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The Impact of Financial Issues on the Departure of First-Year, First-Time-In-College, Full-Time Students From a Public, Four-Year University

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THE IMPACT OF FINANCIAL ISSUES ON THE DEPARTURE OF FIRST-YEAR, FIRST-TIME-IN-COLLEGE, FULL-TIME STUDENTS FROM A PUBLIC, FOUR-YEAR UNIVERSITY

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Title: The Impact of Financial Issues on the Departure of First-Year, First-Time-In College, Full-Time Students From a Public, Four-Year University

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Nearly a third of first-year, college-going students at public institutions depart before their second year of study. The rate of departure is even greater for minority students.

Research on college student departure drew on Durkheim's early sociological studies of suicide, noting that students must perceive themselves to be sufficiently integrated within the institution in order to persist. Institutions front-load retention strategies into the first year, seeking to involve students more in academic pursuits and extra-curricular activities which tie students to the institution and to the goal of graduation. Critics suggested these strategies did not apply as well to minority students who transition into college outside the support of a majority culture. This dissertation questions whether students with insufficient resources also fall outside this framework.

The concept of the rational consumer of higher education suggests that students come to their institutions with full access to cost and benefit information, and that all financial decisions are made before a student matriculates. Recent theorists suggest first year departure may be associated with the student's recognition of the actual costs of higher education and his/her inability to meet those costs. This notion provides the foundation for the model for this study's research question: Do financial characteristics predict the departure of first-year, degree-seeking students?

This research used a one-institution, case study approach on a mid-sized, rural public university in northwest Pennsylvania to predict departure on two cohorts of first-year, full-time, first-time-in-college, baccalaureate-seeking students. Logistic regression was applied to secondary data gathered from the cohort population of these first-year students in two successive years.

The results of this study were consistently significant for room and board increasing persistence, confirming Astin's theory of student involvement. Although the effects differed from year to year, there were also significant results correlating higher tuition and fees and FAFSA submission dates with predicted increases in departure. These were believed to be related to the non-resident tuition policy and financial aid processes in effect at that time. The use of logistic regression on existing secondary data combined with awareness of current financial policy changes suggests a promising strategy for improving first-year retention.

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CHAPTER I

INTRODUCTION

Statement of the Problem

On average, nearly a third of students who start a four-year, bachelors-degree program at a public institution of higher education leave before starting the second year (ACT, 2011). First-year students leave at this rate despite decades of efforts by institutions of higher education, individually and collectively, to learn how to keep them until graduation (Terenzini & Reason, 2005). The dropout rate for first-year student is worse for men and, except for Asian and Pacific Islanders, minority students (Baum, Ma, & Payea, 2013; Clarion University of Pennsylvania Office of Institutional Research, 2015; Ishler & Upcraft, 2005). A student who drops out in the first year foregoes the median salary of a college gradate, a salary $21,100 higher than a comparable high school graduate (Baum, et al., 2013), while incurring the cost of that education, often borrowed.

Moreover, students and the many public institutions of higher education that serve them are intertwined in a destructive spiral of increasing costs. American college and university residential campuses were often located in rural areas to encourage a focus on academic pursuits (Gumprecht, 2008). As these institutions compete with each other for enrollment, on-campus residences have become a requirement (Clarion University Housing FAQ, 2015) rather than a preference, and the residences and the amenities that support them have become more expensive. As students and parents have become discouraged by higher residence costs, so too have taxpayers and the legislators that represent them become dismayed by the cost increases necessary for the academic

mission and support services. This has been one cause for ongoing decreases in state support for higher education. To some extent, these are then offset by increases in tuition and associated fees that further exacerbate the problem for the student.

States and student-consumers have looked for lower-cost alternatives to the residential campus, such as distance learning or certificate programs. For many small- and medium-size residential campuses, their long-term survival depends on the success of first-year students and the residential approach to keeping them. However based in part on stagnant retention trends (ACT, 2011), the future of these institutions and the residential model does not look promising

Thus despite the abundance of retention research, the high percentage of first-year dropouts suggests there is more to learn about students who drop out and why they do so. The effect of finances on student departure can be confusing because higher costs may not only contribute to student departure, but can also reflect an institutional strategy to attract and retain students. My research objective is to examine whether financial characteristics for first-year students predict these students' departure before the start of their second year.

Researchers often frame student departure from an academic, student affairs, or public policy perspective, but seldom consider student departure within a financial framework. Accordingly, the role of financial issues in student departure has often been overlooked or casually dismissed as less important or post facto rationalization. Moreover, much research in the field, which is based on a post-positivist research paradigm, has built on previous research, which provides less chance of contradicting the prevailing opinion.

Retention research has highlighted important concepts and theory about the phenomenon of student dropout by generalizing from large studies of successful, returning students, rather than drawing on data regarding students who dropped out. In the process the research obscured the factors unique to departing students, the limitations on small to mid-sized public universities, and the year in which the departure occurred. Yet these factors are important because the financial environment and the rules governing finances and the institution change significantly and frequently.

At minimum, this study seeks to identify financial variables which have the power to predict departure of first-year students. Additionally however, where inconsistencies occur in the predictions, it seeks to explain possible reasons why the predictions are inconsistent. This should help to develop a more complete and nuanced model for predicting departure for financial and other related reasons. This may also suggest guidelines for policy changes that could impact student persistence. At this juncture, such changes are a necessity for the survival of institutions in the face of fierce competition for students, and the increasing financial pressures that impair institutions' ability to attract and retain these students.

This chapter begins by explaining the traditional cost-benefit model of higher education that has provided the economic foundation of retention theory to this point. Real-world data are then used to illustrate first-year cost and returns under the cost-benefit model, the impact of dropping out in the first year, and why the costs may be higher for some students, based on income and the type of institution they attend. As noted earlier, part of the difference in costs result from the housing and amenities which institutions have increasingly considered necessary in order to attract students. Other

cost differences have arisen from the way in which state institutions have been funded, and a section is provided to explain why this may be so. This chapter concludes with the research question suggested by this review of higher education and financial trends. A guide to subsequent chapters then lays out how this study answers the research question.

The Cost-Benefit Model and the Rational Higher-Education Consumer

Popular opinion holds that the decision to pursue a college degree is a well-considered economic decision based on an abundance of readily-available information. The leading retention economist, Gary Becker (1993), and the leading retention theorist, Vincent Tinto (1975) both see the student as a rational consumer who attends college because they expect the return on their education to be greater than the cost (Becker). Conversely, students leave when they decide doing something else with their time, money, and effort will pay a higher return than a college education (Tinto, 1975). While the research models suggest that the process of and motivation for applying, staying, and leaving is more complicated than that, the focus is on the student's cost and return.

The potential return of a college education is supported by current research. According to a report of the College Board, the college graduate could expect a return of 15 percent per year on that investment, greater than the equivalent return on an investment in stock or corporate bonds in that period (Baum, et al., 2013). Moreover, the College Board estimates that a student who attends a public four-year college would earn enough to pay back the cost of college, the cost to borrow the money for college, and the cost of four years being out of the labor market by the time the student turns 33. However the situation is admittedly different for the student who drops out during the first year.

The Cost of Dropping Out in the First Year

Sallie Mae's study, "How America Pays for College" (2013) provides some useful guidelines for preparing an illustration which allows us to more carefully assess Becker's cost-benefit model. Average cost data is provided from the public university in Pennsylvania which provided the case study data used later in this dissertation.

A student's family would have borrowed an average of 22% of the cost of a first college year, about $5,073. The student, the parent, and relatives and friends would have contributed over twice this, $10,377 from income and savings for the student's year of education. The debt would have to be paid from a median salary $21,100 a year lower than that of a college graduate (Baum, et al., 2013). Exhausting savings and income, while potentially foregoing earnings attending college, often leads to defaulting on the student loan, negatively impacting the student's credit report (Gladieux & Perna, 2005). Additionally, a student who dropped out would have been almost twice as likely to be unemployed as a college graduate in 2010 (Baum, et al., 2013).

Not all of the costs of dropping out are tangible and measurable however. The literature of retention frequently cites the need to dissociate from former friends and even family in order to adopt new behaviors and social networks that will help the student's education and adjustment to college life (Tinto, 1993). Paradoxically, encouragement from family is crucial to college success (Cabrera, Nora, & Castaneda, 1992). Instead, those students who drop out in the first year have spent that year decreasing the contact and support from those who would be most able and willing to help that student transition to post-college employment or transfer to another institution. As a result, students who

drop out may find themselves with even fewer resources to build a future than before beginning their college education.

Economic trends in recent years have further worsened the situation for those in lower income brackets. Changes in the U.S. economy have decreased available financial resources for middle- and lower-income students and their families in particular. For many, this situation has pushed finances to the forefront, potentially making it a primary reason for the departure of some students and a contributing factor in the departure of others. This change is particularly relevant, given that Tinto and other major theorists conducted much of their theorizing and research prior to the mid 1990s, and the events in the past two decades may have pushed financial issues to the forefront as a primary cause for departure.

In some ways, federal financial aid has grown with the cost of higher education. However, the nature of that aid has also changed, which has further impacted the financial burden students carry. The last 20 years have seen grants decreasing from 51% of federal aid to 35%. As this occurred, a new category, educational tax benefits, grew from zero in 1992-93 (Baum & Payea, 2003) to 13% of federal aid in 2012-13 (Baum & Payea, 2013). At first glance this might appear inconsequential, however many low income families do not qualify for tax credits. As a result, low income families used tax credits to fund higher education less than half as much as high income families (Sallie Mae, 2013).

Besides tax credits, low income families cover 20% less of the cost of higher education from income and savings than high income families since they have less income and savings to draw on. This means low-income families pay for college through

loans, credit cards, or other more costly options. Further, lower income and savings also means that fewer low income families (42%) have a plan for financing all four years of college or for financial contingencies or emergencies (36%) than higher income families (Sallie Mae, 2013). As a result, financial challenges are more likely to divert lower income students' education, leaving them at greater risk of dropping out. Thus, if a lower income student departs before graduation, that student is more likely to have debt resulting from the college experience.

The above is meant to suggest that changes in financial aid and taxes over recent years may have led to a greater risk of departure for low-income students and a higher cost of education. A more difficult economic environment confronting public institutions of higher education in recent times also suggest higher costs of education and levels of departure depending on which institution a student attends.

How Financial Stress on Some Leads to Greater Financial Stress on Students

Well-off institutions are better able to compete for more academically gifted and financially-advantaged students. They do this by offering more financial aid without regard to need, and higher quality amenities (Immerwahr, Johnson, & Gasbarra, 2008). Less well-off institutions have limited flexibility to offer aid. However, they still try to compete on amenities, while absorbing appropriation and tuition gaps by increasing class size and reducing service levels where possible (Immerwahr, et al., 2008). This phenomenon is often termed stratification of higher-education (Wellman, Desrochers, & Lenihan, 2009). Current trends suggest further and more severe stratification is due in the future.

Thus more academically gifted and financially advantaged students go to higher quality institutions with better amenities (Immerwahr, et al), and receive financial aid based on merit instead of need. Conversely, for less financially well-off students, this translates to lower academic quality, higher costs for expanded amenities, and reduced financial aid to pay for their education. Further, for public institutions, state funding formulas compound the problem, as discussed in the next section.

The Impact of State and Federal Funding Models

To understand how funding for higher education reached may disadvantage a segment of their consumers, it's better to consider it in the context of the mission of public higher education.

States fulfill a social contract with colleges and universities to serve multiple stakeholders: students, parents, business, the local community and the public at large (American Association of State Colleges and Universities [AASCU], 2005; Burke, 2005). Under the Morrill Acts of 1862 and 1890, the federal government reinforced the primary responsibility of the states to provide publicly accessible higher education, and limited the federal role (Fitzgerald & Delaney, 2002).

State and federal governments invest in public higher education for economic reasons that parallel those for students and parents, i.e. expected benefits that exceed the costs (Becker, 1993). Just as students look for higher earnings commensurate with degree completion, states invest taxpayer funds to produce a well-educated workforce capable of earning more and paying more taxes (Fitzgerald & Delaney, 2002). However, determining the return on the financial investment in higher education is difficult, due to challenges in attributing the specific benefits to the investment the state makes in higher

education (Becker, 1993). Accordingly, in the political process, it can be easy to underestimate the return on higher education investment, and argue for cuts to the investment in higher education appropriations.

For different reasons, the federal government encounters a similar problem. Like the states, the federal government supports higher education to boost economic development, but the federal government has in the past also used it for national security purposes and to assist in the transition of veterans to civilian life (Berger & Lyon, 2005). The federal government provided educational funding to veterans through passage of the GI Bill in 1947 and later iterations thereof, establishing a strategy of supporting higher education by putting money directly in the hands of students (Fitzgerald & Delaney, 2002). The federal government's own commitment to provide access, college choice and persistence, especially for low-income students, is reflected in the legislative intent and enacting language for the Higher Education Act and its reauthorizations over the years (St. John, Cabrera, Nora, & Asher; 2000).

The 1965 Higher Education Act provided matching funds for need-based state grants, as did the last significant GI Bill funding in the 1970's (Heller, 2003a; Paulson & St. John, 2002). Since then, however, support for low-income and minority access to higher education has declined on the federal, state and institutional level (Heller, 2003a). Instead, the Middle Income Student Assistance Act of 1978 and the Higher Education Amendment of 1992 responded to increasing costs of higher education by redistributing aid originally intended for low-income student to all income levels (Alexander, 2001; Heller, 2003a).

Together, these two pieces of legislation decreased the maximum award for the Pell grant, held the primary aid source for low-income students stagnant, and established and expanded the non-need-based, unsubsidized Stafford loan program. They also initiated higher education tax credits, which benefited middle- and upper-income families since lower-income students did not qualify for credits (Wolanin, 2003).

A few states also moved away from distributing scholarships based on financial need, instead incorporating merit factors in their eligibility requirements (Heller, 2003b). State financial policies were not intentionally created to limit financial aid to needy students. These policies had that effect however, since new aid programs crowded out existing aid when a finite pool of resources was available (Dynarski, 2004; Heller, 2003b).

Declines in state appropriations for higher education further decreased resources available for financial aid, education, and support services (Heller, 2003b). This played a part in tuition increases for four-year institutions for that period (U.S. Department of Education National Center for Education Statistics [NCES], 1998), since state governments have historically used appropriations to keep tuition rates low (Dynarski, 2004).

State institutions of higher education have two primary cash flows: state appropriations and tuition. For public masters-level institutions, state appropriation funding made up two-thirds of the revenue for educating a student a decade ago. After declining over the last decade, state appropriations today cover less than half of a student's funding, with tuition now providing the difference (Kirshtein & Hurlburt, 2012). As a consequence, students must bear a higher proportion of the costs in tuition

and fees. Yet at the same time, we see a reduction in need-based financial aid and other financial options to help lower-income students pay for higher education. The alternative for low-income students, usually expensive college debt, undercuts the return on higher education for students who stay until graduation, but creates worse problems for those who leave without a degree.

Public institutions of higher education struggle for autonomy, even while depending on external parties like the federal and state governments, students, and their parents for funds (Pfeffer & Sancik, 1978). The decline in state appropriations by necessity led to a larger share of institutions' budgets paid by tuition revenues; however tuition rate increases have been constrained by state decision-makers and competition with other institutions. Additionally, the need to meet costs of regulation (Immerwahr, et al., 2008) further limit instructional expenditures per student (Wellman, Desrochers, & Lenihan; 2009).

Fees, generally set by institutions, provide some budget relief and, depending on institutional policy, can provide a source of student financial assistance. As budgets shrink however, institutions become increasingly market-driven (Kirp, 2004), and institutions compete more on price and amenities such as more comfortable housing and more appealing food service (Immerwahr, et al., 2008), so fee revenue is diverted to non-instructional purposes.

However, for public institutions, state funding formulas also compound the problem, in other ways. For example, rather than addressing unsustainable competition for amenities, these formulas seek to incentivize institutions to grow enrollment and improve retention. The increased financial burden on lower income students may

contribute to public institutions' declining enrollments and increased early departure, thereby leaving the state funding formulas further compounding an institution's tuition losses through related cuts in funding.

Higher education represents an investment in human capital (Becker, 1993) and cultural capital (Bourdieu, 2001) by students and their families in order to accumulate wealth. We should be concerned that states' decreasing support for public higher education suggests that states perceive their return on investment in public higher education is decreasing. Additionally, the cost of on-campus student residences and participation in student activities is high and increasing, especially for poorer students.

Thus pubic investment in higher education is declining, with differential impact on lower income students. These trends suggest that the retention literature must consider a more prominent role for the impact finances may have first-year student departure. As such, this provides an opportunity for research on student financial characteristics that may lead to departure.

The Intent of This Research

The following research questions guide this study:

1. Do financial characteristics predict departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students from a rural masters-granting state institution of higher education during the first year?

2. If financial characteristics do predict first-year departure, do the results differ for different races, ethnicities, or other underserved groups?

The purpose of this study is to analyze whether financial characteristics play a role in the departure of first-year students at a mid-sized public university. The research

uses a case study approach focusing on a mid-sized public university, Clarion University of Pennsylvania, because these institutions seem to be most at risk of being consolidated or downsized based on recent trends in enrollment and funding, as much as their students are at risk of departing early in their pursuit of higher education.

This is a quantitative study analyzing secondary data for each year of two successive cohorts of first-year, full-time, first-time-in-college, baccalaureate-seeking students at this university. The research focuses on full-time, baccalaureate-seeking students because departure before graduation for part-time students or students who don't seek a degree may be part of a conscious plan to stop out, making it less critical to these students' future. The study focuses on first-year and first-time-in-college students because these students are more likely to drop out than other students, making more retention research available for them including specific statistical reports available from most universities.

Clarion University of Pennsylvania is a primarily residential, public, four-year, inclusive (Carnegie Foundation, 2011) university located in the borough of Clarion in a rural area of northwest Pennsylvania. The university is the largest employer in the Borough of Clarion. Clarion University of Pennsylvania is a part of the 14-university Pennsylvania State System of Higher Education (PASSHE) and offers on-campus and on-line associate, bachelors, and masters degrees (Clarion University of Pennsylvania Middle States Steering Committee, 2012).

Drawing the research population from one university is a matter of convenience, however Pennsylvania also provides a logical focus for the research because of the greater number of institutions of higher education within the state vying for the same

students. Additionally, while studies using system-wide, aggregated data are helpful, the data is more difficult to gather and Tinto (1993) maintains that only data from a given institution can lay the groundwork for changing retention strategy at that institution.

This study fills a gap in retention research by identifying and examining pre-college and first-year student financial characteristics that contribute to students departing. The financial environment for these students changes from year to year, limiting generalizability, but the data gathering, analysis, and conclusions provide useful information for practitioners and, to a lesser extent, those working in public policy governing higher education and student aid funding.

Unlike much of the previous research in this area, this study speaks to higher education student departure, rather than retention. Some contributors in the field (Adelman, 2006) suggest that studying retention presents a more positive context. This study, however, represents a conscious decision to study the issue from a student perspective: attrition (the institution losing a student) rather than retention (the institution keeping a student); and departure (a student leaving the institution), rather than persistence (a student remaining at the institution until graduation).

This is a quantitative study analyzing two years of secondary data for each of the first-year student cohorts at Clarion University. The research examines whether student characteristics differ between departing students and persisters, as well as to what extent demographic differences, such as ethnicity or gender or differences in participation in campus life, such as on-campus housing or athletic activities, are related to or accompanied by financial differences.

The findings inform recommendations to institutions on how to improve access to financial information, and thus have the potential to reduce first-year student departure. The findings also counter the assertion by some retention researchers that finances do not play a significant role in student departure after matriculation. In doing this, the research suggests flaws in the economic model of retention, specifically, that a rational student consumer balances costs and benefits to support her college admissions decision, and later her decision to persist or depart.

Chapter Summary and Introduction to Subsequent Chapters

This chapter has identified why financial issues are a problem that may lead first year students to depart higher education. It suggested how particular students may be at risk and why mid-sized regional public universities may exacerbate the problem as they try to address unfavorable economic conditions. In the next chapter, the literature review cites key authors on college student departure and retention, leading into a discussion and model of the impact of financial issues on first-year departure. The chapter ends with relevant research questions and hypotheses that challenged aspects of current research and a section that identified and defined the key terms and variables which could be used in a financial model.

The third chapter reviews the methods used and the institutional setting, then explains how research variables used in this study were operationalized and how data were collected and analyzed based on the model, definitions, and hypotheses. This chapter finishes with a discussion of possible validity, weaknesses, and limitations.

The next chapter begins with descriptive statistics from two cohorts of first-year students at the institution being studied. It then compares gender and race enrollment

trends with data for sister universities within its state system and bachelor granting institutions nationally. Variables from the student cohort data are then analyzed to see which serve as significant predictors of student departure before the second year, and whether financial characteristics perform as well as other variables suggested by the literature. The final chapter interprets and discusses the results, and weaknesses and limitations for those results, ending with recommendations for further research.

CHAPTER II

REVIEW OF THE LITERATURE

Chapter Overview

This chapter summarizes the literature on retention and departure of college and university students. It highlights the sources of more widely accepted retention theories, how the research and researchers differ, and how they influenced one another. The literature review recognizes the paradigmatic status of Tinto's research, while noting flaws in the role of financial issues put forward in Tinto findings, as suggested by Bourdieu and Simon.

Finally, St. John & Cabrera's nexus model is used as a springboard to explore Becker's theory of the rational consumer of higher education, which assumes full and equal access to cost and benefit information. The review closes by locating departure for financial reasons at the decision point during the first year, where the student consumer recognizes more fully the costs of higher education and the inability to meet those costs with available resources. This lays the groundwork to develop a new model extending Tinto's research, while recognizing the place of financial issues in departure. The review of literature is followed by a list of definitions of variables which are operationalized as variables in the research.

Thinking on student departure and retention has changed over the years however, as researchers gained acceptance from their peers. Therefore it's useful to begin with a key terms which are used in the research question and hypotheses. This is followed with a history of retention research in the United States which will clarify how the focus of

retention has changed over the years and why this makes our choice of terms more important.

Definitions for Student Persistence and Departure

Persistence. A first-time-in-college/university (FTIC), degree- or certificate-seeking, student who, once enrolled, stays at an institution until graduation (Hagedorn, 2005; NCES, 1998)

First-Year Persistence or First-to-Second-Year Persistence. A first-time-in-college/university student who, when enrolled at an institution in a fall semester, re-enrolls for the subsequent fall semester at the same institution (NCES, 1998)

Cohort. A group of students beginning the fall semester at the same time, at the same institution, with the same characteristics; in this case first-time-in-college/university (FTIC) students degree- or certificate-seeking students with fewer than 12 student-credit-hours before the fall semester (Mortenson, 2005)

Departure (also referred to as Drop-Out). Leaving school (only one institution for the purposes of this research) before graduation (Hagedorn, 2005)

First-Year Drop-out or First-to-Second-Year Departure (also referred to as Drop-Out). A first-time-in-college/university (FTIC) student classified as a first-year student who, when enrolled at an institution in a fall semester, fails to re-enroll for the subsequent fall semester at the same institution (Hagedorn, 2005; NCES, 1998)

The above list is by no means complete, but introduces the reader to terms explored by theorists and will be elaborated on as each model is addressed in turn.

The Beginning of Retention Research in the United States With John McNeely

The start of research on student departure in the United States can be traced back to John McNeely's 1937 study of "student mortality" produced for the Department of the Interior (Berger & Lyon, 2005). Retention topics since McNeely have transitioned from student mortality to attrition to retention, reflecting a change from studying individual students' exits during their college career (mortality and attrition) to studying institutional trends (primarily retention) for student groups (Berger & Lyon).

McNeely's study is important, not because current research references it, but because it shows that the language of departure is a moving target, reflecting the background and context of the researcher and stakeholders in that research. This is doubly true in studying the effect of financial issues on departure. Financial issues receive less attention as a cause for departure partly because departure and retention are seldom studied by researchers with a financial background, but also because the rules set by the state and federal agencies governing tuition, fees, and financial aid change from year to year making study more difficult.

Choices of terms and focus of study have also been determined by who the major stakeholders were in the public policy arena at a given point in time, and their roles. Terms used for studying college students also convey value judgments, so attrition may be interpreted as worse than retention, even though the student may not have graduation as a goal (Tinto, 1987). Student departure also did not stop being compared to death with McNeely, reflecting not only great concern for the early departure of students, but also the importance of Durkheim and the field of sociology to retention research as we see with Spady.

Spady's Model of Student Sufficiency

William Spady (1970) criticized previous retention studies as being philosophical or descriptive, rather than analytical, and lacking empirical verification. He suggested that theories, without a conceptual model to guide them, produced ex post facto correlations with unsupported variables (Pascarella & Terrenzini, 1979). Instead, Spady (1971) recommended a multi-disciplinary, theory-based approach based on data from admissions forms and follow-up questionnaires.

Spady applied Durkheim's study of the motivation to commit suicide to student departure (Berger & Lyon, 2005). In Spady's model, successful students disconnected from old friends and norms while connecting with other students and the institution, and adapting the new values of both, a concept referred to as normative congruence (Spady, 1970). When students did not share values or find support within the campus community, they failed to integrate with the new institution and had a greater probability of withdrawing.

Conversely, Spady explained why students continued in school with the concept of "sufficiency", meaning they had achieved a threshold of student integration with the institution (Pascarella & Terenzini, 1979). Spady thought the key to persistence was not whether students interacted enough to continue, rather whether they perceived themselves to have interacted adequately with the university and campus community (Tinto, 1975). Favorable grades, for instance, increased persistence because they positively influenced student perception (Metz, 2005). Spady (1971) also tested his model by surveying students on their perceptions of the environmental and social characteristics of the institution.

Spady was the first to take a sociological, rather than a psychological approach to student departure (Berger & Lyon, 2005) in his application of Durkheim's theory of suicide to student departure. He was also the first to suggest that institutional fit had a positive impact on student persistence, and distinguished between institutional student departure (before degree completion) and system departure (before attaining any degree).

While Spady's research provided a valuable initial framework which later researchers built upon, Spady's (1970) variables were difficult to operationalize and generalize to other institutions. Accordingly, his research could not be easily replicated (Berger & Braxton, 1998). That said, it provides useful elements for this study.

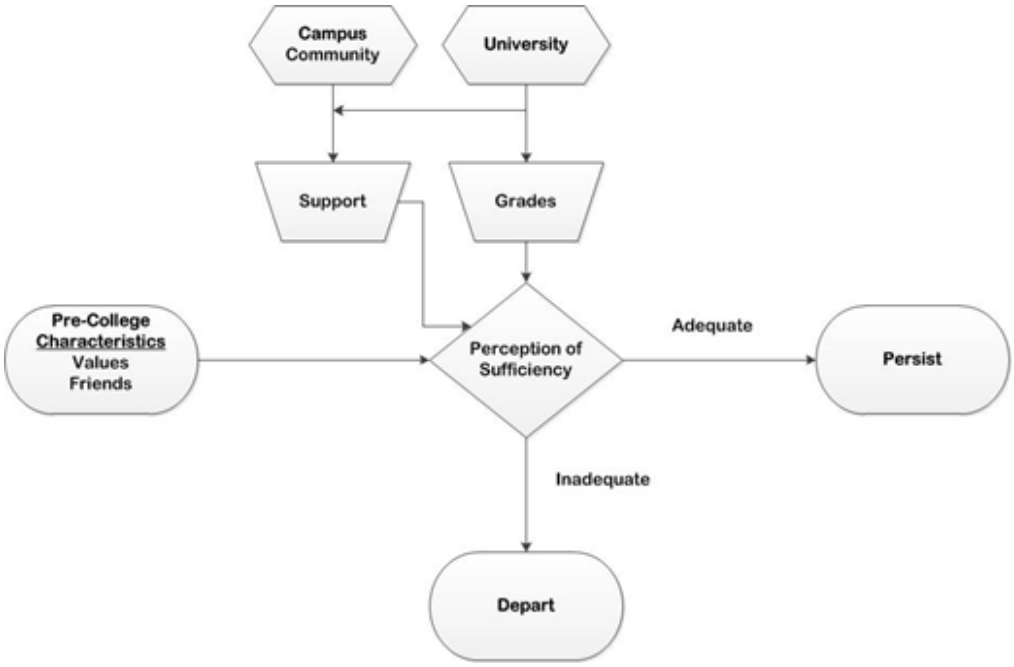

Figure 1. Adapted from Spady's (1971) model of student departure with permission.

Spady recommended using a theory-based, sociological approach to retention research gathering secondary data from the institution of higher education. Flaws with that approach noted by critics also suggest caution when interpreting the results of secondary data for this study. Spady suggested higher grades can motivate student

persistence for instance, however this may run counter to the primary purpose of grades to reflect student academic performance. Correspondingly, for the purposes of this study, increased costs of higher education can reflect additional activities supporting that education, thereby persistence, but may also signal future difficulty for a student and the student's family paying the increased costs. Finally, Spady's suggestion that a student needed to perceive sufficiency in order student to persist might be the most difficult to apply and compare between students and institutions.

Astin recommended instead that student integration be substituted for sufficiency and suggested that integration could best be achieved through student involvement. He further recommended that Spady's one-institution research method be expanded to a longitudinal perspective through multi-institutional data.

Astin's Student Involvement Model

Alexander Astin (1970) found lessons for improving retention research in Feldman and Newcomb's (1969) review of previous departure studies. He expanded on Feldman and Newcomb, Astin suggesting previous researchers focused on single institutions and ignored the longitudinal nature of student experience. In doing so, they obscured the impact of the institution on students, and even reached conclusion s and offered recommendations contrary to recommendations more rigorous methods would have suggested (Astin, 1997). Astin suggested instead a theory of student involvement, equating persistence with the amount of time and energy students devoted to their academic pursuits.

Astin (1970) recommended multi-institutional longitudinal studies to remedy the gaps in previous research. He followed his own recommendations with extensive

analysis, using nationwide student data (Astin, 1997) from the Cooperative Institutional Research (CIRP) freshman survey. This methodology allowed him to introduce a system definition of dropout to his research, showing student movement between institutions, rather than just considering students' persistence or departure at one institution.

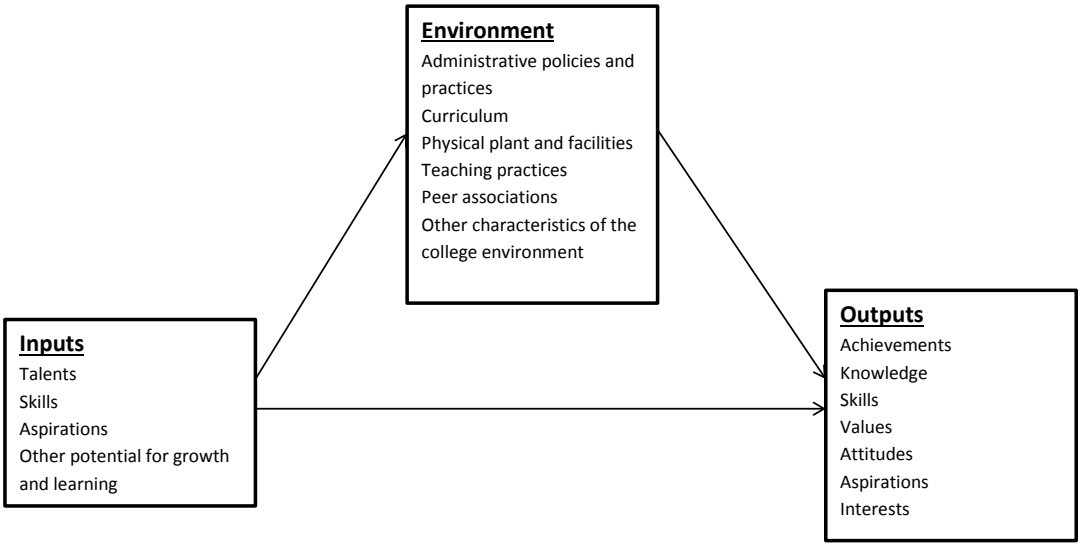

Figure 2. Adapted from Astin's (1997) input-environment-output (IEO) model with permission.

Astin (1970) based his theory on an Input-Environment-Output (IEO) model developed through extensive study of the institution's complex environmental impact on students as opposed to merely investigating an individual student's characteristics. Student inputs were the students' talents and skills which would adequately prepare them for college (Astin). The environment included the institution's policies and procedures, faculty and facilities, and curricula (Astin). Outputs were the knowledge, skills and achievements acquired or developed while at the institution (Astin).

Astin (1997) suggested that more successful institutions involved students and retained them until degree completion, through curricula which challenged students. Furthermore, successful institutions encouraged development of students through on-

campus residences which built a sense of community (Tinto, 1993) and allowed more time for academic tasks (Astin). Institutions still had to compete for students' time with work, family and friends (Astin), but on-campus residences provided the advantages of proximity and convenience. These findings strongly supported the connection between student involvement in campus life and retention, and found financial aid to be positively related to persistence (Astin).

At first glance, Astin's (1970) recommendations for longitudinal, system-wide retention research may appear to run counter to the single-year, one-institution, case-study approach used for this research. While there is an important place for Astin's research, retention researchers (Pascarella & Terenzini, 1991; Tinto, 1993) also advocate single-institution studies, particularly to drive institutional policy at the institution being studied. Additionally Astin (1997) highlighted the importance of student residence, physical plant, financial aid and student employment which paved the way for consideration of the financial impact of these items on students.

Notwithstanding Astin prescribing the above for successful retention efforts, some theorists criticized Astin's work for not being specific enough about how inputs and environment create outputs (Bean & Eaton, 2002; Pascarella & Terenzini, 1991). Bean turned to a human resources model to provide a framework for unbundling the effect of environmental and institutional variables on a student's persistence and the mitigating effect of a student's goals and expectations.

Bean's Business Intent Model

John Bean (1980) criticized previous research because the resulting programs had not increased the overall rate of persistence, and because the research provided no

clarification of the mechanisms of social integration, nor their effect on persistence or departure (Bean & Eaton, 2002). In its place, Bean (1985) offered an organizational model of student departure based on Price and Mueller's 1981 study of employee turnover in organizations.

Bean (1980) collected data through Likert-scale surveys, then measured the results against the student departure behavior using multiple regression and path analysis. Among the issues Bean highlighted as leading to departure were the effect of students on each other and the effect of external environmental factors on nontraditional students.

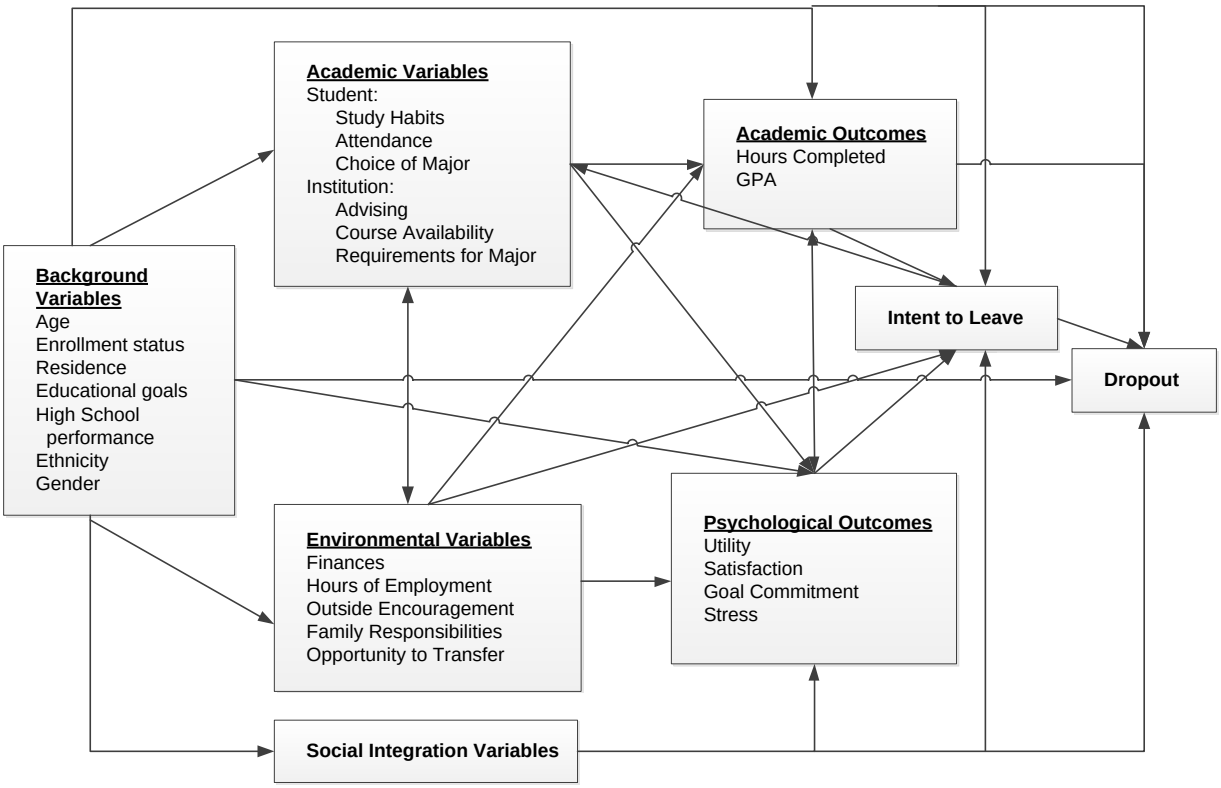

Figure 3. Adapted from Bean's (1985) model of student departure with permission.

Bean (1985) substituted grades for income as the reward for good study habits (Tinto, 1993). Working with Metz, Bean added academic variables from high school and college and psychological variables measuring external influences like family and stress

(Metz, 2005). Expanding on Astin's work, Bean recognized student intent, goals, and expectations in his revised persistence model (Metz). Bean improved on Astin however by clarifying the mechanism whereby student behavior would lead to persistence.

Bean and Eaton (2002) suggested that student success depended on students developing coping behavior to allow them to adapt to the new institutional environment, thus integrating academically and socially into their institution. Bean then added as an intervening variable intent to persist which then would lead to persistence, while unresolved intentions and poor choices would conversely lead to departure (Tinto, 1993).

Bean's (1985) comprehensive departure/retention model helped in understanding the impact of the organization, its structures and process on college student retention. Bean also suggested that college experiences influence students' beliefs and behaviors, including their decisions to persist in or leave the institution. Bean's research has provided the foundation for a good deal of this study, including the basic framework, many of the variables used, and the choice of regression as a method of analysis. Bean was also one of the first major retention theorist to highlight student finances as an important variable. He seems to downplay the non-academic elements of the institution and its characteristics however, choosing instead to concentrate on the student and the classroom. Given the resources institutions devote to extra-curricular programming to support involvement and retention, that omission would seem to be an oversight, however minor.

As valuable as Spady's, Bean's, and Astin's contributions were, they treated students' college careers as a continuum, each year as important as each other. Terenzini and Pascarella chose to focus on students' first year as crucial to their future persistence.

In doing so, they established a model that led institutions to concentrate their efforts in the first year to help students persist until graduation.

Terenzini and Pascarella Focus on the First-Year Student

Terenzini and Pascarella (1998) identified reasons first-year students depart before their second year. Students leave for reasons external to the institution like finances or other personal circumstances or institutionally-related reasons like an inappropriate fit between the institution and a student's learning styles or needs (Terenzini & Pascarella). The student may be unable to manage schoolwork or fit in socially with other students (Terenzini & Pascarella). First-year students may not be motivated or not have the right role models to become motivated (Terenzini & Pascarella). Finally, transition to college may just overwhelm some freshmen (Terenzini & Pascarella). Terenzini and Pascarella found ample evidence that a student's first year is pivotal to persistence, which explains why institutions "front-load" retention measures in the first year (Tinto, 1988).

Tinto borrowed from all of the above researchers used Van Gannep's concept of "rites of passage" to explain the process by which students make the transition from pre-college to academic life and make the critical decisions to persist or depart. In doing so, he developed a comprehensive theory which incorporated the findings from previous researchers, while clarifying why students depart.

Tinto's Meta-Theory and Rites of Passage

Vincent Tinto (1975) echoed Spady's criticism of previous researcher's lack of specificity in defining dropout behavior. Tinto (1987) referenced Durkheim's writings on

suicide, and applied Van Gannep's concept of "rites of passage" to describe the student coping process which would lead to their persistence in higher education or departure.

Van Gennep argued that succession between groups was marked by rites of passage in three stages, separation, transition, and incorporation, each marked by its own ceremonies and rituals (Tinto, 1988). These rituals not only served to publicly announce the movement of the stranger to membership in the community but also provided a visible structure to assist the stranger in coping with the difficulties that movement entailed (Tinto, 1988).

Tinto suggested equivalent stages as students adapted to life in a college environment. In separation, students disassociated themselves from past communities, family and friends (Tinto, 1988). In transition, after the separation from old norms but before the full adoption of new norms, students encountered the stresses which could lead them to depart (Tinto). If they did not leave, they entered the final stage, "incorporation", where, having adopted the norms of the college community, they were now integrated into that community as full members.

Echoing Spady, Tinto (1993) proffered that the student's perception of integration mattered more than integration itself. Tinto's model argued that the process of dropping out from college could be viewed as "a longitudinal process of interactions between the individual and the academic and social systems of the college during which a person's experiences in those systems continually modify his goal and institutional commitments in ways which lead to persistence and/or varying forms of dropout," (Tinto, 1975, p. 94).

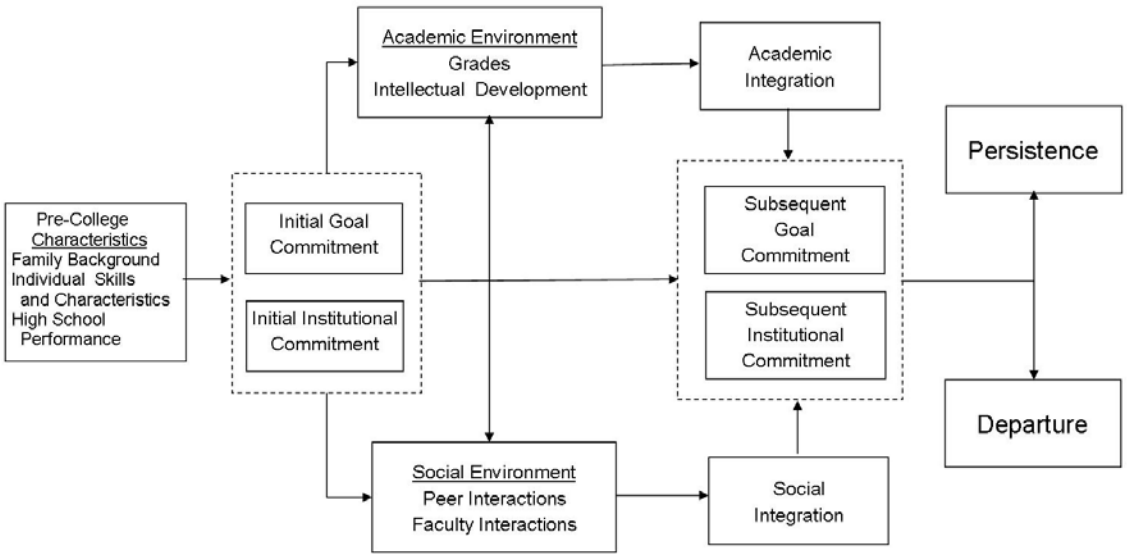

Figure 4. Adapted from Tinto's (1993) student integration model with permission.

Tinto (1993) noted Van Gennep's rites of passage were especially relevant to first-year students, arguing that students' behavior patterns were different in the first year than later years. In the first year, students separated themselves from past friends and values, but had yet to master integration into new college communities (Tinto). They were trying to navigate the institutional system (Tinto, 1988) and had to "learn the ropes" of college life largely on their own (Tinto, 1993). They didn't withdraw less from the transition to the norms of the new college community, rather from the stress the transition imposed on them (Tinto, 1987).

Tinto (1993) also incorporated Bean's organizational insights in his model. Previous researchers had noted that organizational size and complexity impacted student outcomes (Kamens, 1971; Braxton & Brier, 1989; Pascarella & Terenzini, 1991), and Tinto found Bean's elaboration of organizational policies, procedures and structure useful in explaining how that came to happen, particularly in the first year. First-year retention was affected by how schools communicated rules and expectations, enforced rules, and

encouraged participation (Berger & Braxton, 1998). Tinto (1993) felt that Bean's organizational perspective didn't serve as well to explain student behavior within the organization however, as it did to explain the behavior of the organization in regard to students (Tinto).

The widespread acceptance of Tinto as the predominant retention author may have much to do with his adept packaging of concepts from other retention theorists into a comprehensive theory. He helped make this case with his willingness to update his theory as new retention theories became available. Overlaying an amalgam of different retention theories with Van Gennep's rites of package also provided an elegant solution for Tinto to smooth out differences between retention theories. Noting the "rituals and ceremonies" that accompanied stages in the rites of passage bolstered Tinto's argument that a student's perception of integration was more important than the integration itself. The need for rituals and ceremonies also helped clarify the institution's role in shaping that perception, particularly during the first year of college. While Tinto succeeded in describing mainstream the mainstream culture of higher education, critics worried that he did less well in addressing students outside that mainstream.

Supporters and Critics of Tinto

Braxton, Hirschy & McClendon (2004) examined Tinto's model, and maintained that 775 citations of Tinto conferred paradigmatic status. This status has understandably drawn its share of critics, and, before using it, we should question its assumptions and conclusions. Braxton & Lee (2005) found Tinto's model generated 13 testable propositions for residential institutions and 13 for commuter institutions.

To test reliability, Braxton & Lee (2005) identified studies using multivariate statistical tests of Tinto's model. For residential institutions, only five of 13 propositions were supported, those related to social integration. For commuter institutions, none were supported. From this review of research studies, Braxton & Lee (2005) recommend mandatory orientation programs and on-campus living for first-year students in order to build social integration. Braxton & Lee's findings demonstrate even paradigmatic theories like Tinto's may generate mixed and contradictory research findings.

In particular, Tinto has received strong criticism regarding his interpretation of the separation stage. Tierney (1992) argued that Tinto's use of Van-Gennep to explain movement within cultures proved inadequate to describe the challenge minority students faced moving from one culture, outside the institution, to the new culture within academia. Tierney additionally worried that dissociation from their own cultures disadvantaged minority students, while such dissociation did not contribute to minority students' eventual persistence, and that such findings might "hold potentially harmful consequences for racial and ethnic minorities" (Tierney, 1992, p. 603). Instead, Tinto reduced minorities, women, adult students, and honor students to the term, "different", demonstrating Tinto's original 1975 endorsement of "typical" as white, traditional-aged, and male (Tierney).

Even as Tinto (1975) responded that there was too little information to support correlating race and attrition at the time his original works were written, and argued for disaggregation in order to identify individual characteristics (Tinto, 1993), his writings too frequently cast retention as conformity, dismissed the unique challenges of minority

and disadvantaged students, and characterized institutional action and socialization as uniformly positive.

Students and parents are sensitive to increases in price and aid, but for minorities in particular, their response to different categories of cost or aid can run counter to institutional assumptions and policies (Fitzgerald & Delaney, 2002). Students and their families are confused by the types of aid and the requirements for applying for it (Dowd, 2006). They are also fearful of the significant borrowing required for higher education (Dowd), particularly if the families had no previous participation in higher education. Compounding the problem, students of lower socioeconomic status have less access to financial aid information than more affluent students (Fitzgerald & Delaney).

As Deborah Stone (2002) would caution, institutional policy is socially constructed, as such reflecting value judgments and assumptions of rationality that, by their nature, reward some and penalize others. This is not meant to suggest that Tinto or traditional retention research in general is invalid, rather that a critical study of student departure requires consideration of alternate viewpoints and examination of minority and underclass interests, particularly in the area of finances.

Becker's Student as Rational Consumer

Gary Becker's (1993) study of the economics of higher education finds an eleven to thirteen percent average rate of return from degree completion, but limits that finding to urban, white males. Becker (1993) refers to education and training as the most important investment that can be made in' "human capital", thus referring to the potential individuals have for retaining and increasing their own value. Becker (1993) recognizes his model may hint at exploitation, but a concept like human capital provides a necessary

foundation for doing a rigorous cost-benefit analysis such as that suggested by Tinto (1993).

Becker (1993, p. 91) claims that "an informed, rational person would invest only if the expected rate of return were greater than the sum of the interest rates of riskless assets and liquidity and risk premiums associated with the asset." As Becker (1993) continues, human capital, not easily converted to value on the job market, is quite illiquid and risky, and its return depends on unique and individual factors, like age and ability and, one could infer from his writings, gender and ethnicity.

Bourdieu, Cultural Capital, and Habitus

Bourdieu's (2001) concept of cultural capital expands on Becker's findings. He suggests cultural capital can be found in individuals (human capital), in books, or in institutions of higher education (Bourdieu). Like all capital, cultural capital represents labor and property value, takes time to accumulate, and can be converted into economic capital, or profit (Bourdieu). Bourdieu recognizes the value of education, but tells us those with money are better able to acquire education and extract more value from it. Because they are able to purchase free time for themselves or their children, families with more resources acquire an education as early and quickly as possible. Applying Becker (1993), they therefore decrease their costs and increase their potential return.

The additional resources held by families who retain cultural capital also allow their children to participate in social networks leveraging the cultural capital acquired from higher education (Bourdieu, 2001). Institutions of higher education create and support these social networks through formal recognition of the groups, but also by informally reinforcing the structure of the groups (Bourdieu). Bourdieu also identifies

habitus, collective habits passed down from parents and peers as unquestioned values and norms, as advantages for those with resources and disadvantages for those who lack them. Bourdieu suggests these values and norms of one's social class shape beliefs and patterns, thereby limiting free will and predetermining choices.

Simon's (1976) theories support Bourdieu's concept of habitus, postulating that people rarely achieve optimal solutions since they do not have perfect information. Instead, when confronted by alternatives with uncertain outcomes, and, when they have inadequate knowledge of the subject area, we use rules of thumb or heuristics (Simon) achieving satisficing solutions; solutions which we consider good enough under the circumstances. Simon terms this bounded rationality; bounded that is by the environment surrounding the problem, inadequate information about the problems or solutions, and our internal limits on our capacity to manipulate information in order to achieve an optimal solution. Bourdieu (2001) suggests that habitus makes up part of that boundary, predetermining certain outcomes. Additionally, during the recruiting process, an institution provides a narrow range of information focusing on their own tuition and fees and financial aid relevant to those costs, but not the quantity and quality of comparable information about other institutions needed to inform an optimal economic choice.

Discussion and a Proposed Theoretical Model

The major theorists start with Spady's (1970) simple framework for retention study. Students bring their pre-college characteristics to an institution of higher education, internal characteristics like their values and external ones like friends and family. Once there, the institution and its community provide tangible and intangible support. If the student perceives that support as sufficient, the student stays (Pascarella &

Terenzini, 1979). If not, the student leaves. Spady's simple framework is useful, particularly in outlining the broad concepts and processes. As critics of Spady suggest however, a student's pre-college characteristics are easier to operationalize than intangibles like institutional support (Berger & Braxton, 1998).

Astin (1997) makes an effort to clarify the institution's contribution pointing to its policies, procedures and curriculum. He cautions however that the college community's positive effect on a student's persistence can be offset by external influences like friends or family, arguing for more student involvement through measures such as on-campus residence. This is more easily operationalized and tested, but it also introduces the idea of time as a resource contributing to student success, for Astin (1997), the most valuable student resource.

Astin (1970) also advocated for multi-institutional research in his input-environment-output model, noting students attend more than one institution of higher education, and retention research needed to follow their persistence as they transferred between institutions. This overlooks how a student's finances may be negatively affected by such a transfer. Becker's (1993) study found an eleven to thirteen percent return on higher education. A transfer from one institution to another can increase a student's costs in money terms and time to degree, which could significantly decrease Becker's return.

Bean's (1985) organizational approach echoed Spady's and Astin's models starting with pre-college characteristics identified by Bean as background variables, and academic and environmental variables supplied by the institution and external environment. The resulting academic and psychological outcomes, would affect intent to leave, thereby actual persistence or dropout. Bean's concepts of social integration and

intent to leave, preceding dropout, overlay Spady's perception of sufficiency while providing measurable variables which Spady did not provide, most importantly for purposes of this research, those regarding finances.

Tinto so successfully incorporated the theories of his predecessors that his model may be considered a meta-theory (Braxton, Hirschy, & McClendon; 2004). Tinto used Spady's framework and found Bean's organizational mindset helpful. Like Astin, he also cited the importance of an institution's policies and practices, noting that the success of a student could hinge on how the institution communicated them to its students. His extension of Van Gennep's ritual and ceremony to student integration helped clarify the role of higher education's traditions in that communication and its beneficial effect on student persistence. Part of the attraction of Tinto's model to retention authors and practitioners is his willingness to revise and add to his model in response to new information.

Tinto (1993) noted that financial aid may be more important for under-represented groups, but then added that financial aid would give disadvantaged students the same opportunities to persist as others (Tinto). He went on to say, "Individual decisions about persistence are no different in substance that any other economic decision which weighs the costs and benefits of alternative ways of investing one's scarce economic resources," (Tinto, 1993, p. 87). Tinto's easy dismissal of student finances provides impetus for a greater consideration of student finances and departure in this study.

Most research on the effects of financial issues on retention has focused on financial aid. Tinto's early retention research in 1975, as a graduate student, informed a

federal government report on how to adjust financial aid policies to increase persistence (Spann, 1990). In that research, Tinto (1975) advanced a cost-benefit theory to explain that a student departed the institution if an alternate investment of time, money and energy would provide a greater return than staying in college.

Tinto's perspective on finances parallels that in Becker's (1993) landmark study on the return of higher education. Though more specific, Becker's (1993) findings are at once problematic to apply because they support an average return of thirteen to fifteen percent and are limited to urban, white, males. If we draw on Bourdieu (2001) however, families with more money can acquire education more quickly, at a lower cost, and extract more value from it, distorting Becker's average return. Moreover, institutions of higher education create and support social networks which propagate this phenomenon. While we cannot be sure that white males are part of the advantaged class Bourdieu refers to, the significantly lower retention rate for minorities would suggest this to be true.

Tinto (1987) would later add financial resources as part of the set of background characteristics to be considered in persistence, however he would consistently argue that the effect of financial issues were largely indirect and short-term and played their role in the students' selection of an institution, but ceased once they began their education (St. John et al., 2000). As further support, Tinto cited Murdock's (1987) meta-analysis of more than 50 studies, finding a minimal effect of financial aid on persistence. Tinto concluded from the above that financial issues did not contribute to persistence for most students (Tinto, 1993). Reinforcing his point, Tinto castigated exit surveys to the contrary as "ex-post facto rationalization" (Tinto, 1993, p 66).

Admittedly, research on the effect of financial aid on student persistence has produced mixed results. Some studies show increased persistence, while others show no relationship or are inconclusive. Still others suggest financial aid decreases student persistence (Braunstein, McGrath, & Pescatrice, 2001). Part of the problem with assessing the impact of financial aid is that it depends on policies in place at a given point in time (Dresch, 1975), while financial aid offerings, policies and requirements change on an annual basis (Heller, 2003b). The receipt of financial aid can also affect other variables which affect persistence, including student psychology, social integration, and intent to persist (Cabrera, Castaneda, Nora, & Hengler, 1992).

St. John, et al. (2000) suggest in a proposed nexus model a more complex model of student behavior considering how direct and indirect effects financial issues and students' perceived ability to pay may impact departure. The model begins with entry into higher education, Cope & Hannah (1975, p. 55) noting "poor college choice and pre-entry expectations" could account for up to 20% of student departure. Presaging Simon (1976), Cope & Hannah go on to say that entering students do not receive enough information to make good choices. Cope & Hannah further argue that much of the information students do receive is misleading, at minimum focusing on one institution rather than the range of choices in the higher education market. This suggests the following as a way to describe student financial behavior before and during the first year leading to departure.

Becker, (1993), in simple terms, tells us a student attends a college or university with the expectation that the benefits will exceed the costs: A student will drop out when the converse is true, the costs exceeding said benefits (Becker, 1993; Tinto, 1993). While

this is theoretically accurate, it does not convey the situation of a student with financial problems. For that student, it does not matter whether an investment in higher education is viable if there are no funds to invest. That student has a cash flow problem, not an investment problem.

Students and their parents' expectations of costs and resources are not the same before the student attends their first year as during the first year. This is another way of saying that the actual costs do not meet the students' and parents' financial plans and expectations.

The information students and their parents with resources receive before the first year of higher education, and their ability to process and act on this information, i.e. the plan for the school year makes their perception of costs and resources before the year approach the actual costs and resources during the first year of higher education.

Cope and Hannah (1975) suggest students and their parents at financial risk receive less and poorer quality information before students attend the first year of higher education, and cannot process and act on this information. As a result, their expectations of costs and resources do not approach the actual costs and resources until during the first year of higher education.

The resulting decision is not an optimal decision. It is instead a satisficing decision (Simon, 1976). Becker's (1993) rational higher education consumer with benefits exceeding costs does not describe student dropout behavior. Instead, the student perceives that the costs of the first year of higher education exceed the benefits of the future degree, thus departing.

The above logic is summarized in the following model:

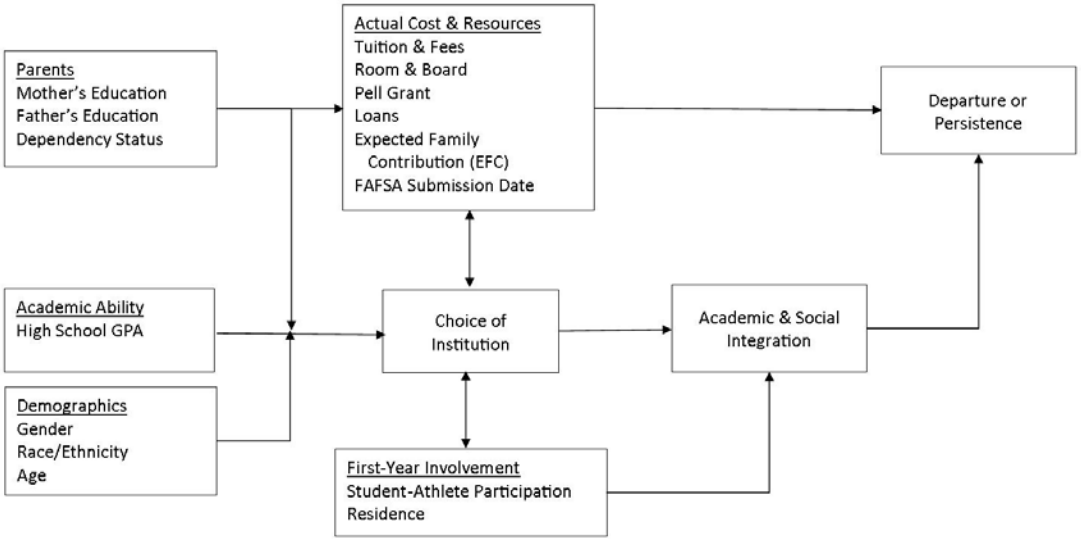

Figure 5. Suggested model of student departure for financial reasons.

Research Questions and Hypotheses

Research Questions

The following research questions guide the research.

Research question 1. Do financial characteristics predict departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students from a rural masters-granting state institution of higher education during the first year?

Research question 2. If financial characteristics do predict first-year departure, do the results differ for different races, ethnicities, or other underserved groups?

Hypotheses

Hypothesis 1. Financial characteristics are significantly correlated with the departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students during their first year.

Hypothesis 2. Financial characteristics of full-time, first-time-in-college (FTIC), first-year baccalaureate-seeking differ significantly in how they predict departure of students depending on the race or ethnicity of the student.

Summary

This chapter reviewed the work major theorists in college student retention. It began with Spady's sufficiency theory drawing on Durkeheim's early sociological studies of suicide. Therein, Spady noted that student must perceive themselves to be sufficiently integrated within the institution of higher education in order to persist. Bean than applied a human resources model to persistence in order to clarify the mechanism of student adaptation and coping behavior which allowed that integration to take place. Astin noted that student coping behavior took places in an environment where institutional and external forces battled for the student's attention. Astin recommended that the institution encourage more student involvement to increase persistence. Terinzini and Pascarella noted that institutional strategies motivating student persistence were most effective in the first year of college study, and many institutions adopted that thinking front-loading retention programs in the first year.

Tinto incorporated the work of all the previous researchers into a meta-theory. He then expanded on their work by overlaying Van Gannep's concept of rites of passage, recognizing definable stages of separation, adaptation and adopting new norm, and either integration with the institution and successful persistence or departure. For Tinto, as for Spady, it was not the integration which led to persistence, but a student's perception of integration in the face of the stressors of transition, which would lead to persistence. This process is particular important during the first year of a student's college experience.

Many recognized the paradigmatic status of Tinto's research, however critics like Braxton and Lee suggested that not all of his theories could be borne out through statistical testing, just those related to social integration. Others suggested that his theories did not apply as well to minority students who were making the college transition outside the framework and support of the majority culture.

This dissertation questions whether a student's insufficient resources also fall outside the framework and support of the majority culture leading to persistence. Tinto and Becker use the concept of the rational consumer of higher education, with full and equal access to cost and benefit information to suggest that all financial decisions are made before a student matriculates. As a result, they assert that finances play no part in a student's decision to depart. This is countered by Bourdieu who maintains that the cost and benefits accruing to students depend on their habitus, norms and values associated with their social class. Simon's perspective agrees with this, suggesting that people make "satisficing", less-than-optimal decisions based on the imperfect information available to them.

St. John, Cabrera, Nora and Asher suggest an alternative to Tinto and Becker locating departure for financial reasons at the decision point during the first year where the student consumer recognizes more fully the costs of higher education and the inability to meet those costs with available resources. This theory provides the foundation for the model of college student persistence/departure incorporating financial characteristics used in this dissertation. It also underlies the assertion in the related research question and hypotheses that financial characteristics can be used to predict the departure of first-

year students. The next chapter on methods shows how the research variables are operationalized based on the model, definitions, and hypotheses.

CHAPTER III

METHODOLOGY

Introduction

In the preceding chapter, the literature review cited key authors on college student departure and retention, leading into a discussion and model of the impact of financial issues on first-year departure. The chapter ended with relevant research questions and hypotheses that challenged aspects of current research and a section that identified and defined the key terms and variables which could be used in a financial model. This chapter begins by restating the research questions and hypotheses, reviewing the methods used and the institutional setting, explaining how the research variables were operationalized, and articulating how the data were collected and analyzed. This chapter finishes with a discussion of validity and limitations.

Research Questions and Hypotheses

Research Questions

The following research questions guided the research:

Research question 1. Do financial characteristics predict departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students from a rural masters-granting state institution of higher education during the first year?

Research question 2. If financial characteristics do predict first-year departure, do the results differ for different races, ethnicities, or other underserved groups?

Hypotheses

The research questions generated the following hypotheses:

Hypothesis 1. Financial characteristics are significantly correlated with the departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students during their first year.

Hypothesis 2. The effects of financial characteristics among full-time, first-time-in-college (FTIC), first-year baccalaureate-seeking students on the departure of students vary depending upon the race or ethnicity of the student.

The research questions outlined in Chapter II asked whether financial characteristics lead to first-year departure. Financial characteristics are those related to the costs of a student attending an institution of higher education and the resources available to pay for those costs or the process for obtaining those resources. As indicated by the literature, non-financial characteristics, which contribute to retention or mitigate retention effects are also included. For example, participation in student athletics is typically understood as a non-financial characteristic, yet student-athletes may receive additional aid in the form of athletic scholarships and tutoring. This assistance may affect probability of their departure or increase the likelihood of departure.

Typically in the literature, departure is defined as departure from one institution, rather than departure from higher education overall. This is largely due to the fact that information about stop-outs or subsequent enrollment at another institution is was not systematically available. Thus while students may transfer to other institutions to continue their studies or achieve goals of self-discovery or maturation (Hagedorn, 2005), their departure may also reflect misspent time and money on the part of students and

parents, as well as the institution. Thus institutional retention is more widely researched and therefore, better understood (Hagedorn, 2005). It is also important, however, to study student behavior at the individual level.

Use of Quantitative Methods

Analysis of institutional quantitative secondary data can be used to examine a specific student population and develop a model of their behaviors and processes, as well as those of the institution. My research is applied, using categorical or numeric data from the student information system to predict departure with the intention that it may provide information for improving institutional policies and practices. Specifically, I used secondary data in the university's student information system to identify financial characteristics that may signal potential risk factors correlated with first-year students leaving the university before beginning their second year. However, as these secondary data also provided information on multiple characteristics of departing students, they can identify whether students would leave for financial or non-financial reasons.

Context and Characteristics of Site

The research site provided convenient access to the data. The researcher's existing familiarity with the institution, its policies and procedures provided valuable insight, which guided the research. The research involves a study of financial issues with two cohorts of students within the bounded context of the policies and practices of a single institution (Patton, 2002). This research is inherently limited because the research covers a single institution, although it can lend itself to guiding a closer study of student populations at other institutions.

Clarion University of Pennsylvania is a primarily residential, public, four-year, inclusive (Carnegie Foundation, 2011) university of 7,315 students (Clarion University of Pennsylvania Institutional Research, 2011), located in Clarion, a Borough of 5,276 residents (U.S. Census, 2010) in a rural area. Clarion University of Pennsylvania became part of the 14-university Pennsylvania State System of Higher Education (PASSHE) offering on-campus and on-line associate, bachelors, and masters degrees in 1985 (Clarion University of Pennsylvania Middle States Steering Committee, 2012). The student enrollment for the university can also be compared with national data for universities with similar characteristics and the other universities within its state system.

Key Terms and Variables

Writing about public policy, Deborah Stone (2002, p. 249) suggests we make policy decisions by what we choose to measure, because "the way we think about problems is extremely sensitive to the language used to describe them." The choice of key terms and their definition is not inconsequential. Tinto (1987) worried that the term "dropout" implied a student deficit. Adelman (2006), writing for the U.S. Department of Education, concurred that "dropouts" and "risk" were the language of failure. He (Adelman) noted that this kind of language turned students into patients needing diagnosis and intervention and suggested the alternative language of success and graduation.

Definitions can be problematic because they cannot cover every group of students or situations. Scholars who study student persistence or departure disagree whether the institutional or student perspective should guide research, and attribute different meanings to key terms. Given Stone's (2002) caution that our definitions and measures

include and exclude people, it follows that those excluded are not just excluded from study, but also from support through public policy and institutional attention. Thus attention to these implications guides choices made in this study.

The following definitions have been adapted from the National Center for Education Statistics (NCES) definitions for Integrated Postsecondary Education Data System (IPEDS) for enrollment reporting (U.S. Department of Education National Center for Education Statistics [NCES], 1998). They are consistently applied to all United States colleges and universities and as the most widely accepted system of measurement (Hagedorn, 2005). Where appropriate, authors are cited who have found support for these in their own theories and models.

Pre-College Characteristics – Family

While distinct, the characteristics of gender, race and ethnicity, age, marital status, dependency status, number in family, number in college, and educational level achieved by parents are related in that each separates those studied from the dominant culture of the white, traditional-aged, male student. Tierney (1992) and Bourdieu (2001) suggest some non-dominant groups may have more difficulty persisting. Tinto (1993) argued that Bean had not adequately considered student subcultures, while Tierney (1992) countered that Tinto had overlooked the challenges minority students faced in adapting to cultural changes at an institution of higher education.

Additionally, the characteristics appear to be intertwined in their impact on finances and the expectations of success in higher education. For example, married, Chicana mothers simultaneously seek higher education as a path to financial success, even as their traditional roles within their culture and families urged then not to (Gandara,

1994). Astin (1997) too, found that marriage enhanced the ability of men to persist in higher education while it appeared to decrease women's success. As these characteristics play a role in predicting departure or persistence in complex ways, they merit examination in this study as follows:

Mother's level of education/father's level of education. Being a first-generation college student generally reduced the chance of persistence even when controlling for other factors (Ishitani, 2003). This finding has been attributed to less encouragement and a diminished support system for first generation students than for others (Terenzini, Springer, Yeager Pascarella, & Nora; 1995). First generation students also responded differently to particular types of financial aid when compared with non-first generation students (Somers, Woodhouse, & Cofer, 2004). The data provided from Clarion's SIS were limited to summary categories for junior-high-school completion and below, greater than junior-high through high-school graduation, and college and beyond. I coded both education variables as follows: 0 = college and beyond; 1 = high school and below.

Dependent/independent student status. Dependent students are those under age 25, unmarried, without children whose parental income is considered for the purposes of aid (King, 2002). Independent students are students age 25 or older, married, with children whose own or spouses income is considered for the purposes of aid (King, 2002). Dependent students were coded as 0 and independent students as 1.

Number in family and number in college. As discussed above, this would have different effects on men and women and would have a different meaning for independent married students than for dependent single students. Generally however, as suggested

earlier, greater numbers of children would make involvement in and integration with the culture of the institution more difficult even as it increased the motivation for mobility (Gandara, 1994; Tierney, 1992). Number in family is coded as 0 if there are three or fewer members and 1 if there are four or more. Number in college is coded as 0 if there is one and 1 if there are two or more.

Gender. Gender was relatively straightforward in reporting and definition. This was used in models or cited as relevant by Bean (1985) and Tinto (1993). Female is coded as 0 and male as 1.

Race/ethnicity. The requirements for reporting race and ethnicity changed in recent years, particularly after 2010. The result was a number of students choosing to report as multi-ethnic, or not reporting at all. At Clarion University, American Indians/Alaskan Natives, Asian/Pacific Islanders, and Hispanics numbered less than ten respectively for both years. To assist in reporting and analysis, individual race and ethnicity was reported, but analysis was done on summed majority and minority categories. These were used in models or cited as relevant by Becker (1993), Bean (1985), Bourdieu (2001), Dowd (2006), Fitzgerald & Delaney (2002), Tierney (1992), and Tinto (1993). Race/ethnicity is coded as 0 if majority and 1 if minority.

Age. If age was requested, it could potentially differ for every entering first-year student. Colleges and universities more typically request the date of birth, which was the case with Clarion University. This was converted by the researcher to a standardized age by subtracting the freeze date of the fall semester of the first year, a formal date for finalizing and publicly reporting student information. This was used in models or cited

as relevant by Bean (1985) and Tinto (1993). Age is coded as 0 if 19 or older and 1 if 18 or younger.

Pre-College Characteristics – Student Academic Ability

Student scores on standardized tests, high school GPA's, and a student's high-school class rank are used as admission criteria because such indicators of high school ability have been shown to be correlated with successful completion of college work (Bean & Metzner, 1985; Reason, Terenzini, & Domingo, 2006). Astin (1993) suggests such indicators of high school ability reflect good study habits, which carry over from high school to college with high school GPA the most strongly related to success in college. However Astin (1997) and Tinto (1975) assert that these and other pre-college factors are predictors of college success, but not of persistence. They argue that the influence of the institution, its environment, and the student experiences or distractions from the experiences become more important once the student begins school (Pascarella & Terenzini, 1991; Tinto, 1993). Additionally, some research suggests standardized tests do not predict as well for students of color, older students, or other students for whom college reflects a shift from their cultural background (Hoffman & Lowitzki, 2005). Still, as current admissions criteria, they should be examined as predictors or controlling variables.

High school GPA. High school GPA was reported based on a scale from 1 to 4.5 and left as a ratio level variable.

High school rank/high school size. In order to standardize the high school ranks within the first-year cohort, each individual's GPA was divided by the size of the high school class data provided for each student.

Institutional Environment – Costs

Tinto (1993) and Becker (1993) hold that students make a rational economic decision purchasing higher education based on an analysis of costs versus benefits. Conceivably, the most straightforward part of this decision is the cost. Simon's (1976) research would suggest that students and their parents make sub-optimal decisions due to limited information. However, Bourdieu (2001) sees the matter as more complex than that. He argues instead that families with greater resources acquire education at decreased cost. He feels that such families are able to take advantage of norms and habits that work to their favor, such as parents, siblings, and peers who have already attended college. Moreover as with other aspects of higher education, perceptions and preferences of students and parents rather than actual costs may motivate the decision to persist or depart (Cabrera, Nora, & Castaneda; 1992)

Tuition and fees. This includes tuition and fees that are summed together for students. Generally, a state-funded institution has less flexibility to change tuition and fees from year to year due to state oversight and approval. For the same reasons there is little variability in tuition and fees from student to student. This variable was measured as a ratio level variable.

Room and board. The room and board rates set by an institution will vary per student. State governments not only allow this, but even mandate that public-funded institutions of higher educations charge fees at levels sufficient to cover all costs of additional amenities. This position ensures that taxpayers do not subsidize these costs for students. The economic cost-benefit decision mentioned by Tinto (1993) and Becker (1993) addresses the cost of these amenities as relates to financial aid and loans. The

decision about room and board involves which amenities are considered necessary for an effective education. When a student attends a residential campus like Clarion University, they have already made the decision that a residence is necessary to support their education, as recommended by Astin (1997) and others. The decision of which amenities to include is made within that bounded environment (Simon, 1976). This variable is coded as a ratio level variable.

All costs. In order to facilitate analysis, tuition, fees, and room and board are summed into one figure for each student. It is, therefore, a ratio level variable.

Net costs. The total cost figure is netted against all forms of aid to determine a net cost figure. This is a key factor in the economic student decision highlighted by Becker (1993) and Tinto (1993). It is coded as a ratio level variable.

Institutional Environment – Resources

Financial aid can include grants, scholarships, waivers, loans and work study, each of which have different effects on students of different ethnicities, backgrounds and income levels (Dowd, 2006; Fitzgerald & Delaney, 2002; Paulson & St. John, 2002; Tinto, 1993). Thus, as college costs increase relative to income and the college-going population becomes more diversified, having a variety of financial aid options becomes increasingly important (Heller, 2003a), particularly for under-represented groups (Tinto, 1993). This highlights the need for disaggregation of retention data to facilitate better understanding of how variables like financial aid affect different groups of students (Tinto).

Pell grant. Pell grants are need-based aid provided to low-income students based on the families Expected Family Contribution (EFC), the cost of attending the institution,

whether a student attends full- or part-time, and whether the student attends for a full year or less. This variable is measured at the ratio level.

Pell-eligible. Because Pell grants are need-based and provided to low-income students, Pell-eligible (eligible for Pell Grants) has become synonymous with low-income in peer-reviewed research studies (U.S. Department of Education Federal Pell Grant Program, 2013). This variable is measured at the ratio level**.**

Loans. This is a summary category for a number of need-based and non-need-based federal, state and private student loans for education made to students or parents on the student's behalf. It is measured at the ratio level.

Scholarships and grants. This is a summary category for a number of need-based and non-need-based federal, state, and private student scholarships and grants available to students and is measured at the ratio level.

Expected family contribution (EFC). This variable is a measure of a student's family financial health calculated based on the Free Application for Federal Student Aid (FAFSA) information submitted by the student input into a federal aid formula. The EFC is used by an institution and the federal and state governments to determine a student's eligibility for financial aid (Federal Student Aid, 2013a) and is measured at the ratio level.

Free application for federal student aid (FAFSA). Free Application for Federal Student Aid must be completed by college/university students in order to receive federal and state financial aid, and often to receive private financial aid as well (Federal Student Aid, 2013b).

FAFSA submission date. The FAFSA can be submitted to the federal website between January 1 and June 30 of the year of attendance. Institutions have their own deadlines commencing shortly after the January submission date. The first-come, first-serve nature of the FAFSA makes the submission date critical (Federal Student Aid, 2013b). This variable is coded as 1 (submitted January 1) to 181, representing the number of days to submission.

Financial plan. This variable represents a systematic effort by a first-time-in-college/university (FTIC), degree- or certificate-seeking first-year student or family member of the student to project the costs of higher education. These planned costs are matched with potential sources of funds (Paulson & St. John, 2002; Lippman, Guzman, Dombrowski, Kinukawa, Schwalb, & Tice, 2008) with or without an assessment of the future return on the investment of these funds (Becker, 1993). This variable is measured at the ratio level.

Financial issues. This variable reflects issues of cost and funding for first-year students. It includes tuition and fees and annual rates of increase and the breakdown in financial assistance between grants, scholarships and loans. It additionally includes the relationship of family income to net costs of higher education, on- and off-campus work and other costs that facilitate or reduce the ability to participate in the educational experience (Schuh, 2005). It is measured at the ratio level.

Institutional Environment – Involvement

Several elements that constitute student involvement have been linked to persistence. For example, the importance of residence is most closely associated with Astin's (1985) student involvement model. As the model suggests, students living on

campus have more time for studying, college activities, and interaction with faculty. For the same reason , Astin recommends on-campus employment as conducive to persistence. Further, some research has found formal athletic participation to be detrimental to student persistence (Hollis, 2001). However some aspects of it, such as shared-on-campus residence, tutoring sessions and practices can also raise the average GPA of student-athletes above that of the student body at large. This therefore should also be reviewed when considering involvement and persistence.

Student-athlete participation. This variable denotes receiving funding or reduction in tuition, fee, room or board cost because of participation in university-sanctioned athletics. Athletic participation is coded as 0 for yes and 1 for no athletic participation.

Residence. This variable assesses whether the student is living in university- or university-affiliated organization funded housing. It is coded as 0 to represent university residence and 1 to indicate non-university housing.

University employment/work-study. This variable indicates a student's total funding eligibility under a university work-study program. It is coded as a ratio level variable. There were few receiving work-study funding so it was not a good candidate for analysis.

Institutional Comparison With System-Wide and National Data

These comparison data are available publicly on-line in the Integrated Postsecondary Education Data System (IPEDS) through the National Center for Education Statistics (NCES). The IPEDS data center provides tools to aggregate data

nationally and for the Pennsylvania State System of Higher Education of which Clarion University is a part.

Comparison by Gender

The average first-year, full-time, degree-seeking enrollment by gender shows overall enrollment nationally fluctuating yearly but slowly increasing from 2005 to the current year for both men and women. The 13 universities besides Clarion making up the Pennsylvania State System (PASSHE) also show a relatively level enrollment that increases slightly for both men and women until 2011, then decreases slightly for both genders to about the 2005 levels in 2014.

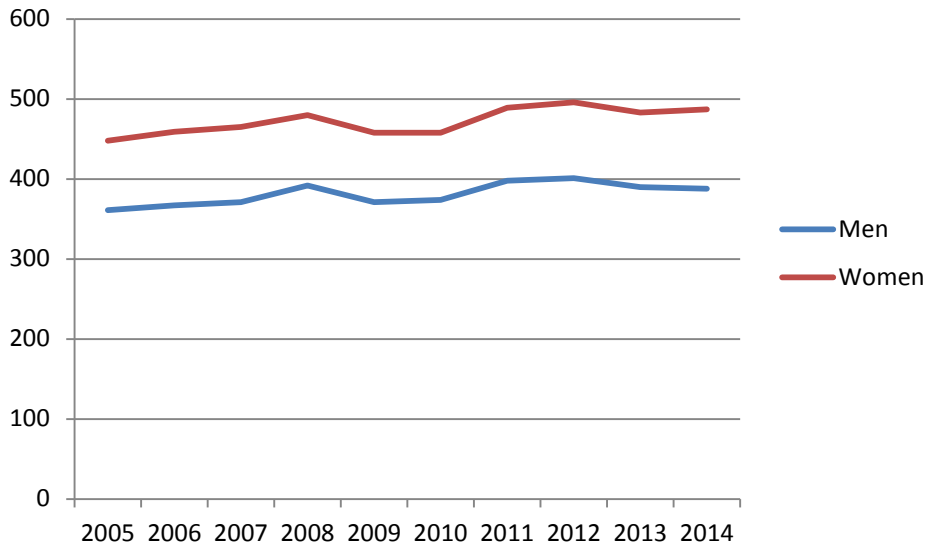

Figure 6. National 10-year average enrollment by gender.
(U.S. Department of Education National Center for Education Statistics Institutional Postsecondary Education Data System [NCES-IPEDS], 2014).

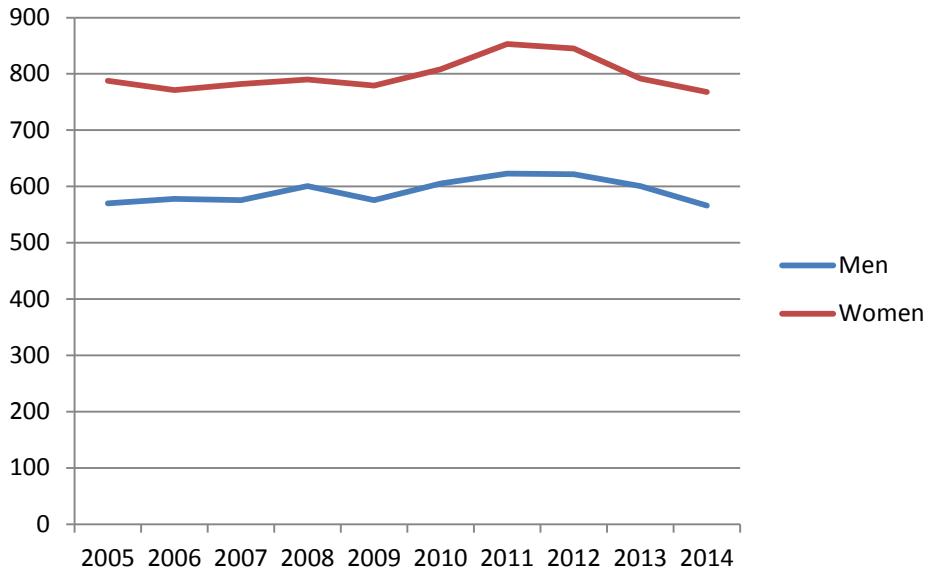

Figure 7. PASSHE 10-year average enrollment by gender. (NCES-IPEDS, 2014).

Clarion University shows fluctuations in enrollment for both men and women, however, enrollment drops consistently each year from 2010 onward for women, and from 2008 onward for men. In percentage terms, male enrollment decreased by 35% from 2008 through 2014 and female enrollment by 27% over the same period.

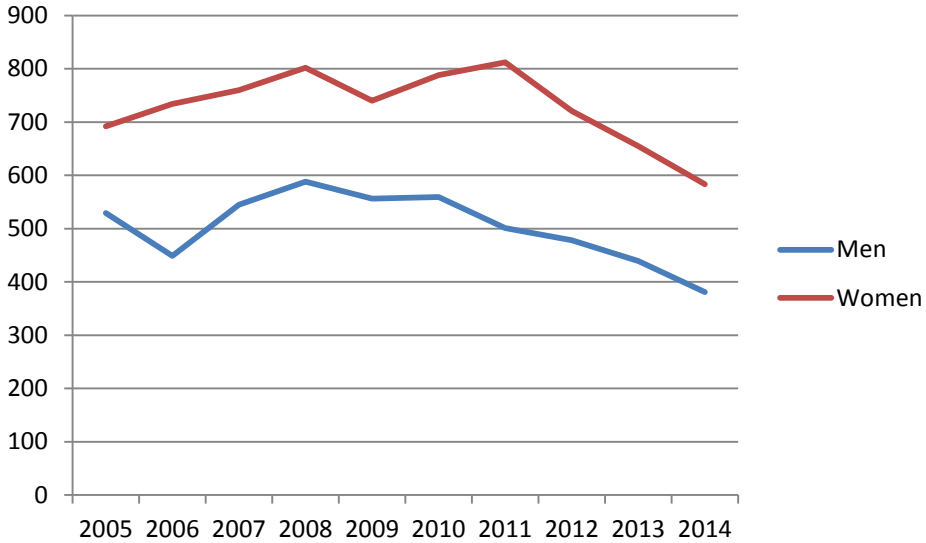

Figure 8. Clarion University 10- year average enrollment by gender. (NCES-IPEDS, 2014).

Comparison by Race/Ethnicity

There is a similar relationship between national and PASSHE first-year, full-time, degree seeking enrollment when race and ethnicity are examined. Here the minority student enrollment increases slightly each year from 2005 through 2014. Majority enrollment increases slightly, then drops back to near 2005 levels. This downturn in majority enrollment occurs in 2010 for both PASSHE and when compared to national data.

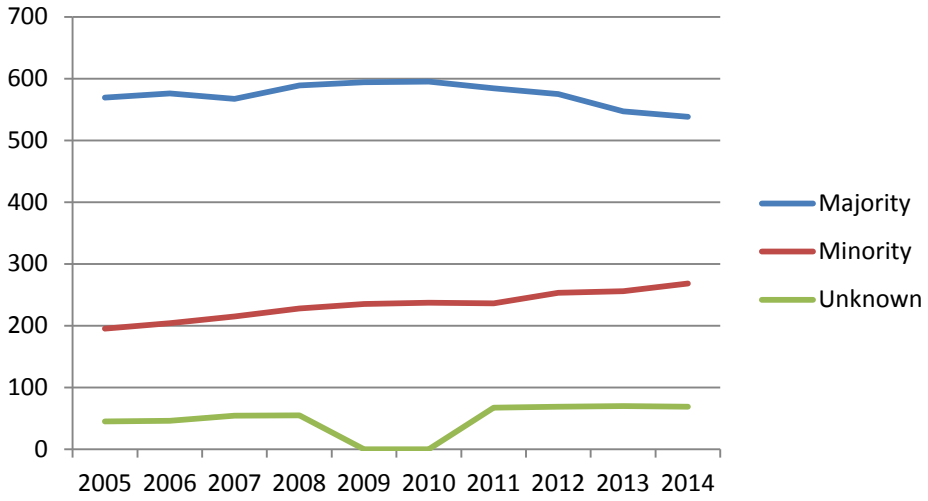

Figure 9. National 10-year average enrollment by race/ethnicity. (NCES-IPEDS, 2014).

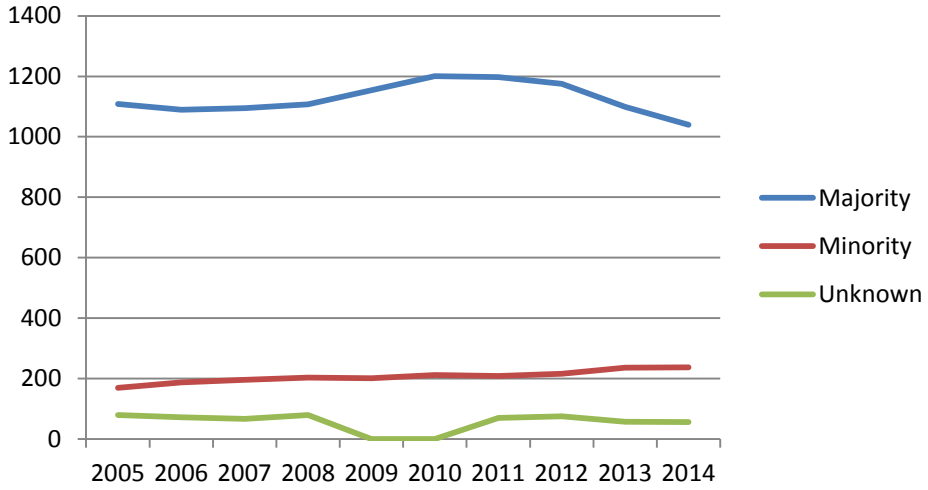

Figure 10. PASSHE 10- year average enrollment by race/ethnicity. (NCES-IPEDS, 2014).

For Clarion University minority enrollment remains level from 2005 through 2014. Majority enrollment decreases noticeably from 2008 onward except for a slight uptick in 2010. The result is a 37% decrease in majority enrollment as a share of total enrollment from 2008 through 2014. This is potentially problematic insofar as these students, making up a large segment of Clarion University's traditional enrollment base, have chosen not to apply or enroll at Clarion University.

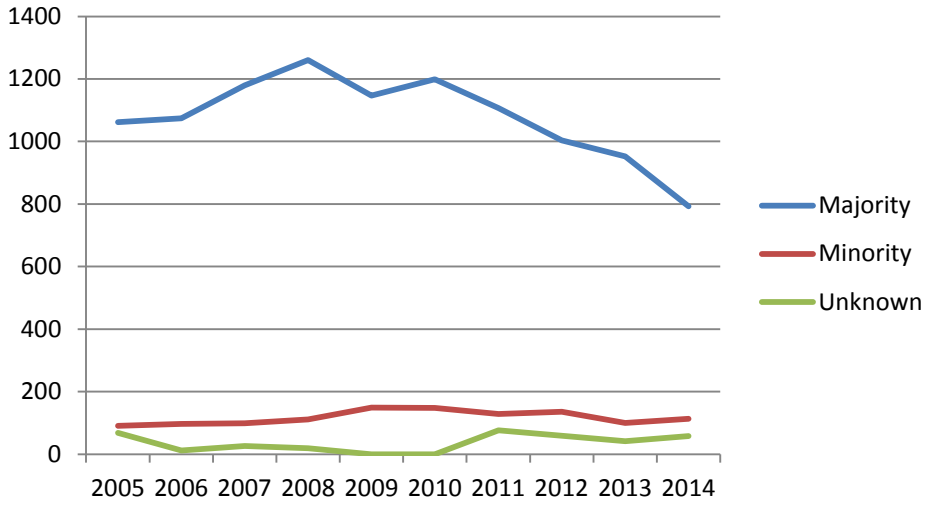

Figure 11. Clarion University 10- year average enrollment by race/ethnicity. (NCES-IPEDS, 2014).

From this demographic institutional context the study can turn to definitions for the variables that are the major focus. Earlier in this chapter I indicated how each variable was specifically coded. The following discussion provides greater clarity regarding the specific

sources of data.

Quantitative Variables

The secondary data used to generate variables can be grouped into three categories: admissions, finance, and control variables. Students' names and IDs provided identification information supporting cross-referencing students among the various data sources. For purposes of this study, a separate proxy ID number was substituted for the student ID by a university official. This kept the identity of the student anonymous to the researcher.

In the admissions category students' independent or dependent status indicates whether the parental resources or student resources would be used to estimate financial aid eligibility and qualification for in-state status. The students' admission status facilitated limiting this research to only full-time, first-year, first-time-in-college, baccalaureate-seeking students.

Clarion University of Pennsylvania's student accounts office uses the admissions information to assess tuition and fees for each student. The tuition and fee information is then listed in students' financial records, as the financial aid office does not collect its own information. Rather, they download data submitted as part of the Federal Department of Education's "Free Application for Federal Student Aid (FAFSA)". In providing these data to institutions of higher education, the federal government provides a coordinated and verified source of information and ensuring that financial aid reaches eligible recipients.

The FAFSA requests data from the most recent tax return to include type of tax return filed, adjusted gross income, tax paid, exemptions, student's and spouse's earned income from work, and net worth from various investments. Similar data are requested

from parents' tax returns. All students are also asked to provide information on the mother's and father's level of education.

For dependent students, the FAFSA also requests the total number of family members and the number of those family members in college. It then requests that students identify institutions of higher education that will receive their financial aid information. The student also indicate their choice of housing and full- or part-time enrollment status. This, as well as the completion date of the FAFSA, provides useful data.

The U.S. Department of Education and the University's financial aid office provides additional data after assessment of the students' qualifications for aid. These data included the total amount of financial aid required, specific grants and loan amounts awarded and the expected family contribution.

While much of the FAFSA/Financial Aid information is useful to this study, the most relevant data for the purposes of this research include family or student income, number of family members and family members in college, FAFSA completion date, grant aid, loan aid, and total aid, as well as work study qualified limit and expected family contribution. Data are collected on the FAFSA for both students and parents.

The proposed theoretical model derived from St. John, Cabrera, Nora, & Asher's (2000) three-stage nexus economic model provides a useful context for aligning the secondary data collected with research questions. Cope and Hannah (1975) suggest that students and their parents estimate their costs and financial aid prior to enrolling in the first year of higher education. The student chooses a specific college or university based

on an assessment of costs, financial assistance and potential benefits from that particular institution (St. John, et al).

Here the proposed model diverges from the rational consumer model (Becker, 1993; Tinto, 1993) as it suggests that students and parents balance costs against resources, rather than potential benefits, prior to the first year of attendance. Additionally the institution provides a bill for actual academic costs and the allotment for financial aid. The financial aid is subtracted from costs to detail the expected family contribution.

The type of financial assistance provided is important, in that grants, institutional grants, work-study and loans all affect persistence differently (Heller, 2003). The amount of each type of aid can also impact persistence (King, 2002; Jensen, 1981). Regardless of the cost or amount of aid though, low-income students are more likely to depart than higher income students (Baum & Payea, 2003; Heller, 2003a). One reason for this difference is that poorer students have a relatively higher expected family contribution compared with well-off students (Baum & Payea). While work-study assistance is positively associated with persistence overall, it negatively impacts persistence when the number of hours worked exceeds fifteen (King, 2002). King also notes that family size and independent/dependent student status can affect persistence, with independent students with children more likely to depart.

An early predictor of departure for financial reasons comes from FAFSA records. Completing a FAFSA and the timing of this completion marks a student's ability to plan for financing higher education as FAFSA decisions reflect preconceptions about availability of financial aid. A student's accounts receivable/billing record also provides an additional predictor in the form of late fees assessed.

In addition to the predictor variables suggested above, St. John, Cabrera, Nora, & Asher (2000) and Dowd (2004) recommend an appropriate set of control variables to account for omitted variables, co-linearity and self-selection. Control variables would include marital status, age, gender, race and ethnicity (Paulsen & St. John, 2002; Dowd, 2004). Additionally, the student's high school attended (St. John, et al), high school GPA and SAT score (Paulsen & St. John, 2002) and mother's educational level (Dowd) are suggested for control purposes, although the student's pre-college financial characteristics may have an impact on or be impacted by all of these. Though they are not pre-college characteristics, intercollegiate athletic participation and on-campus/off-campus residency are also controlled for because of their impact on finances. The outcome variables specific to this research are first-to-second year student departure and balance owed to the institution at the end of the first year.

Data Collection

Quantitative data were collected from Clarion University's student information system (SIS), a secondary data source that included both data that supported non-financial variables used in current retention theories as well as data used for financial variables. This data set can then be used to examine whether financial issues play a part in college departure. The student data feeding each student's records come from a number of sources and university offices.

For purposes of this study, the student ID was replaced by a separate identification number assigned by a university official to keep the identity of the student anonymous in the data extract provided to the researcher. Before the data set was analyzed, it was checked for missing records and elements of records. These records

were further investigated for systematic gaps in the missing elements that may skew the research.

The researcher's coding was based on data descriptions and definitions provided by the university and were consistent with common data set definitions used by most institutions of institutions of higher education in the United States. When categorical variables resulted in less than 10 cases for specific categories, the values were consolidated to provide meaningful results and facilitate analysis. I show the variables and how they were coded in Table 1.

Table 1

Variables and Coding

Variable	Data Type	Range or Code
Departure	Categorical	0 = Persist 1 = Depart
Gender	Categorical	0 = Female 1 = Male
Race/Ethnicity	Categorical	0 = Majority 1 = Minority
Age	Categorical	0 = 19 and Older 1 = 18 and Younger
Marital Status	Categorical	0 = Married 1 = Single
Dependency Status	Categorical	0 = Dependent 1 = Independent
Number in Family	Categorical	0 = Three or Fewer 1 = Four or More
Family Members Attending College	Categorical	0 = One 1 = Two or More
Mother's Education	Categorical	0 = College and Beyond 1 = High School and Below
Father's Education	Categorical	0 = College and Beyond 1 = High School and Below
High School GPA (of Student)	Continuous	
Student Athletic Participation	Categorical	0 = Athletic Participation 1 = No Athletic Participation
Residence	Categorical	0 = University Housing 1 = Non-University Housing
Tuition and Related Fees	Continuous	
Room and Board	Continuous	
Pell Eligibility	Continuous	
Work-Study Eligibility	Continuous	
Student Loans	Continuous	
Scholarships and Grants	Continuous	
Expected Family Contribution	Continuous	
FAFSA Submission Date	Continuous	

Data Analysis

Representative samples were entered into a spreadsheet to allow visualization of the logic and model of the variables before proceeding with further analysis. Descriptive statistics were calculated to assess relationships, illustrate anomalies, and consider the distributions of variables. The data for all first-year students were then entered into a statistical program for analysis.

First-year students were crosschecked against total enrollment, first-year full-time students, and finally against first-year, full-time, baccalaureate-seeking students to ensure the target population was representative of the other student populations and to explain differences.

Univariate analyses were completed, computing frequencies and scatterplots for each variable. Measures of central tendency as well as standard deviations, kurtosis, and skewness for each of the continuous variables were also calculated, as were the bivariate correlations of all the dummy and continuous variables.

Persisters were coded 1 and dropouts 0. Volkwein, Szelest, Cabrera, & Napierski-Pranci (1998) recommend logistic regression as preferable to other methods in analyzing dichotomous variables. Thus, logistic regression was used to conduct the multivariate analyses to test my hypotheses. Ordinary least squares multiple regressions were computed to obtain tolerances and variance inflation factors (VIFs) to check for evidence of multicollinearity. In the OLS multiple regressions and the logistic regressions, the outcome variable of persistence was regressed on the pre-college control variables (entered as a block in step 1), student involvement (entered as block 2), and the financial characteristics (entered as a block in step 3). Separate multivariate models were created

for each cohort (2010 and 2011). Significance levels were examined as well as the Wald statistics, and odds ratios to assess the impact of specific variables in the models. The log likelihoods and pseudo R-squares were examined for each block and the overall models to determine whether each block of variables were significant and important and to assess the overall model. The classification table and sensitivity and specificity of each model was examined to determine how well the models predicted departure.

Validity

A population includes some members and excludes others; in regard to a higher education population they may be based on the date or conditions under which students were admitted, for instance. Background information on the criteria for inclusion and exclusion for Clarion University of Pennsylvania was provided. This information will assist in assessing the external validity of these findings. Formal regulations, guidebooks, and other criteria which govern data entry and reporting were also reviewed and referenced to explain data entry specifics. This helped assess the operational validity and reliability of my measures.

By definition, secondary data are collected for a different purpose than that of the research. Accordingly, bias or other error could be introduced because the data entry or self-report were different from that intended by the researcher (Mertens, 2005). Data may be entered by different individuals under different sets of rules or criteria. Where possible, situations which may have introduced the potential for such inconsistencies were documented. Data in university files are regularly audited and scrubbed before submission to external governing and accrediting agencies. Data “owners” were

consulted for possible variations in coding and missing elements and for maintaining consistency in resolving interpretation issues and dealing with missing data.

Planning for costs, benefits, and resources, making application for funding and being timely in application constitutes a reasonable response whether buying a home or investing in higher education. Accordingly, face validity was applied to the concepts. The specifications and variables were defined by external governing or accrediting agencies giving them content validity. Except for the introduction of the FAFSA data for predictor variables, all variables were operationalized and used in numerous previous studies providing a degree of reliability (Braxton & Lee, 2005).

While research on the timing of FAFSA completion is scarce, its ubiquitous use as the tool for determining student financial viability lends a degree of reliability to its use. Since the research goal was prediction of persistence or departure based on predictor variables, the success of their predictive ability was intended to establish criterion validity. Samples were taken on various subsets of the cohorts to assure stability, and compared to the results from similar groups to verify consistency. Finally, use of secondary data allows the predictive model to be cross-validated with previous and future year's data and can be compared with results from other institutions.

Retention researchers have uniformly relied on quantitative methods to test their theories (Braxton, Hirschy, & McClendon, 2004; Berger & Braxton, 1998), yet their findings draw conclusions about departure, based on aggregated, national datasets heavily weighted with persisters (Astin, 1997). As a result, institutions may adopt retention recommendations with little relevance to the unique student characteristics of their institution, ignoring students who indicate departure for financial reasons as "ex post-

facto rationalization" (Tinto, 1993). Implementing retention programs like on-campus residency (Astin, 1997), orientation (Braxton & Lee, 2005) and remedial coursework (Adelman, 2006) add significantly to student costs either directly in extra charges or indirectly in the time it takes to graduate.

Departure as a whole, and specifically for financial reasons, has a greater relative impact on minorities, students of different ethnicities and low-income students (Tinto, 1993). Key researchers instead choose to define student characteristics of the entire institution by those held by the institutional majority (Tierney, 1992) and ignore cultural differences in financial matters (Dowd, 2006; Fitzgerald & Delaney, 2002). Additionally, by limiting the scope of financial issues to financial aid and relegating the impact to a student's pre-entry decisions (Tinto, 1993), researchers ignore social and cultural inequities inherent in students' backgrounds (Becker, 1993; Bourdieu, 2001), or structural obstacles within governmental or institutional financial policies, procedures and their application (Bourdieu, 2001).

A finding of significant correlation does not imply cause and effect when using cross-sectional data (Mertens, 2005). Nevertheless, establishing statistical relationships, having time-order with regard to the independent and dependent variables, controlling for most rival causal variables, and having good theory and logic allows the making of reasonable causal assertions regarding the financial characteristics effect on departure.

Summary

In this this chapter I reiterated the research questions and hypotheses introduced in the last chapter and considered how they could be investigated with the use of quantitative methods applied to a single institution, Clarion University of Pennsylvania. I

then discussed how the variables were defined and operationalized to facilitate collection and analysis of secondary data. I discussed how the statistical analyses will be conducted. Finally, I discussed issues of external validity, operational validity, and reliability of measurement. Findings are shown in Chapter IV.

CHAPTER IV

FINDINGS

Introduction

This chapter begins with an overview of the institution and the two cohorts being studied, a first-year class starting in the fall of 2010, and a first-year class starting in the fall of 2011. A section follows with the descriptive statistics including demographics, pre-college characteristics, and financial data for each cohort year. Missing data are quantified and the methods for adjusting the datasets appropriately are discussed. A section is provided for each year to show the results of ordinary least squares multiple linear regressions to check for multicollinearity and to assess the residuals. Finally, the results of the logistic regressions are shown followed by a brief interpretation of those results.

The Institution and the Data Provided for Study

This study focuses on first-year, full-time, baccalaureate-seeking students at Clarion University of Pennsylvania, a medium-sized public institution in northwest Pennsylvania. Excel data files for each student were provided by Computing Services at Clarion. Each student had a proxy student number, with no other identifying information beyond the data analyzed as part of the research in order to ensure the students' anonymity.

Rather than examining samples of these students, availability of secondary data from the University's student information system allowed study of the population, the cohort of the above-referenced students for two academic years, 2010 and 2011. That

said, the raw data for these students still required modification in order to make it suitable for analysis by SPSS, the statistics program chosen for this project.

The secondary data in Clarion University's student information system is organized and formatted according to the parameters of the "Common Data Set" (CDS), collaboration between higher education data providers, publishers on higher education issues, and other higher education stakeholders. The consistency of CDS-aligned data allows for easier and more accurate comparisons between institutions of higher education in their reporting. The CDS can be a mixed blessing for research needs, however, because the consistency between higher education data facilitates generalization, but the data elements may not be as well suited for research purposes. A dictionary of relevant CDS fields from Clarion University's Office of Institutional Research are provided in Appendix 1 to further explain data set definitions and to provide a guide for modifying the data to meet the purposes of this research.

The data did not fit the original data request for first-time-in-college, full-time, baccalaureate-degree-seeking students. The baccalaureate-seeking information is given in the variable, "Level". The Excel spreadsheet included data for associate degree-seeking students indicated as level "G", non-degree students indicated as level "A", and baccalaureate-degree-seeking students indicated as "H". Since associate-degree and non-degree students were not the focus of this study, data for the five non-degree students and 130 associate-degree students were deleted from the research data under consideration for the original 1,247 students provided, leaving 1,112 students for 2010. For 2011, data for seven non-degree students and 123 associate-degree students were deleted from the

research data under consideration for the original 1,254 students provided, leaving 1,124 students

Additionally, the definition of full-time students at Clarion University is twelve student-credit-hours and above. Upon further review of the current credits attempted in the fall semester for the 1,112 remaining students in 2010, the data showed 13 students enrolled with fewer than 12 credits. These 13 student cases were also removed from the dataset, leaving 1,099 students' data for analysis. For 2011, data for 12 students with fewer than 12 credits were removed, leaving 1,112 remaining students.

Addressing other issues for remaining students, the first-time-in-college variable indicated "Y" for first-time students and "N" for not first-time students. All students in the data had a "Y" in this variable indicating their first-time status, but the CDS definition allowed for students who took previous summer or intersession classwork, or college classwork in their high school to still qualify as first-time-in-college students under the definition.

Data for some variables required further modification of the Excel data files in order to make them ready for analysis by SPSS. For race/ethnicity, each category was given its own variable in the data file "H" for Hispanic as an example, or else "N" meaning the student was not part of that racial/ethnic group. If the student did not report any ethnicity, or no information was available for another reason, all categories/columns showed an "N". In some cases, more than one category/column was marked meaning the student was reported as multi-ethnic. An Excel formula was then used to consolidate the racial/ethnic data to a one-column record of no-report and multi-ethnic student data:

Data for student athletic status were shown in one variable/column, however it provided unnecessary detail regarding the sport played, which was not a focus of this study. The detail was therefore consolidated into "Athletes", and "Non-athletes".

Descriptive Statistics

2010 Demographics

Table 2 shows that almost two-thirds of the overall 2010 student cohort were female (63.9%), and the remaining were male students (36.1%), reflecting national trends of more female than males attending institutions of higher education. Only 10.9% of the cohort was minority, and 86.4% was listed as majority. Of the minority students, 6.6% was black and 3.2% was shown as multi-ethnic with American Indian/Alaskan native, Asian/Pacific Islander, and Hispanic accounting for less than 1% each. Summarizing the major age categories, 72.9% of the first-year cohort was 18-years old or younger, with 27.1% of the cohort 19 years old or older.

While data were recorded as to the marital status of the first year cohorts, information was unreliable since the marital status referred to the student if the student was independent and to the parent if the student was dependent overlooking the instances where a spouse may have been listed as a dependent of the other spouse. Fully 90.4% of the students were classified as dependents. Over one-third of students' families (35.0%) had three or fewer family members and in 67.2% of families, only one child attended college, with the remainder having two or more in college. Nearly half (43.4%) of students' mothers had completed some level of college or held a college degree. Conversely, just over one-third (36.9%) of students' fathers had completed a college degree or taken college courses.

Only 8.8% of the first-year student cohort participated in university-funded student athletic programs. The majority (82.7%) of first-year students lived in university housing. Most (92.0%) first-year students did not receive work-study funding, with the majority of those receiving funds (1.9%) awarded $1,088 in funding.

2011 Demographics

Again, almost two-thirds of the 2011 student cohort was female (60.2%), which was a slight decline (3.7%) from 2010. Only 8.4% of the cohort was black, 84.4% were white, and 3.8% were shown as multi-ethnic, with Asian/Pacific Islander and Hispanic accounting for less than 1% each. Race and ethnicity categories summed to 13.5% minority, which represented a 2.6% increase in the minority proportion. Summarizing the major age categories, 72.2% of the cohort was 18 years old or younger and 27.8% were 19 years of age or older, relatively unchanged from 2010.

Almost all (89.7%) of the first-year students were classified as dependent. Just over one-third (35.8%) of students' families had three or fewer members with 59.1% having four or more. In 66.7% of families, only one child attended college, with 28.2% having two or more in college. Almost half (41.2%) of students' mothers had completed some level of college or held a college degree while and about one-third (33.0%) of students' fathers had a college degree or had taken college coursework. Overall the family demographics changed only slightly from 2010.

Fully 91.5% of the first-year student cohort did not participate in university-funded student athletic programs. The majority (76.1%) of first-year students lived in on-campus University housing, while 23.9% lived in non- university housing, a decreased of 8.3% in 2011, attributable to a 10.7% decline in the number of first-year students in on-

campus housing. Almost no first-year students (1.0%) received work-study funding, a student-involvement factor which (Tinto, 1993) researchers have suggested would contribute to greater retention.

Table 2

Student Demographic Characteristics for First-Year Cohorts: 2010 and 2011

	2010		2011	
Variable	N	Percent	N	Percent
Gender				
Female	702	63.9	669	60.2
Male	397	36.1	443	39.8
Race/Ethnicity				
Black	72	6.6	93	8.4
American Indian/Alaskan Native	2	0.2	-	-
Asian/Pacific Islander	7	0.6	7	0.6
Hispanic	3	0.3	8	0.7
Multi-Ethnic	35	3.2	42	3.8
Total – Minority	119	10.9	150	13.5
White/Majority	950	86.4	939	84.4
None/Not Reported	30	2.7	23	2.1
Grouped Age				
17 Years Old	10	0.9	11	1.0
18 Years Old	791	72.0	792	71.2
Total - 18 Years and Younger	801	72.9	803	72.2
19 Years Old	253	23.0	258	23.2
20 Years Old	14	1.3	20	1.8
21 Years Old and Above	31	2.8	31	2.8
Total - 19 Years and Older	298	27.1	309	27.8
Dependency Status				
Dependent	993	90.4	997	89.7
Independent	47	4.3	57	5.1
Not Reported	59	5.4	58	5.2
Number in Family				
3 Members or Less	385	35.0	398	35.8
4	369	33.6	370	33.3
5	213	19.4	199	17.9
6 Members and above	72	6.5	88	7.9
Total – 4 Members or More	654	59.5	657	59.1
Not Reported	60	5.5	57	5.1
3 Members or Less	385	35.0	398	35.8
Family Members in College				
1 Member	738	67.2	742	66.7
2 or More	301	27.4	313	28.2
Not Reported	60	5.5	57	5.1

Table 2

Student Demographic Characteristics for First-Year Cohorts (Continued)

	2010		2011	
Variable	N	Percent	N	Percent
Mother's Education				
High School or Below	488	44.4	525	47.2
College and Beyond	477	43.4	458	41.2
Not Reported	134	12.2	129	11.6
Father's Education				
High School or Below	544	49.5	607	54.6
College and Beyond	406	36.9	367	33.0
Not Reported	149	13.6	138	12.4
Athletic Participation				
Athletes	97	8.8	95	8.5
Non – Athletes	1002	91.2	1017	91.5
Residence				
University Housing	909	82.7	846	76.1
Non – University Housing (or Not Reported)	190	17.3	266	23.9
Work Study Eligibility				
$0	1011	92.0	1048	94.2
$545	2	0.2	2	0.2
$870	3	0.3	1	0.1
$980	1	0.1	-	-
$1,088	21	1.9	7	0.6
$1,631	-	-	1	0.1
$2,175 or above	3	0.3	-	-
Not Reported	58	5.2	53	4.8

Departing Students

As shown in Table 3, almost a third (31.2%) of the 2011 first-year cohort departed with the remaining 68.8% persisting. This represented a slight decline in persistence from 2010, a year in which 71.1% of the cohort persisted. While both genders and racial/ethnic groups were affected, the effect was slightly lower in 2011 than 2010 for males (.6% increase in departure) and minority students (2.3% increase in departure).

Table 3

Persistence and Departure Rates: By Total and By Gender and Race/Ethnicity

	2010		2011	
Variable	N	Percent	N	Percent
Departure				
Depart	318	28.9	347	31.2
Persist	781	71.1	765	68.8
Gender of Departing Students				
Female	137	43.1	195	56.2
Male	181	56.9	152	43.8
Race/Ethnicity of Departing Students				
Minority	52	16.4	68	19.9
Majority	258	81.1	273	80.1
Not-Reported	8	2.5	6	1.7

Pre-College Academic Ability

As shown in Table 4, the average high school GPA for 2010 first-year students was 3.28 and the average high school GPA for 2011 first-year students was 3.20, both on a 4.50 scale. High school ranking and size of graduating class data was also provided; however, the high school rank and size correlation with high school GPA was over .80, so statistics regarding high school rank and size were removed from consideration.

Table 4

Pre-College Student Academic Ability for First-Year Cohort

	2010				2011			
Variable	N	M	SD	SE	N	M	SD	SE
High School GPA	1051	3.28*	.51	.02	929	3.20*	55	.02
Missing GPA Data	48				183			

* GPA on a 4.50 scale with no zero GPA cases.

Student Costs

Table 5 shows first-year students in 2010 paid an average of $4,252.89 in tuition and fees for the fall semester. Room and board costs averaged $2,849.12 for the same semester so their total costs paid to the University for the semester averaged $7,102.01. Interestingly, although the mean for tuition and fees was one-and-a-half times (1.49) the mean room and board, the standard deviation for room and board was two-and-a-half times (2.49) the standard deviation for tuition and fees. This suggests most of the variability in the total cost for students was found in the room and board.

First-Year students in 2011 paid an average of $4,669.06 in tuition and fees for the semester. Room and board costs averaged $2,889.75 for the same period so their total cost paid to the University for the semester averaged $7,558.81. Tuition and fees increased by almost 10% over 2010 with about a one-and-a-half-percent increase in room and board. The standard deviation for room and board continued at two-and-a-half times the standard deviation for tuition and fees, so again, most of the variability in student costs comes from room and board. While students for both years have the potential of increasing or decreasing their room and board significantly by living off-campus, including living with their parents, the cost data for off-campus room and board is not shown in the university database. This phenomenon can make the room and board for any given student appear to cost nothing, regardless of what their actual room and board cost may be.

Table 5

Summarized Costs for First-Year Cohort

Variable	2010				2011			
	N	M	SD	SE	N	M	SD	SE
Tuition and Related Fees	1099	$4,252.89	680.39	20.52	1112	$4,669.06	740.58	22.21
Room and Board	909*	$2,849.12	1691.21	51.01	846*	$2,889.75	1,824.78	54.72

* Average Room and Board figures do not include off-campus housing since those costs are not available.

2010 Student Financial Aid

At first glance, the descriptive statistics shown in Table 6 for student financial aid look odd, particularly the work study with a standard deviation almost seven times the mean. This occurs because of a skewed distribution in the level of aid. For work study, 92.0% of students are eligible for the minimum level of aid, zero. All other levels of aid combine for only 2.8% not considering non-reports. This skews the mean severely toward zero. Pell funding shows a bi-modal distribution with well more than half the students (56.9%) with Pell at zero funding, and almost 20% (19.7%) with Pell funding at $2,750 or $2,775, the two highest levels.

The FAFSA date required converting the date value to a number, then standardizing that number by dividing it by the first possible submission date in order to analyze it in SPSS. After converting all the valid FAFSA submission dates to numbers, the number for the first possible submission date, January 1, 2010 was subtracted from each submission number. The results ranged from 4 representing January 4th, 2010 to 574 representing July 28th, 2011 with a bi-modal distribution grouped around the April 15th federal tax deadline since income tax return information is necessary in order to complete the FAFSA. The mean FAFSA number was 147.39, a date of May 26th, 2010.

Table 6

Financial Aid and Related Information for 2010 First-Year Cohort

	2010			
Variable	N	M	SD	SE
Pell Grants	1041	$902.35	1158.22	35.90
Work Study Eligibility	1041	$35.84	243.46	7.55
Student Loans	1041	$2,224.38	2387.50	74.00
Scholarships and Grants (Excluding Pell)	1099	$1,225.55	1359.08	41.00
Expected Family Contribution	1040	$8,197.16	13111.61	406.57
FAFSA Submission Date	1040	147.39	92.38	2.86

2011 Student Financial Aid

As shown in Table 7, for 2011, the mean for work study fell to 70% of the 2010 level. This reflected a 64% decrease in the number of students eligible for federal work study from 30 in 2010 to 11 in 2011. While there is no assured means of correlating this with the student loans, the mean for student loans grew by 81% during the same time period.

In somewhat of a surprise, both the mean and the standard deviation for the 2011 FAFSA date were cut in half compared to 2010, 51.1% for the mean and 51.9% for the standard deviation. Instead of 2010's bi-modal distribution grouped around the April 15th federal tax deadline, the mean FAFSA number for 2011was 72.00, a date of March 13th, 2011. This combined with a higher number of student loans, and a lower number of other kinds of aid available in 2011 suggests that students and their parents may have filed their taxes and FAFSA forms earlier in order to qualify for more scarce financial aid or that the university's financial aid office improved their ability to process the FAFSA forms through their office qualifying students for aid.

Table 7

Financial Aid and Related Information for 2011 First-Year Cohort

	2011			
Variable	N	M	SD	SE
Pell Grants	1059	$984.13	1202.46	36.95
Work Study Eligibility	1059	$10.58	107.28	3.30
Student Loans	1059	$4,035.83	3150.86	96.82
Scholarships and Grants (Excluding Pell)	1112	$1,277.49	1403.48	42.09
Expected Family Contribution	1059	$8,543.50	8067.31	247.90
FAFSA Submission Date	1058	72.00	44.40	1.36

2010 Data Analysis

Adjusting for Missing Data

The initial run of 2010 logistic regression showed 252 missing cases, or 22.9% of the data analyzed. This seemed rather high, however, by default SPSS omits any case from a multivariate analysis when data are missing for any variable (listwise deletion of data). Upon further review, many of the missing cases occurred because of the nature of self-reporting to the University, either through the admissions process or through the financial aid process on the FAFSA form. This would classify the data as "missing not completely at random".

In 30 cases, the race/ethnicity was missing or not reported. In 59 cases, marital status was missing as well as the dependency status. In 60 cases, the number of people in the family and the number of children in college was missing. In 134 cases, the mother's level of education was missing and in 149, the father's level of education was missing. Many of these occurred where the data for marital status was also missing. In 48 cases the GPA was missing, and the high school ranking was missing in 141 cases. If a student

entered Clarion University with a GED certification, a high school ranking would not be available.

In 59 cases, the FAFSA submission date was missing in conjunction with the same number of missing items for expected family contribution. For these cases, Pell grants, work study, and loans showed zero in all but one case. Much of the financial data expected family contribution for example, was entered in the FAFSA submission or depended on the FAFSA submission like Pell or work-study, so if a student chose not to submit a FAFSA, the other data would not be available. Overall, missing data described above sum to more than the 252 missing cases because of overlap in the types of missing data in the same cases.

A critical decision involved the interpretation of missing cases for the father's level and mother's level of education. One of the possible responses given in the data collection was "Other/Unknown". This response was provided by 72 students for the mother's level, and 84 provided this response for the father's level. Since this response could mean any level of the education or a non-response, I chose to interpret this as missing data.

In order to consistently adjust for missing data, while not biasing the results, a conservative approach was adopted for both categorical and numerical data. For numerical data, the mean was substituted for all variables with missing data. For categorical data, a missing values indicator was created with the missing cases coded as 1 and all other values coded as zero. These missing values indicators were included in all of the logistic regression analyses where relevant.

Analyzing Departure With Logistic Regression

Binary logistic regression was used to analyze the cohort data and predict departure. Logistic regression was selected as the appropriate statistical tool for this study because the predictor variables were continuous or categorical and because the result being predicted, departure or persistence was dichotomous (Field, 2005). Furthermore, because the regression was intended to provide the probability of the dichotomous dependent variable, rather than to predict the variable itself, the relationship between the independent variables and the dependent variable was non-linear making linear regression less useful (Field, 2005).

The variables were entered in three different blocks. The first block included demographic characteristics and pre-college academic ability, which were used as control variables that have been identified as important predictors by previous retention researchers. The second block contained athletics and student residence variables, which are typical of student involvement concepts in the research and recommendations of Astin (1975). The third block contained financial variables for costs and financial aid as suggested by the literature review and the resulting financial departure model that is the focus of this study. After addressing missing cases, outliers, and influential cases, logistic regression analyses were reviewed for their ability to predict departure, as evidenced by their log-likelihood probabilities and the model pseudo R-Squares.

Multivariate Analyses of the 2010 Cohort

Examination of the bivariate correlation matrix revealed that high school rank by size was highly correlated with high school GPA at .81, so this variable was removed from further analyses. The next highest correlation was between room and board

charges and residence at .73. Because this value did not break the .80 threshold for problem correlations, and the correlation could be attributed to a logical underlying relationship while the data tracked two different types of information, both variables were retained. Additionally, removing the high school rank by size variable reduced missing cases to 252 or 22.9%.

Assessing Multicollinearity and Residuals

An ordinary least squares (OLS) multiple linear regression was run on the variables to assess for possible multicollinearity issues (Field, 2005). As Table 8 indicates, no predictor variable had a tolerance less than .2 or a variance inflation factor (VIF) higher than 10, so the model equation was relatively stable. The highest VIF's and correlation of occurred for residence and room and board. Because they were highly correlated residence was removed, which then made room and board significant and improved the accuracy of the model in the subsequent logistic regression equations.

Table 8

Review for Potential Multicollinearity of 2010 Cohort Data

	2010	
Variable	Tolerance	VIF
Gender	.913	1.095
Race/Ethnicity	.893	1.120
Grouped Age	.899	1.112
Dependency Status	.846	1.182
Number in Family	.785	1.274
Number in College	.808	1.237
Mother's Education	.848	1.180
Father's Education	.832	1.202
High School GPA	.830	1.205
Student Athletics	.934	1.070
Student Residence	.409	2.443
Tuition and Related Fees	.932	1.073
Room and Board	.426	2.346
Work Study Eligibility	.582	1.718
Student Loans	.856	1.168
Scholarships and Grants (Excluding Pell)	.710	1.409
Expected Family Contribution	.713	1.402
FAFSA Submission Date	.822	1.216

The logistic regression was conducted in which I regressed departure on the predictor variables in three steps. I examined studentized, normalized and deviance residuals to determine if there were absolute values greater than 1.96 (Field, 2005). All the outlier residuals resulted from students departing who the model suggested would persist. Closer examination suggests that these students have high GPA's in common, which typically indicates persistence. It is possible that these students may have greater opportunity to improve their situation by virtue of their academic performance. There did not seem to be sufficient reason to remove the residuals from the model, however, and there were too few to draw definitive conclusions.

Interpreting the Logistic Regression Results

The logistic regression was run in three stages. In the first model, I included the pre-college characteristics to act as control variables. In the second model I included the pre-college characteristics in block one, and then entered first-year student involvement indicators as a second block of control variables. For model 3, I entered a third block of variables that included all of the student financial characteristics. Specifically, the third block contained financial variables for tuition and related fees, room and board, Pell grants, work-study eligibility, student loans, scholarships and grants (excluding Pell), expected family contribution, and FAFSA submission date. The dependent dichotomous variable was departure or persistence, with the primary focus of interpretation being on departure.

The success of the model in predicting was assessed by examining the percentage of departures forecasted and the -2 log-likelihood and significance of the model associated with the third and final block. The contribution of the control and independent variables was indicated by the Wald statistic, the significance of the variable, and the odds ratio. The overall viability of using financial characteristics as predictors would be shown by the change in Chi-square, the significance of the change in Chi-square, and by examining the change in the Cox-and-Snell R-square and the Nagelkerke R-square.

Initially, kurtosis and skewness for the financial variable distributions that resulted from for the number of zero values and the bi-modal distributions resulted in B-values of zero for all financial variables except tuition and fees and room and board. To remedy this problem, all the financial variables were transformed by dividing the values by the means, thus flattening the distributions. The resulting variables provided results

similar to the significance of the untransformed variables, but now with non-zero B-values. Therefore, I show the results using the transformed financial variables, thereby providing meaningful interpretations of the odds-ratios.

As shown in Tables 9, 10, and 11, the overall models of departure were significant. Examination of model 1 in Table 9 shows that the control variables as a block significantly predicted departure. The -2 Log Likelihood is significant, and the Cox & Snell and Nagelkerke Pseudo R-squares of .098 and .140 were moderately high. Control variables that were significant predictors were minority status ($p < .10$; two-tailed), father's education ($p < .05$; two-tailed), and high school GPA ($p < .01$; two-tailed). Easily, the most important predictor of departure was high school GPA; the lower the high school GPA, the greater the odds of departure. Overall, the model successfully classified 73% of the students, with a high specificity rate of 94% (the model accurately predicted persisters) and a low sensitivity rate of 20% (the model accurately predicted departers).

As shown in Table 10, adding athletic participation contributed modestly to the model, although it was significant at the .10 level (two-tailed), with an odds ratio of 1.56. Students who did not participate in athletics had a 1.56 greater odds of departure than students who participated in athletics. There was just a modest change in the pseudo R-squares however, with the Cox & Snell R-square increasing by .002 and the Nagelkerke R-square by .003. The overall success of classification of the model stayed the same, although the sensitivity rate increased very slightly by 0.6%, with a corresponding 0.2% decline in specificity.

The third model shown in Table 11 reveals that collectively the financial predictors were statistically significant, with a significant change in the -2 Log Likelihood and corresponding change in Chi-square. In addition, Model 3 explained 12.8% and 18.2% of the possible variance according to the Cox & Snell and Nagelkerke R-square's respectively. The overall success rate only improved slightly (0.9%) from the success rate associated with Model 1. The sensitivity improved to 27.4%, however, from 19.5%, although the specificity rate declined to 92.3% from 94.2% in Model 1. Therefore, the final model accurately predicted a modest percentage of departers.

As shown in Table 11, the strongest control variable was high school GPA ($p < .001$) with a Wald statistic of 45.2 and an odds ratio of .34. The lower the high school GPA, the greater the likelihood of departure. Minority status was also significant ($p < .09$; two-tailed) with minority students having 1.48 times the odds of departing. Students who had fathers with educational levels of high school or below had 1.40 times the odds of departure ($p = .05$; two-tailed). With regard to financial characteristics, FAFSA submission date was at the strongest predictor ($p < .001$) with a Wald statistic of 11.64 and an odds ratio of 1.54. The later the FAFSA submission date, the greater the odds of departure. In addition, room and board and scholarships and grants were also significant predictors ($p < .05$; two-tailed) with Wald statistics of 6.36 and 5.49 respectively and odds ratios of .73 and .81 respectively. Importantly, the higher the room and board costs, the lower the likelihood of departure (probably reflecting on-campus residence), and the higher the amount of scholarships and grants, the lower the likelihood of departure. Finally, student loans was a significant predictor ($p < .10$; two-tailed), with a Wald

statistic of 3.15 and an odds ratio of 1.14. The higher the amount of student loans, the greater the likelihood of departure.

Table 9

Logistic Regression for Factors in 2010 First-Year Departure
Model 1: Pre-College Characteristics

Variable	B	Wald	Sig.	Odds Ratio
Male	-.09	.39	.53	.91
Minority	.37	2.87	.09	1.45
Race/Ethnic Missing Data	-.33	.55	.46	.72
Age 18 and Younger	-.18	1.23	.27	.84
Independent[1]	.35	.98	.32	1.42
Family of Four or More[1]	.21	1.58	.21	1.23
More than One in College[2]	-.12	.47	.49	.89
Mother's Education – High School or Below	-.17	1.10	.29	.85
Mother's Education – Missing Data	.28	.96	.33	1.33
Father's Education – High School or Below	.39	5.44	.02	1.48
Father's Education – Missing Data	.70	6.56	.01	2.01
High School GPA	-1.21	61.77	.00	.30
Constant	2.82	29.82	.00	16.83

[1] Independent and Family Size Missing Data Variable not included because multicollinearity generates significance of 1.00 and Odds Ratio of 0 or > 1,000,000.
[2] Family in College Missing Data Variable not shown because regression forces variable out of the equation.

Model Accuracy		*Pseudo R-Squares*	
Original -2 Log Likelihood	1322.24	Cox & Snell	.098
Block 1 Chi-Square	-113.41	Nagelkerke	.140
Improved -2 Log Likelihood	1208.83		

Classification Table

	Predicted		Percentage
Observed	Persist	Depart	Correct
Persist	736	45	94.2
Depart	256	62	19.5
Overall Percentage			72.6

Table 10

Logistic Regression for Factors in 2010 First-Year Departure
Model 2: Pre-College Characteristics and Student Involvement

Variable	B	Wald	Sig.	Odds Ratio
Male	-.12	.65	.42	.89
Minority	.37	2.95	.09	1.45
Race/Ethnic Missing Data	-.34	.60	.44	.71
Age 18 and Younger	-.17	1.14	.29	.84
Independent[1]	.34	.95	.33	1.41
Family of Four or More[1]	.22	1.71	.19	1.24
More than One in College[2]	-.12	.46	.50	.89
Mother's Education – High School or Below	-.17	1.18	.28	.84
Mother's Education – Missing Data	.29	1.01	.31	1.34
Father's Education – High School or Below	.37	4.78	.03	1.44
Father's Education – Missing Data	.67	6.04	.01	1.95
High School GPA	-1.21	61.69	.00	.30
Athletic Non-Participation	.45	2.70	.10	1.56
Constant	2.44	18.48	.00	11.45

[1] Independent and Family Size Missing Data Variable not included because multicollinearity generates significance of 1.00 and Odds Ratio of 0 or > 1,000,000.
[2] Family in College Missing Data Variable not shown because regression forces variable out of the equation.

Model Accuracy	
Block 1 -2 Log Likelihood	1208.83
Block 2 Chi-Square	-2.86
Improved -2 Log Likelihood	1205.97

Pseudo R-Squares	
Cox & Snell	.100
Nagelkerke	.143

Classification Table

	Predicted		Percentage
Observed	Persist	Depart	Correct
Persist	734	47	94.0
Depart	254	64	20.1
Overall Percentage			72.6

Table 11

Logistic Regression for Factors in 2010 First-Year Departure
Model 3: Student Financial Characteristics Added

Variable	B	Wald	Sig.	Odds Ratio
Male	-.13	.77	.38	.87
Minority	.39	2.88	.09	1.48
Race/Ethnic Missing Data	-.59	1.68	.19	.56
Age 18 and Younger	-.10	.32	.57	.91
Independent[1]	.30	.67	.41	1.34
Family of Four or More[1]	.27	2.35	.13	1.30
More than One in College[2]	-.15	.68	.41	.86
Mother's Education – High School or Below	-.20	1.40	.24	.82
Mother's Education – Missing Data	.33	1.25	.26	1.40
Father's Education – High School or Below	.34	3.73	.05	1.40
Father's Education – Missing Data	.67	5.48	.02	1.94
High School GPA	-1.08	45.18	.00	.34
Athletic Non-Participation	.32	1.30	.25	1.38
Tuition and Related Fees	.86	3.77	.05	2.35
Room and Board	-.32	6.36	.01	.73
Pell Grants	.11	.30	.58	1.11
Student Loans	.13	3.15	.08	1.14
All Scholarships and Grants (Excluding Pell)	-.21	5.49	.02	.81
Expected Family Contribution	-.05	.80	.37	.95
FAFSA Submission Date	.43	11.64	.00	1.54
Constant	1.17	2.25	.13	3.21

[1] Independent and Family Size Missing Data Variable not included because multicollinearity generates significance of 1.00 and Odds Ratio of 0 or > 1,000,000.
[2] Family in College Missing Data Variable not shown because regression forces variable out of the equation.

Model Accuracy	
Block 2 -2 Log Likelihood	1205.97
Block 3 Chi-Square	-33.72
Final Model -2 Log Likelihood	1172.25

Pseudo R-Squares	
Cox & Snell	.13
Nagelkerke	.18

Classification Table

	Predicted		Percentage
Observed	Persist	Depart	Correct
Persist (Specificity)	721	60	92.3
Depart (Sensitivity)	231	87	27.4
Overall Percentage			73.5

2011 Data Analysis

As was done for the 2010 cohort, binary logistic regression was used to analyze the 2011 cohort data and predict departure. The same variables were used, and the same three models were computed for 2011, with the first block including demographic characteristics and pre-college academic ability control variables. The second block contained the athletic participation and student residence variables. The third block contained financial variables for costs and financial aid.

After addressing missing cases, outliers, and influential cases, logistic regression analyses were reviewed for their ability to predict departure, as evidenced by their log-likelihood probabilities and the model pseudo R-Squares. Running logistic regressions using an additional year of student cohort data allowed me to assess the external validity of the 2010 results.

Adjusting for Missing Data

The initial logistic regression analysis showed 342 missing cases, which constituted 30.8% of the 2011 cases. This listwise missing values rate was even higher than for 2010, but for the same reasons. .

For student demographics, the largest number of missing cases occurred for high school GPA and rank in class, 183 and 176 missing cases respectively. Again, if a student entered Clarion University with a GED certification, a high school ranking would not be available. In 23 cases the race/ethnicity was missing or not reported. In 58 cases, marital status was missing as well as the dependency status. In 57 cases, the number of people in the family and the number of children in college was missing. In 129 cases, the

mother's level of education was missing and in 138, the father's level of education was missing. Many of these occurred where the data for marital status was also missing.

In 54 cases, the FAFSA submission date was missing and 53 of those cases were also had missing values for Pell grants, work study, student loans, and expected family contribution. As in 2010, much of this data depended on the FAFSA submission or it would not be available. Overall, missing data described above sum to more than the 342 missing cases because of overlap in the types of missing data in the same cases.

As with 2010, the mean was substituted for all continuous variables with missing data. For categorical variables, missing values indicators were created with the missing values coded as 1 and all other values coded as 0. These missing values indicators were then included in all of the logistic regression analyses where relevant.

Assessing Multicollinearity and Residuals

An OLS multiple linear regression was computed to assess for possible multicollinearity issues (Field, 2005). As Table 12 reveals, no variable had a tolerance less than .2 or a variance inflation factor (VIF) higher than 10 so the model equation was stable, however, the VIF's for Pell grants and expected family contribution approached 3, indicating potential problems. Examination of the bivariate correlation showed that Pell grants had a correlation of .67 with expected family contribution. Since there were so few students with Pell grants, Pell grants was dropped from further consideration. As with 2010, few students in 2011 had work-study either. Since logistic regression would not give meaningful results with so little data, that variable was also dropped from consideration.

Table 12

Review for Potential Multicollinearity of 2011 Cohort Data

	2011	
Variable	Tolerance	VIF
Gender	.911	1.098
Race/Ethnicity	.861	1.161
Grouped Age	.907	1.102
Dependency Status	.859	1.164
Number in Family	.809	1.236
Number in College	.844	1.184
Mother's Education	.871	1.148
Father's Education	.837	1.195
High School GPA	.804	1.244
Student Athletics	.904	1.106
Student Residence	.677	1.478
Tuition and Related Fees	.930	1.075
Room and Board	.634	1.577
Pell Grants	.343	2.913
Work Study Eligibility	.982	1.018
Student Loans	.836	1.196
All Scholarships and Grants (Excluding Pell)	.652	1.534
Expected Family Contribution	.348	2.875
FAFSA Submission Date	.883	1.133

As with 2010 data, kurtosis and skewness caused B-values of zero for all financial variables except tuition and fees and room and board. To remedy this, the financial variables were transformed by dividing the values by the means, thus flattening the distributions. The resulting variables provided results similar to the significance of the untransformed variables, but now with non-zero B-values.. Therefore, I show results using the transformed versions of the financial variables, thereby providing meaningful interpretations of the odds ratios.

The logistic regression equations were computed, in which I regressed departure on the predictor variables in three steps as I did with the 2010 cohort. I examined the studentized, normalized and deviance residuals to determine if there were absolute values

greater than 1.96 (Field, 2005). The 12 studentized residuals greater than 1.96 resulted from students departing who the model suggested would persist. All but one were majority students, and they were all dependent students and all lived in university housing. No other elements in common suggest a sufficient reason to remove the residuals from the model.

Interpreting the Logistic Regression Results

As shown in Tables 13, 14, and 15, the overall models of departure were again significant. Examination of Model 1 in Table 13 shows that the control variables as a block significantly predicted departure. The -2 Log Likelihood is significant, and the Cox & Snell and Nagelkerke Pseudo R-squares of .071 and .100 were moderately high. Control variables that were significant predictors were minority status ($p < .01$; two-tailed), being in a family of 4 or more ($p < .05$; two-tailed), and high school GPA ($p < .001$; two-tailed). Again, easily the most important predictor of departure was high school GPA with a Wald statistic of 41.5 and an odds ratio of .39; the lower the high school GPA, the greater the odds of departure. Overall, the model successfully classified 68% of the students, with a high specificity rate of 93.4% and a sensitivity rate of 13.5%. Model 1 was not as successful in predicting departure for the 2011 cohort as it was for the 2010 cohort, based on the lower pseudo R-squares and the lower sensitivity rate.

As shown in Table 14, adding athletic participation contributed modestly to the model. It was significant at the .01 level and had a Wald statistic of 7.43 and an odds ratio of 2.35. Students who did not participate in athletics had 2.35 the odds of departure than students who did participate. The change in pseudo R-squares was modest, however, while the sensitivity rate only improved 1.8% to 15.3% in Model 2.

The third model for 2011 shown in Table 15 reveals that collectively the financial variables were significant, with a statistically significant change in the -2 Log Likelihood and corresponding change in Chi-square. In addition, Model 3 explained 10.3% and 14.5% of the possible variance according to the Cox & Snell and Nagelkerke pseudo R-squares respectively. The overall success rate improved slightly (to 69.7%), and the sensitivity rate improved to 21.6% (from 13.5% in Model 1). Therefore, the final model accurately predicted a modest percentage of the departures. As shown in Table 15, the strongest control variable was again high school GPA ($p < .001$; two-tailed), with a Wald statistic of 27.9 and an odds ratio of .44.. Father's education was no longer significant, however, minority status was a moderate predictor ($p < .01$; two-tailed) with a Wald statistic of 8.94. Minority students had a 1.87 greater odds of departure than white stduents. Participation in athletics was also significant in the final model ($p < .001$; two-tailed) with Wald statistics of 4.77. Students who did not participate in athletics had twice the odds of departure as athletes (OR = 2.02).

With regard to financial variables, room and board was again significant ($p < .05$; two-tailed) with a modest Wald statistic of 4.80 and an odds ratio of .77. The FAFSA submission date, however, was no longer significant. Expected Family Contribution was a modest predictor of departure ($p < .05$; two-tailed) with a Wald statistic of 3.54 and an odds ratio of .78. Based on the negative signs associated with their beta values, the odds ratios suggest that higher room and board costs and higher expected family contributions predict a lower rate of first-year departure.

Table 13

Logistic Regression for Factors in 2011 First-Year Departure
Model 1: Pre-College Characteristics

Variable	B	Wald	Sig.	Odds Ratio
Male	-.02	.01	.91	.98
Minority	.55	7.92	.00	1.73
Race/Ethnic Missing Data	-.37	.40	.53	.69
Age 18 and Younger	-.07	.22	.64	.93
Independent[1]	-.17	.29	.59	.85
Family of Four or More[1]	-.32	4.36	.04	.73
More than One in College[2]	.11	.45	.50	1.11
Mother's Education – High School or Below	.18	1.46	.23	1.20
Mother's Education – Missing Data	-.18	.36	.55	.83
Father's Education – High School or Below	.21	1.65	.20	1.23
Father's Education – Missing Data	.00	.00	1.00	1.00
High School GPA	-.93	41.54	.00	.39
Constant	2.12	16.80	.00	8.33

[1] Independent and Family Size Missing Data Variable not included because multicollinearity generates significance levels of 1.00 and Odds Ratio of 0 or > 1,000,000.
[2] Family in College Missing Data Variable not shown because regression forces variable out of the equation.

Model Accuracy	
Original -2 Log Likelihood	1319.49
Block 1 Chi-Square	-78.23
Improved -2 Log Likelihood	1241.26

Pseudo R-Squares	
Cox & Snell	.071
Nagelkerke	.100

Classification Table

	Predicted		Percentage
Observed	Persist	Depart	Correct
Persist	676	48	93.4
Depart	289	45	13.5
Overall Percentage			68.1

Table 14

Logistic Regression for Factors in 2011 First-Year Departure
Model 2: Pre-College Characteristics and Student Involvement

Variable	B	Wald	Sig.	Odds Ratio
Male	.02	.02	.89	1.02
Minority	.58	8.64	.00	1.78
Race/Ethnic Missing Data	-.37	.39	.53	.69
Age 18 and Younger	-.10	.43	.51	.90
Independent[1]	-.19	.36	.55	.83
Family of Four or More[1]	-.29	3.53	.06	.75
More than One in College[2]	.10	.40	.53	1.11
Mother's Education – High School or Below	.17	1.20	.27	1.18
Mother's Education – Missing Data	-.19	.38	.54	.83
Father's Education – High School or Below	.18	1.29	.26	1.20
Father's Education – Missing Data	.01	.00	.98	1.01
High School GPA	-.93	40.42	.00	.40
Athletic Non-Participation	.85	7.43	.01	2.35
Constant	1.30	4.72	.03	3.67

[1] Independent and Family Size Missing Data Variable not included because multicollinearity generates significance levels of 1.00 and Odds Ratio of 0 or > 1,000,000.
[2] Missing Family in College Data not shown because regression forces variable out of the equation.

Model Accuracy	
Block 1 -2 Log Likelihood	1241.26
Block 2 Chi-Square	-8.52
Improved -2 Log Likelihood	1232.74

Pseudo R-Squares	
Cox & Snell	.079
Nagelkerke	.110

Classification Table

	Predicted		Percentage
Observed	Persist	Depart	Correct
Persist	671	53	92.7
Depart	283	51	15.3
Overall Percentage			68.2

Table 15

Logistic Regression for Factors in 2011 First-Year Departure
Model 3: Student Financial Characteristics Added

Variable	B	Wald	Sig.	Odds Ratio
Male	.03	.03	.86	1.03
Minority	.63	8.94	.00	1.87
Race/Ethnic Missing Data	-.46	.56	.45	.63
Age 18 and Younger	.07	.16	.69	1.07
Independent[1]	-.40	1.54	.21	.67
Family of Four or More[1]	-.21	1.71	.19	.81
More than One in College[2]	.07	.17	.68	1.07
Mother's Education – High School or Below	.07	.22	.64	1.07
Mother's Education – Missing Data	-.29	.87	.35	.75
Father's Education – High School or Below	.04	.06	.81	1.04
Father's Education – Missing Data	-.06	.05	.83	.94
High School GPA	-.81	27.87	.00	.44
Athletic Non-Participation	.71	4.77	.03	2.02
Tuition and Related Fees	.45	.77	.38	1.56
Room and Board	-.27	4.80	.03	.77
Pell Grants	.17	.48	.49	1.18
Work Study[1]				
Student Loans	.02	.05	.83	1.02
All Scholarships and Grants (Excluding Pell)	-.12	1.93	.16	.89
Expected Family Contribution	-.25	3.54	.06	.78
FAFSA Submission Date	.12	1.05	.31	1.13
Constant	-19.43	.00	1.00	.00

[1] Work Study, Dependency, Family Size and Pell Grant Missing Data Variables not included because multicollinearity generates significance levels of 1.00 and Odds Ratio of 0 or >1,000,000.

[2] Family in College Missing Data Variable not shown because regression forces variable out of the equation.

Model Accuracy	
Block 2 -2 Log Likelihood	1232.74
Block 3 Chi-Square	-28.81
Improved -2 Log Likelihood	1203.93

Pseudo R-Squares	
Cox & Snell	.103
Nagelkerke	.145

Classification Table

	Predicted		Percentage
Observed	Persist	Depart	Correct
Persist (Specificity)	665	59	91.9
Depart (Sensitivity)	262	72	21.6
Overall Percentage			69.7

Assessing the Impact of Financial Characteristics by Race/Ethnicity

The second research question asks whether the predictive power of financial characteristics changes based on the race or ethnicity of the student. A preliminary examination of the data was performed; however, the modest size of the minority population in each cohort, (119 students in 2010 and 150 students in 2011) did not provide enough students to run valid logistic regression equations with the number of predictor variables included in my models.

Summary

Overall, examining two years of results suggests that having a higher entering high-school GPA consistently reduces the probability of first-year departure at this institution. In addition, having higher room and board costs also reduced the probability of departure. Since room and board cost correlates with on-campus housing, this result would agree with Astin's prediction that on-campus housing builds involvement and therefore persistence. Conversely, being a minority student increases the probability of departure. Delay in submitting the FAFSA may increase the probability of departure based on 2010 results and having a higher level of scholarships and grants or higher expected family contribution may reduce departure based on 2010 and 2011 data respectively, altough these results are not consistent across cohorts.

Hypothesis 1, that predicts that financial characteristics are significantly correlated with the departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students during their first year, is partially supported by results of scholarships and grants, expected family contribution, and submission date for FAFSA but the results for specific financial variables are not consistent from year to year.

I could not test Hypothesis 2, which predicted that financial characteristics of full-time, first-time-in-college (FTIC), first-year baccalaureate-seeking students would differ significantly in how they predict departure depending on the race or ethnicity of the students because of the low number of minority students in the two first-year cohorts.

The following chapter provides an overview of this research study, discusses the results further, and considers the results in the context of previous research. Limitations, qualifications and delimitations are given followed by implications for future research.

CHAPTER V

DISCUSSION

Introduction

The purpose of this study was to analyze whether financial characteristics played a role in the departure of first-year students at a mid-sized public university. This research study used a one-institution, case-study approach and applied logistic regression to two cohorts of first-year college students to predict the probability of these students departing before starting their second year of study.

In this chapter I summarize and explain the results of the research question and hypothesis one in the first section, "Prediction of First-Year Departure Based on Financial Characteristics". The next section, "Prediction of First-Year Departure Based on Financial Characteristics and Race/Ethnicity," addresses research question and hypothesis two. The following section summarizes and explains possible reasons why the results were not consistent from one cohort year to another, and discuss the implications of these results. The chapter concludes with a discussion of the weaknesses and limitations of this study, followed by my recommendations for future research. The chapter concludes with suggested strategies for improving retention at this institution.

Research Questions and Hypotheses

Research Questions

The following research questions guided the research:

Research question 1. Do financial characteristics predict departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students from a rural masters-granting state institution of higher education during the first year?

Research question 2. If financial characteristics do predict first-year departure, do the results differ for different races, ethnicities, or other underserved groups?

Hypotheses

These generated the following hypotheses that were tested by the research.

Hypothesis 1. Financial characteristics are significantly correlated with the departure of full-time, first-time-in-college (FTIC), baccalaureate-seeking college students during their first year.

Hypothesis 2. Financial characteristics of full-time, first-time-in-college (FTIC), first-year baccalaureate-seeking differ significantly in how they predict departure of students depending on the race or ethnicity of the student.

Financial Characteristics Predicting First-Year Departure

The findings produced mixed results regarding whether financial characteristics predict first-year departure, curiously, in some instances, by cohort.

A first glance at financial characteristics shows very consistent results from room and board showing a beta of -.32 ($p < .05$ for 2010) and a beta of .-.27 ($p < .05$) for 2011. The negative sign of the beta for room and board tells us that higher room and board costs predict a decreased chance of departure. Higher room and board costs are correlated with on-campus residence, particularly since off-campus residence costs are generally omitted from the campus student database. Likely, what we see here then is on-campus residence reducing the rate of departure consistent with Astin's (1997) theory of student involvement.

However tuition and related fees are a different situation, contributing to departure in 2010 ($p < .05$; two-tailed) but not in 2011 ($p > .10$; two-tailed). As shown in

table 5, there is considerably more variation in room and board, indicated by the standard deviation, then found in the tuition and fee charges. Actually, some of the variation in room and board is understated because off-campus room and board charges are not entered into the Student Information System. Most of the variation found in tuition and fees then, comes from the differences between in-state tuition and out-of-state tuition.

All of the classes of out-of-state tuition including international, non-resident and distance education were pegged to the in-state tuition rate so when in-state tuition increased by 7.5% between 2010 and 2011, all other tuition increased by 7.5%. Even though the non-resident tuition increased at the same rate, Trustees for the Pennsylvania State System had previously set the out-of-state tuition at twice the in-state rate, and the international tuition at two-and-one-half times the in-state rate. As a result, the 7.5% increase in the out-of-state rate, $436, was twice as much as the increase in the-state rate, $218 and international rate increase, $545, was two-and-one-half times the in-state increase.

The 85 non-resident students enrolled in 2010 give too small a population to allow for definitive analysis. The 35% decrease in non-resident enrollment to 50 first-year students in 2011, however, would indicate Clarion University developed a problem in recruiting non-resident students. Information was not provided for this case study on the reasons these students left, nor for their destinations. As noted with the high GPA students who departed, however, it is quite likely a combination of concerns with their situation at Clarion University and better opportunities at other institutions led to their departure. Information on the availability of financial aid at Clarion University in 2010 may begin to explain the concerns.

In 2010, the FAFSA submission date was a good predictor of departure ($p < .01$; two-tailed). It was no longer a predictor in 2011. In this case, the FAFSA submission date decreased from an average of 147 days in 2010 to 72 days in 2011, which constituted a reduction of just more than 50 percent. Here, the FAFSA submission date depends not just on the student, but also on the institution and its ability to process the FAFSA.

According to the Clarion University Comprehensive Self-Study prepared to satisfy requirements for accreditation by the Middle States Commission on Higher Education (2012), significant delays occurred in processing financial aid in 2010. Additional staff was hired to remedy the problem, however, delays occurred again in 2011 associated with the implementation of a new student information system. The large decrease in the number of days for the FAFSA submission date noted above can be attributed to the increase in Financial Aid staff. Still, student perception of delays in financial aid cited in the Middle States Report (2012) suggest one reason that students may have left, particularly when combined with the higher student costs encountered by non-resident students. The results of logistic regression in 2010 support that conclusion.

In 2010, a higher level of scholarships and grants was associated with a lower predicted rate of departure ($p < .05$; two-tailed). This finding was not replicated in 2011. A review of the scholarships and grants awarded shows only a $55 difference in the amount from 2010 to 2011. Student loans, however, grew by $1,811, an 81% increase, and having higher student loans modestly increased the likelihood of departure in 2010 ($p < .10$; two-tailed). The increase in student loans were great enough, at least in dollar terms, to fill gaps in scholarships and grants that may have been found in 2010, but may

have increased the likelihood of departure. As mentioned previously, the reduction in FAFSA processing time may have also reduced departure for financial reasons.

Finally, in 2011, the expected family contribution was marginally significant ($p < .06$; two-tailed) as a predictor of a lower chance of departure. By definition according to federal guidelines, the expected family contribution should indicate the level of resources a family has to cover a student's college (Federal Student Aid, 2013a), so it is surprising that this was not a significant predictor in 2010. Here again, the effects of expected family contribution may have been obscured by delays in processing the student FAFSA forms in 2010.

Non-Financial Characteristics Predicting First-Year Departure

The findings suggest that a number of non-financial characteristics predicted first-year departure, for both cohorts.

The strongest correlation with prediction of departure for both 2010 and 2011 was high school GPA, with a negative coefficient indicating it decreased departure ($p < .001$; two-tailed). This finding is consistent with the most research on the subject. Some scholars express concern that high school GPA isn't comparable among students, since different high schools use different grading scales (Geiser & Santelices, 2007). This accounts for the reliance on standardized tests such as the SAT and the ACT. However, research has indicated that high school GPA is still the best and most consistent indicator of first-year persistence (Bean & Metzner, 1985; Geiser & Santelices; Reason, Terenzini, & Domingo, 2006) as well as success in subsequent years. The criticality of GPA to undergraduate performance is highlighted by the practices of college admissions offices, which use high school GPA for admissions decisions.

In fact, in a 2008 survey of the member institutions of the National Association for College Admission Counseling (NACAC) (2009), grades in college prep courses were the most important factor in the admissions decision. Grades in all high school courses were considered either of considerable or moderate importance by 86.5% of respondents (NACAC). Accordingly, it is possible that the analysis by logistic regression used in this study may actually underestimate the effects of GPA.

In 2010, 61 first-year students had GPA's of 3.5 and above. In 2011, 51 students had comparable GPA's. It is hard to envision students with academic records as successful as these departing the university to enter the job force. While there were no data available to confirm this assertion, it is more likely that the academic success of these students enabled them to find opportunities to transfer to other institutions to start their second year. This does not undercut the hypothesis that financial issues led to their departure either. As the proposed model suggests, financial opportunities at a new institution can play a part in the departure decision.

Another academic indicator related to departure was father's education. The father having a high school education or less increased departure in 2010 ($p < .05$; two-tailed). This effect diminished in 2011 to a significance level greater than .05, so it was examined further. Chapter III noted that male enrollment declined at Clarion University by 35% from 2008 through 2014, however the greatest decline occurred after 2010. This trend did not seem to correspond to the 10% increase in male first-year students seen from the 2010 cohort to the 2011 cohort. Further investigation uncovered a possible reason.

In 2010, Clarion County lost its third largest employer, and largest manufacturer, when the Owens-Illinois glass plant closed. The company, which bordered the university, employed 420 workers, and the closing was estimated to displace another 200 employees within the county. One possible explanation for the increase in first-year students may have been displaced workers from Owens-Illinois enrolling in nearby Clarion University. College enrollment and technical training was part of the relocation plan discussed by the community when Owens-Illinois closed. The one-time influx of these students into the university would explain the first-year enrollment contradicting the multi-year trends, an increase in the number of students with a lower level of father's education, and the corresponding change in the statistics for predicted departure for this cohort.

The regression analyses also showed that minority students seemed to depart earlier, with significance levels at $p = .09$ (two-tailed) and $p < .001$ (two-tailed) for 2010 and 2011 respectively. Further analysis was conducted in which I focused on minority students, and the preliminary results were promising. The small number of minority students available in both first-year cohorts, however, would not support the validity of the results.

Even so, Clarion University has had to acknowledge problems recruiting and retaining its minority students. Tierney (1992) argued that the forces at work motivating departure for minorities were different from those cited by Tinto or other major retention theorists. Even absent overt displays of racism, small communities like Clarion can appear unwelcoming to persons of color. For example, Clarion's African-American students publicly expressed their disappointment in at the lack of barbers or hairdressers skilled in working with their hairstyles. Additionally, the local Trailways bus line

discontinued its service from Clarion to Pittsburgh and Philadelphia in 2007, restricting access for urban students; this has particularly impacted minority and foreign students. Such issues may be relevant to the departure of first-year minority students.

A third significant characteristic predicting departure is student involvement in athletics. In both cohorts, non-participation in student athletics produced a higher probability of departure ($p < .10$; two-tailed in 2010; and $p < .05$; two-tailed in 2011), although the odds ratio was higher in 2011 (2.35 in 2011 versus 1.56 in 2010). As mentioned previously, athletic participation brings a complex mixture of factors that can impact student departure or persistence. On one hand, athletes can garner more aid funding or lose aid funding based on their individual athletic performance, the performance of the team, or donations to the athletic program or their individual sport. Further, whether or not scholarship funding accompanies athletic involvement, losing one's position on the team can motivate a student-athlete to depart. In addition, the schedule for athletic participation can present academic challenges for some students. But on the positive side, student athletes participate in mandatory study and tutoring sessions that may improve their academic success.

The results of all of the above can be increases or decreases in departure, but in this case, the net effects were that non-participation in athletics increased the likelihood of departure in the current study. Nonetheless, due to the complexity of the effects of the above issues, more detailed analysis of the impact of participation in athletics is largely beyond the scope of this research.

The retention literature also supports that the above non-financial characteristics contribute to student departure. While the results were not completely consistent in both

years in this case study, the explanations provided have been verified in public statements or written records as factors that could have led to the departure of first-year students for these two cohorts. Further validation of the explanations of these non-financial characteristics' effects on departure was beyond the scope of this research, given its focus on financial characteristics.

Discussion

In all likelihood, the impact of financial issues is intertwined with that of other factors. Entering GPA may depend on the resources a student's family had available during the student's high school years. The student's choice of residence during college certainly has much to do with the resources available to the student. Accordingly, whether discussing pre-college characteristics (Bean, 1985; Spady, 1971) or student involvement by virtue of residence (Astin, 1993), financial factors could act a mitigating factor. Astin (1993) correctly noted, and Tinto (1993) concurred, however, that an institution's policies will also determine student persistence, and many of those policies govern funding available for students.

Overall concerns with Tinto's (1993) paradigm, other than his late acceptance of the possible impact of financial issues, include the notion of the students as rational consumers, the assertion that the impact of higher education financial decisions stop at matriculation, and finally the idea that financial aid would give disadvantaged students the same opportunities to persist as others. None of these arguments may have been convincingly overcome by this research, however, the results suggest that finances do have value as predictors of departure. Trying to use financial characteristics to consistently predict departure would require an acute awareness of the institutional

policies governing finances for a given year though, and how those policies change from year to year (Dresch, 1975).

All of the above, combined with the results of this research, at minimum, support St. John, Cabrera, Nora, & Asher (2000) in asserting that financial decisions continue to take place after matriculation. Just as importantly, these results suggest that financial characteristics are correlated with departure, a post-matriculation decision. Although financial variables do significantly contribute to prediction of departure, the specific financial factors that influence departure may vary from year to year.

Research Implications

Use of Secondary Data

One could safely say these results have raised more questions than they have answered. This study used secondary data, which was limited and, at times, unusable. An institutional researcher given the latitude to explore further would have gone back to the student database numerous times for information that would clear up issues of confusion or lack of information. These follow-up efforts would have strengthened the results of this narrow study from a quantitative standpoint.

A further problem which hampers the use of a student database to conduct research is the very nature of secondary data. These databases are not designed for use in academic research. Rather, they are designed to answer questions for institutional comparison, usually to fulfill governmental requirements or other public purposes. That does not mean, however, that efforts, usually made by institutional staff, to gather information for a student database could not be expanded and refined in a way that answers internal institutional needs as well as external needs. An argument could

certainly be made for its value if it resulted in the persistence of students who might otherwise depart.

Equally frustrating was institutional data made available for public use on the University's website, other websites within the Pennsylvania State System on Higher Education (PASSHE), the National Center for Education Statistics (NCES) which houses IPEDS data, and College Insight, which packages IPEDS data in a more user-friendly format for "researchers and the public". Whatever the format, all these websites provided inconsistent and contradictory information and critical gaps in items like the measurement of first-year retention. These problems mean researchers must either thoroughly check the results of data gathered through these sites through other sources or choose not to use them.

Answering Research Questions Regarding Access to Cost and Aid

A different set of research questions could have been pursued using this same set of data. For example, I could have examined whether being a certain race, ethnicity, gender or having a parent with a certain level of education were correlated with different levels of aid. Such analyses would have allowed me to determine whether financial characteristics mediate the effects of other predictors. Further research with more comprehensive data sets should pursue this research objective.

Qualitative Research

Admittedly, a thorough examination of student departure would also use qualitative investigation. A more in-depth study could involve document analysis and interviews in order to buttress the quantitative methods used here with a full understanding of the policies and procedures that affected students and their finances

during their first year in college. The most important interviews would be with the students themselves. One recurring problem with studying college student departure is the difficulty in gathering information from students once they have departed the institution. The temptation may then be to draw conclusions about departing students based on the students that remain, but that approach seems innately flawed.

At times, it appears that conducting research on financial issues affecting students fulfills or opposes items on a political agenda, particularly insofar as it affects students at state institutions of higher education. While finding that financial issues may lead college students to depart certainly could motivate an argument for more financial aid, more generally it can assist an institution or a state in more effectively using the financial aid available. Finding that the date for submitting a FAFSA form may be critical suggests that more research needs to be done on that narrow activity and ways that students and their parents could be assisted in the process.

I am not the first scholar to argue that students and their families do not have adequate financial information when making their college decisions. Improvements have been made in making more information available and the information that is available more accurate. Nonetheless, institutions have a vested interest in having students attend their institutions. If financial information confronting the student during the year overturns the decision to attend, then the original information may somehow be incorrect or incomplete. More research needs to be done on the decision to attend college (including where) to determine what other pre-matriculation information is needed and how best to provide it.

Students and their parents are not necessarily open to answering questions regarding financial issues. Notwithstanding issues regarding ethical treatment of students as research subjects, it can be difficult to gather large amounts of student data unless done with the full support, if not assistance, of the institution. Realistically, providing research data is not the first priority of students and it can be difficult to achieve valid results through channels such as student E-Mail. Even when such results are achieved, self-selection of respondents may distort the findings of such research.

Weaknesses and Limitations

This is a single institution study, and specifically I studied a less-selective, rural public masters-granting institution of higher education. Accordingly, findings will not generalize to selective, urban or private institutions. Additionally, they may not apply to two-year community colleges or doctoral/research institutions. Congruency between Clarion University of Pennsylvania and other universities for closer examination can be better assessed by comparing the Common Data Set for Clarion University of Pennsylvania with the university in question (Common Data Set [CDS], 2010). The common data set specifies the enrollment, demographic breakdown, expenses and average financial aid, all of which can be used to compare institutions. As stated previously, institutional comparisons or comparisons year-to-year may be distorted based on institutional and governmental policies in place at the particular point in time (Dresch, 1975)

My research also deviates from previous retention research, which summarizes nationally collected institutional data. Metz (2005) notes the value of individual institutional data in clarifying what leads to student departure. Tinto (1993) added that

policy initiatives would be more relevant and have greater impact when supported by single institution research. Implementation could be easier as well, since relevant institutional data could elicit greater buy-in.

In this study I focused on student departure. Tinto (1993) notes that departure is different from the absence of persistence or retention, therefore, we should apply retention research and theory with caution. Much of the current research, and Tinto's paradigmatic model, focuses on retention, not departure. With all the retention institutional policies and procedures which have been implemented, retention rates have remained stagnant (Terenzini & Reason, 2005), indicating these remedies have been inadequate. This situation calls for the introduction of an alternate model that extends previous research, particularly Tinto, but addresses gaps in student retention.

Though variables or descriptions of behavior may be related to departure, they may not apply to every student. Where possible, I disaggregated data and findings; however, each student possesses individual characteristics and behavior. Variables that represent financial characteristics also play a part in qualification for financial aid, therefore, an inherent bias exists since the main purpose of financial aid is to offset student financial shortfalls.

Studying the first year of postsecondary education is useful because most students who leave do so in the first year (Pascarella & Terenzini, 2005; Tinto, 1993). Findings regarding first-year departure do not necessarily generalize to departure in subsequent years. A longitudinal study over students' entire course of study until degree completion could generate more departure-related information, and enhance the information found in this study.

Variables used in this study were limited to those that have been suggested by previous studies as affecting retention. Variables that have been omitted from consideration may have an effect on departure or persistence.

Conclusions

In this study I used secondary data in the university's student information system to identify financial characteristics as potential risk factors correlated with first-year students leaving the university before beginning their second year. The secondary data also provided information on the characteristics of departing students. The data were then analyzed to determine whether financial variables helped prediction of departure above and beyond other determinants.

The results provided support for the argument that financial characteristics do predict first-year student departure, although specific financial predictors were different across the two cohorts. This can prove valuable, both in extending our understanding of first-year student departure behavior, as well as for improving the theories developed to explain student retention. It can prove equally valuable, however, in crafting institutional strategies to curtail departure and policies which could make financial aid and institutional billing more student-friendly and effective.

The act of conducting this research and its results have highlighted one over-arching truth: there is a distinct and growing gap between higher education, governmental policy, academic research on higher education, and the institutional policies and strategies that the current body of research generates. This gap is evidenced in the current inability of many institutions of higher education to improve their rate of

retention, and the success of public higher education depends on research that looks at students and institutional policies in new and different ways.

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