 2006) have determined to use a dichotomous

variable where the minority students: African-Americans/ Latinos/ American Indians are compared to white and Asian-American students. For the purposes of the present study, race will be treated as a dichotomous variable, where the variable responses representing white and Asian-American students will be replaced with 0 and the responses for all other race/ ethnicities will be replaced with 1.

Gender. Males and females are certainly different from each other. We know that females attend at greater rates and attain degrees within a shorter timeframe than do males.

Gender is treated as a dichotomous categorical variable where males are coded as “1” and females are coded as “0” (Kaltenbaugh, et al., 1999).

Family income. Chen and DesJardins (2008) focused on income level in their 2008 study. They recoded the BPS data into three groups representing low income (less than \$ 24,999), middle income (\$25,000-\$74,999), and high (more than \$75,000). Adelman examines family income and likewise manipulates this continuous variable into a trichotomy. The BPS dataset offers many options with regard to family income. For this variable the researcher will utilize a variable that represents income percentiles for all students regardless of dependency status²⁸ in 1994. Chen and DesJardins (2008) also found that many students did not report family income. They also considered no reporting as a separate response category and found that those students who did not report

²⁸ Parent income is recorded for dependent students.

income were the most likely to withdraw. The information for this variable came from the FASFA forms as well as other sources, including the telephone interviews. This information was collected from all students. The present study will follow suit by manipulating a continuous variable representing the income percentile into three categories representing low income, middle income and high income in a manner similar to that utilized by Chen and DesJardins (2008) and Adelman (2006). The reference group will be the highest 1/3 of the distribution.

First generation. As was learned in the literature review, those students whose parents had no postsecondary experience had more barriers to persistence than did their peers. Students who delayed college entry are also more likely to be first generation students, so this variable will have added saliency for the present study.

The *Toolbox* studies define this variable as a dichotomous categorical variable indicating whether students had parents who attended any postsecondary education, or not. The BPS offers a like variable which can be manipulated into a similar dichotomous categorical variable. The variable PARED identifies students whose parents had any postsecondary experience. The reference response (1) indicates some postsecondary experience on the part of the parents; first generation students will be represented by a (0) response. This variable was derived by combining the responses to the questions for each parent's education. These questions were asked of all respondents in the original

NPSAS (1996) and in many cases the parent responded, where no parent telephone interview was held, the student response was used.

Delay. This is the most important independent variable for the present study. This is the variable that will separate the populations in order to determine the importance of academic factors on the persistence of students who delay college. The continuous response for delaying college entry will be transformed into a dichotomous categorical response representing whether the student delayed entry (1) or not (0). Before listwise elimination of missing responses, only 411 of the students in the sample population were students who reported having delayed their college experience at all.

Dependents. This variable was added to Adelman's framework to better consider the students who delay. The environmental factors that are so potent for the non-traditional student often include family obligations and the addition of this is to determine how this factor might impact the conditions of persistence for the population of interest. Although the restricted data indicate that 997 had dependents of some sort, after filtering the variables for this sample population, only 106 cases remained in the sample representing students with dependents, prior to listwise deletion. This variable was not used in the final models for the present study.

Enrollment. The institutional variable that this study will use in this sequence will be selectivity. BPS offers a variable that identifies four rankings of selectivity. This variable will be collapsed from four responses to two responses noting simply whether

the institution was selective or not. Based on the definitions in the electronic codebook for the BPS, the first two responses for the two highest ranks in selectivity will be collapsed to represent one response denoting a selective institution.

Selectivity. The literature tells us that students who attend a selective institution are statistically more likely to be persistent in college. Adelman found this variable to be salient with regard to bachelor's degree completion. The longitudinal cohorts (Transcript Studies) identified five values of selectivity and Adelman used the first two values, highly selective and selective to construct his dichotomous variable. The BPS variable for selectivity INSTTIER represents four ranks of selectivity for the first institution attended. An examination of the BPS responses suggests that the first two responses in the BPS dataset are similar to those used by Adelman to denote whether the first institution was selective or not (this represents the top 15.9% of the sample population); therefore this is how this variable will be transformed in the present study.

Institutional control. The majority of non-traditional students attend public institutions. Non-traditional students rarely enroll in liberal arts colleges, so the present study will examine institutional type based on control. The literature tells us that students who attend public institutions are statistically less likely to graduate, so this variable will be added.

The BPS variable selected to represent control in the present study is ITNPCT and it represents simply whether the first institution attended was a public institution or a private institution, and if private whether or not it is a for-profit institution. The variable will be transformed to simply note whether the institution was public or private.

Financial aid.

PELL. This variable represents the student responding positively to ever having received need-based grant aid in the first year. This variable, PELL (95-96) is continuous, but will be transformed into a z-score variable.

Loans. This continuous variable, TOTLOAN2, identifies the amount of monies received in loans by the student which will be transformed into a z-score variable.

Work Study. This continuous variable, TOTWKST, represents the amount of work study aid in dollars that is reported for that student in his/her freshman year. This will be transformed to a z-score variable.

Merit Aid. This variable is continuous variable representing the amount of merit aid a student received as was reported via self-reports, institutional reports and the federal financial aid (FASFA) forms. The variable will be transformed into a z-score variable.