Intertemporal choice and enrollment: exploring the influence of latency on enrollment yield within the recruitment funnel

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Intertemporal Choice and Enrollment: Exploring the Influence of Latency on Enrollment Yield within the Recruitment Funnel

by

Gregory A. Guzmán

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Doctor of Philosophy Degree in Higher Education

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December 2014
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An Abstract of

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The higher education marketplace in the United States has changed. Competition has increased, and modes of instructional delivery have changed to meet demand, yet enrollment at post-secondary institutions in the United States has been declining. Students have not persisted through the pre-matriculation funneling stages of the enrollment process with the same consistency as they have in the past. The purposes of this dissertation were (a) to assess the period of latency between application and enrollment and (b) to determine whether students would be more likely to persist through the recruitment funnel if institutions altered their enrollment calendars. The researcher reviewed data from a single-proprietary institution comprised of multiple campuses located throughout the eastern and southern portions of the United States to determine the influence of latency, within the recruitment funnel, upon yield. Upon the exploration of nearly 4 years worth of data and more than 32,000 student files, the researcher was able to determine that increasing the number of start dates did not practically influence students’/consumers’ purchasing behavior at Career College. Furthermore, shortening the latency period did little to nothing to impact the percentage of students persisting
through the recruitment funnel. However, the findings did reveal significant behavioral differences between traditional and non-traditional students. In summation, the findings revealed that students are essentially consumers who will act upon their desire to purchase products (e.g., a college degree) in a time frame consistent with their own immediate needs and opportunity costs, regardless of institutional efforts to influence them to do otherwise. In other words, latency is an institutionally controllable factor that does not appear to alter the course of enrollment yield among traditional students.
I lovingly dedicate this work to my wife, Jennifer.
Acknowledgements

I would like to take the opportunity to thank my wife, Jennifer; my daughter, Miranda; and my son, Caiden for all of their support and understanding during this time.

I also would like to thank my entire committee, and those who have assisted me throughout this process, for their commitment and unwavering support.
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Chapter 1

Introduction

As the new millennium began, educators and politicians emphasized accessibility and affordability for individuals who wished to pursue higher education in the United States. Composed of three primary sectors of higher education—(a) the public, state-funded sector; (b) the private, non-profit sector; and (c) the private, for-profit (proprietary) sector—administrators of the U.S. system sought to increase the educational readiness of its citizenry. During the past decade, the U.S. Government provided access at a level that has been unmatched in recent history, and according to Pryor, Hurtado, Saenz, Santos, and Korn (2007), all students were afforded an opportunity to pursue their dreams of a college education, regardless of race, gender, or socioeconomic status. McCluskey and Edwards (2009) reported an increase in the U.S. Government’s investment in federal financial aid between 2000 and 2008 from $10 billion to $30 billion. This increase represented a continued investment in national higher education goals and a more egalitarian approach to higher education. According to the U.S. Department of Education (1995), colleges and universities across the country embraced students from all socio-economic and educational levels. College-bound students were provided access while institutions benefited from record-setting rates of enrollment and revenue growth (U.S. Department of Education, 1995). The U.S. Department of Education (2012) reported a 22% increase in the number of post-secondary institutions in the US between 1996 and 2010. The largest increase took place in the proprietary sector, which increased from 766,000 students in 2001 to 2.4 million in 2010 (U.S. Senate--Health, Education, Labor, and Pensions Committee, 2012).
National Post-Secondary Enrollment Decline

One unfortunate problem with the rapid increase of post-secondary institutions was that it was accompanied by economic decline and consumer saturation. In 2008, the United States entered what has been referred to as “the Great Recession” resulting from the subprime mortgage crisis. As Perry and Rumpf (1984) predicted 30 years ago, colleges and universities began to experience declining enrollment, increased competition, and changes in consumer preference. In addition, students, in this culture of accessibility, grew savvy, increasingly discerning, and more demanding as a consumer group. According to Knapp, Kelly-Reid, and Ginder (2012), during 2011, the United States reported its first total enrollment decline in higher education since 1996, and enrollment declined further in 2012, with an overall decline of 1.8% (National Student Clearinghouse Research Center, 2012).

National data have reflected a general interest in college attendance; however, actual enrollment numbers tell a slightly different story. From 2000 to 2010, the number of U.S. students ages 18 to 24 enrolled in college increased 6%, yet nearly 60% of individuals within this age range were not enrolled in college (U.S. Bureau of Labor Statistics, 2012). Consider this fact from the vantage point of a well-known state-supported institution: In the fall of 2012, 29,118 prospective students applied to attend college at the University of Wisconsin—Madison (UW); 54.6% of these prospective students were admitted, yet only 39.6% of those admitted actually enrolled (University of Wisconsin, 2013). While not all students who are admitted possess the financial resources to enroll, a relevant portion of those students who were admitted did not enroll, which
represents an enrollment yield loss of approximately 15%.

This decline in yield has not been limited to UW, nor is it a recent phenomenon. The National Association for College Admission Counseling (as cited in Clinedinst, 2008) found that from 2001 to 2007, the number of applications increased at about 75% of their reporting institutions, yet the enrollment yield rate (the percentage of applicants who actually enroll) at these same institutions declined by 3.9%. At the same time, the average per-student recruitment cost increased by $1,648. As a result, despite an increase in the number of students applying to colleges and universities, the number of students actually enrolling has been declining. Enrollments tend to fall, or “scale” when the overall economy improves and the demand for employees increases. Hoover (2013) identified widespread enrollment declines throughout the United States and growing concern among enrollment managers. Carlson (2013) also reported widespread institutional enrollment declines and advised institutions to examine and alter their enrollment practices or face further declines. According to Cameron (1983), managing this decline has been an important administrative function: “The management of conditions of decline, therefore, has become a major requirement of managers and administrators in institutions of higher education” (p. 359).

**Sunk Costs of Enrollment Declines**

A term derived from the business and economic literature, “sunk costs” are past expenses that have been incurred and cannot be recovered (Frank & Bernanke, 2006). Failure or inability to respond to changes in enrollment declines create sunk costs and operational deficiencies at colleges and universities of all sizes. Understanding the impact of these costs on the operations of these colleges and universities is necessary to maintain
adequate service levels and future recruitment abilities. However, Cameron (1983) found that administrators are generally not prepared to respond effectively to enrollment declines. When fewer students enroll and attend colleges, fewer dollars are available to support a variety of essential services (e.g., course offerings, instruction, guidance, administration, staff, extra curricular activities, and future recruitment). Whetten (1981) identified multiple examples of administrators emphasizing short-term resource allocation during enrollment declines instead of focusing on long-term strategies that ensure future enrollment. According to Whetten, resource allocation during times of enrollment decline represents a conservative approach to the problem that has been empirically shown to lead to further decline and even organizational insolvency. For each potential student who applies but does not enroll, colleges and universities face an unrecoverable financial loss, thereby influencing the amount of money available to use for recruiting in subsequent years. Because enrollment requires complex financial and budgetary considerations, cost/benefit analyses, such as a “break-even” analysis (Larimore, 1974) or an “elasticity coefficient” (Hoffman, 1986) can be used to assess whether an investment results in increased revenues after expenses. These analyses are key to effectively determining the functional relationship between sunk costs and investments.

The Recruitment Funnel

Grandillo (2003) has described recruitment theory and practice in terms of a funnel:

The recruitment funnel, where a high number of inquires of prospective students from numerous entry points narrows to and moves toward application and
ultimately a smaller number of matriculated students, is at the foundation of the college-recruiting theory. (para. 3)

Noel-Levitz (2009) has segmented the funneling process into stages (see Figure 1).

![Figure 1. The recruitment funnel.](image)

The funnel categorizes potential students based on their position in the admissions process—inquiries (the largest part of the funnel), applicants, completed-file applicants, admits/accepted, deposited/confirmed, and finally enrolled (the exit point of the funnel). At the point of enrollment (the exit point of the funnel), students begin the traditional matriculation process through the academic lifecycle. Although the concept of “matriculation” in British universities has been associated with a ceremony by which students formally become registered or persist into a university community (Venn & Venn, 1922), the United States has operated under a slightly expanded definition. In the United States, however, “matriculation” can refer to various segments of the enrollment process (post-funneling), including enrollment, registration, and academic progression. For the purposes of this dissertation, the term “pre-matriculation” is used to describe students as they move through the recruitment stages of the funnel process.
Funneling Costs

Until students reach the “enrolled” stage of the funnel, colleges and universities spend valuable operational dollars on prospects, inquiries, applicants, completed applicants, admitted students, acceptance, and orientation—none of which are guaranteed to produce a return on investment. In fact, in a nationwide survey, Noel-Levitz (2007) confirmed that the number of students who inquire about college but who do not enroll has been steadily increasing, thereby decreasing the return on investment in these stages of the funnel. These investment costs are typically incurred through various forms but generally can be placed into the following categories: recruitment staff members, events, campus visits, advertising, communication, search engine marketing, and traditional marketing (e.g., television, radio, print, direct mail). In a sample of more than 50 post-secondary institutions nationwide, The Primary Research Group (2010) reported a mean marketing recruitment budget of $471,878. Hypothetically applied to the UW example, approximately $70,781, or 15% of $471,878, would be considered sunk recruitment costs. These unrecoverable recruitment costs are in addition to 4 or 5 years of tuition loss for every student not enrolled. The expenses associated with recruitment are staggering and, when coupled with lost tuition, these expenses can be operationally debilitating for post-secondary institutions. The ability of institutions to increase the number of students who enter the recruitment funnel and actually enroll presents an opportunity to influence enrollment decline. As Cameron (1983) stated, institutions must take action to reverse this trend: “The conditions of decline do not dictate what organizations must do, but they do create a situation where some response is necessary” (p. 359).
Impact of Continued Enrollment Decline on the Recruitment Funnel

When recruitment funneling fails to yield enrollees, colleges and universities decline in enrollment and must respond. Cameron’s (1983) research of private-sector organizations indicated that conservative responses (e.g., budgeting/reducing resources, efficiency-oriented measures) are both ineffective and detrimental. In other words, according to Cameron (1983), if enrollment decline is to be reversed, “large adjustments will have to be made in our ways of thinking, in our habits and standards of decision making, and perhaps even in our institutions” (p. 362).

Enrollment yield certainly influences operational revenue at the institutional level, but it also has a ripple effect on U.S. workforce needs at the national level as well as global competitiveness at the international level. For every non-matriculated college recruit, the United States is faced with one less formally educated employee. While formal education is not necessarily an indicator of economic production, it does represent a vehicle and a gateway for socioeconomic mobility. According to Ramirez, “The skills gap in America has nearly reached a crisis point” (as cited in “Ask Bill Clinton,” 2013, para. 1). Additionally, for every student who enters the enrollment funnel but fails to enroll, the United States falls globally in its share of adults age 25 to 34 who hold academic degrees. According to a report from the Organization for Economic Cooperation and Development (OECD, 2012), the United States ranked 14th among 37 OECD countries in the percentage of adults in this age range who hold academic degrees. Steadily, the United States has been passed in higher education degree attainment by countries such as France, Belgium, Luxemborg, and Australia (OECD, 2012). The OECD report indicated that “because of the rapid expansion of tertiary [post-secondary]
education both in the industrialized world and in emerging economies, the U.S. is fast losing its advantage” (p. 1).

Addressing the decreasing number of students who complete higher education degrees in the United States begins with examining enrollment yield. Simple logic suggests that if colleges and universities are unable to advance students through the recruitment funnel, the total number of individuals who possess post-secondary degrees will decline. This decline results in a less-educated citizenry and can be capitalistically debilitating as well as socially destabilizing. However, Mitra (2011) suggested that strong educational systems result in positive quality-of-life cycles, strong labor forces, and lower crime rates, while weak educational systems result in social and economic problems. For this reason, among others, colleges and universities spend millions of dollars every year encouraging students to enroll. For example, Desrochers and Kirshstein (2012) estimated that the cost of Division I athletic student recruitment is approximately $6 billion. It is also for this reason that the U.S. Government invests so heavily in national financial aid assistance. According to the Congressional Budget Office, the United States federal government invested approximately $107.6 billion in education during fiscal year 2012 (as cited by the U.S. Department of Education, 2012.

Together, this research and information suggests that student enrollment drives national economic progress, global competition, and institutional operations.

**Cost to Recruit**

In a benchmark study, Noel-Levitz (2011) found the median cost to recruit an undergraduate student at 4-year private institutions was $2,185 per student, with a staffing ratio of one full-time employee (FTE) for every 33 new students. Four-year and
2-year public institutions spent approximately $457 per student with one FTE for every 117 new students, and a median ratio of one FTE to 198 new students (Noel-Levitz, 2011). Each time a potential student is admitted but fails to enroll, colleges and universities suffer short-term financial losses and long-term growth opportunities. No national data exist that indicate exactly how many students fail to enroll once they enter the recruitment funnel; however, the U.S. Department of Labor (2013) reported that nearly 34% of 2012 high school graduates who entered the recruitment funnel did not attend college. The decision not to attend college is merely a symptom of the growing need for further research on enrollment yield and the various stages within the recruitment funnel where students fail in reaching the point of enrollment. Capaldi (2011) reported that national enrollment yield rates have impacted operations, influenced enrollment, and threatened academic quality.

Enrollment yield needs to be examined before the decline reaches crisis status. According to the National Association for College Admission Counseling (as cited in Clinedinst, 2008), using data from the U.S. Department of Education, the average enrollment yield rate from 2001 to 2007 fell from 49.1% to 45.2% (Clinedinst, 2008). Each prospective student who does not persist through enrollment represents a loss of operational revenue for the institution. Recruitment and enrollment yield are generally the economic drivers of operational and expense budgets at colleges and universities. Negative yield fluctuations influence student services, faculty-to-staffing ratios, and educational delivery. The operational impact of students dropping out of the recruitment funnel cannot be understated.
Return on Investment

Institutions across all educational genres (e.g., public, private, proprietary) have been held increasingly accountable for return on investment by the various board and governance structures to which they report. According to a survey of members of the National Association of Colleges and University Business Officers, a new operational emphasis designed to increase return on investment and educational delivery will become the new norm for all institutions (Green, 2012). According to Green (2012), proprietary institutions experiencing declining enrollment will be required to take steps to ensure that they are maximizing enrollment yield in response to all inquiries as a method of achieving and maintaining sustainability. Private non-profit institutions also will be required to find creative and effective ways to produce stronger enrollment yields as a means of foundation growth. Public institutions, likewise, have sought methods to increase enrollment and degree completion numbers by effectively yielding high-interest prospective students to ensure continued access to state subsidies. Across all institutional types, the necessity to maximize yield has become paramount to institutional sustainability and progress.

Competition in the Marketplace

In addition to mounting financial pressures related to yield, competition to enroll prospective students likewise has increased. According to data published by the U.S. Department of Education, between 1996 and 2010, the total number of colleges and universities in the US increased from 3,231 to 4,495 (U.S. Department of Education, 2012). In economic terms, increasing the number of suppliers in order to secure business under more favorable terms is the very definition of competition (Smith, 1976).
Competition in higher education has expanded well beyond the historical brick-and-mortar delivery of educational products. Today’s students are now receiving education through virtual and online modalities. In fact, according to Allen and Seaman (2013), nearly 32% of all students enrolled in college-level courses are enrolled in at least one online class. Institutions that do not offer an online delivery option face a competitive disadvantage in the expanding marketplace and thus the possibility of further enrollment yield loss. The ability to act and think differently about the delivery of higher education is essential to an institution’s ability to usher students through the enrollment funnel successfully in the highly competitive marketplace of post-secondary education.

According to comments made by Cavanaugh, Floyd, and Strauss (2012) to the National Association of College and University Business Officers (as cited in Kiley, 2012), “If we are going to change how we deliver higher education, it is going to require new ways of thinking” (p. 1). High recruitment costs, enrollment declines, and increased competition (ground and online) are issues that should alert colleges and universities about the urgency of finding new ways of influencing persistence through the recruitment funnel.

**Instructional and Enrollment Calendars**

According to Johnson and Spradlin (2007), the American college system operated under a traditional academic calendar that was created based on agrarian traditions and urban needs. The summer season was reserved as a time to tend to crop harvesting, while fall and spring were devoted to matters of preparation, including preparation for educational instruction (Johnson & Spradlin, 2007). Davis (1972) stated that agrarian culture provided the impetus for the creation of the semester-based instructional system. This system divided the non-summer months into two 16-week periods for educational
use; eventually, the summer months were integrated for year-round education. This calendar system persisted with only minor modifications and inclusion of modular instructional periods (e.g., 4- to-8-week instructional periods). Modular instructional periods are shorter and accelerated, and they exist within a 16-week semester. Modular and accelerated courses are most common in career-based and technical-based institutions of higher education, although they have become increasingly more common within traditional systems. However, the enrollment calendar and opportunities to begin college at various points during the academic semester or academic year have yet to match the evolving instructional calendar.

Colleges and universities traditionally have spent the months leading up to the beginning of the academic year (typically in the fall) as a recruitment period in accordance with instructional practices based on the traditional agrarian fall start. For example, applications to attend college are submitted from September through December of the year prior to the anticipated start date (see Figure 1). Colleges review student applications from November through March and then notify students either of their acceptance or denial from March through April. If accepted, students then enter into a period of latency when they must wait for the traditional agrarian fall or spring semester to begin. Even with an advanced instructional calendar (i.e., an instructional calendar that includes accelerated and modular courses), traditional enrollment periods are established for fall, spring, and summer—one start date for each academic period, each with a latency or waiting period. The latency period can vary by institution, as dictated by institutional type, policy, and practice. It is common for proprietary institutions to move students through the recruitment funnel faster than public schools, private schools,
and non-profit schools. Often, students complete the application and acceptance stages concurrently; however, this concurrency does not eliminate the latency period between application and enrollment.

The latency period is a time period of pre-matriculation before students actually attend classes. For the purposes of this research study, “latency” was defined as the time within the recruitment funnel between application and enrollment. “Enrollment” was defined as having attended classes. Hossler, Schmit, and Vesper (1999) determined that during this latency period, the decision to attend college by students who have been accepted (application complete) but not yet enrolled is influenced by a variety of factors: (a) short-term employment opportunities, (b) perceived family commitments, (c) the perception of educational value, (d) personal investment, and (d) immediate needs—all of which are institutionally uncontrollable environmental factors. Well-documented and researched, these environmental influences have been confirmed as key factors that influence student persistence, retention, and attrition after enrollment has occurred (Astin, 1975; Bean & Metzner, 1985; Pascarella, 1980; Spady, 1970; Tinto, 1975). However, the topic of latency (i.e., time between application and enrollment) has been neglected—largely because it has been considered a pre-matriculation factor contained (and “hidden” to some extent) within the recruitment funnel and outside of the traditional agrarian instructional calendar. Persistence through the stages of the recruitment funnel drives enrollment yield, which in turn drives enrollment. Colleges and universities have suffered enrollment declines, budget cuts, and austerity measures, yet few have attempted to alter the latency period within the recruitment funnel. As Boulding (1975) suggested, if enrollment decline is to be reversed, institutions must adjust how they think and act upon
matters within their control, such as latency.

**Dollars and Sense**

Higher education research on persistence, retention, and attrition has focused primarily upon student characteristics only after students have exited the recruitment funnel (see Astin, 1984; Bean, 1980; Bean & Metzner, 1985; Braxton, Sullivan, & Johnson, 1997; Pascarella, Duby, Terezini, & Iverson, 1983; Pascarella et al., 1996; Pike, 1999, 2000; Pike & Killian, 2001, Tinto, 1986). Although informative, post-enrollment assessments do not reveal important information about potential students who do not persist through the funnel and who never enroll or attend classes. To maximize their investment in the recruitment process, colleges and universities depend upon enrolling a progressively increasing number of recruits to ensure that they recover their recruitment expenditures. Conducting research on student attributes after students have enrolled is informative; however, those attributes are uncontrollable factors. Additionally, research on persistence, retention, and attrition accomplishes very little in terms of influencing the “front-end dollars” that need to be recovered from sunk recruitment costs and to replenish financial losses due to attrition.

**Optimizing the Enrollment Funnel**

Samuelson (1948) outlined a general economic theory focused on maximizing the behavior of agents, which asserts that both producing agents and consumer agents maintain an underlying goal of optimization. He called it the “optimization principle.” Applied to recruitment, colleges and universities (producing agents) seek to maximize student enrollment yield. At the same time, students (consumer agents) seek to attend college (ultimately graduating). Consumers allocate their income in such a manner as to
maximize their satisfaction from consuming those goods and services purchased at existing market prices. Producers exist to convert inputs into desired goods and services in an efficient manner. Given that output prices and factors are determined in competitive markets, efficiency means exploiting production technology to the greatest extent possible. Ruby (2003) explained that profits earned by entrepreneurs represent the reward for taking risks (i.e., facing an uncertain demand for outputs) and achieving efficiency in production (i.e., relative to competing producers)—profits that are at least equal to what the entrepreneur could earn by working for someone else. Students who complete a college application seek to optimize their satisfaction (i.e., desire to earn a degree) from their transactions (i.e., enrollment) with colleges and universities (i.e., producing agents). Likewise, colleges and universities seek to convert their recruitment dollars in an efficient manner given a competitive marketplace and sunk costs.

**Conceptual Framework**

The conceptual framework for this study is intertemporal choice—an economic model of thought. Intertemporal choice is an individual’s preference about how to negotiate well being between two moments in time (O’Donahue & Rabin, 2000). Students within the recruitment funnel seek to trade in their current state of well being, whatever that may be, with an anticipated state of optimized well being achieved through degree attainment.

All intertemporal choices come with an opportunity cost and the accompanying immediate impact of the decision made. Durlauf and Blume (2007) indicated that an opportunity cost reflects the fundamental economic law of interdependence between the volume, structure, and intensity of needs, on one hand, and the quantity, quality, and
structure of resources on the other hand (p. 260).

The level of opportunity costs, as it relates to higher education enrollment, not only involves explicit costs (e.g., tuition, books, and fees associated with attendance), but it also comes with a differing level of implicit costs dictated by age, time, and immediacy. Non-traditional students, defined for the purposes of study as being 5 years or greater removed from completion of a high school diploma or general equivalency diploma (GED), have higher opportunity costs than traditional students, being 4 years or less removed from completion of a high school diploma or GED, when deciding to attend college. Non-traditional students, generally, have more access to employment opportunities, greater needs for immediate earnings, and less time to reach the end goal of employment (i.e., retirement). In addition, they are more likely to be influenced by immediate needs. Likewise, non-traditional students, simply by virtue of time, generally have gathered a higher opportunity set of experience in the workplace, exposure to more events in life, and assets as a result of networking. Traditional students, however, have lower opportunity costs associated with higher education attendance. Traditional students, generally, have fewer access points to employment, are less influenced by immediate needs, possess fewer requirements associated with stronger wage earnings, and have more time to reach retirement. Becker (1997) has classified education as a good “with large gains to be waived” (p. 119), given the fact that education consumes time and that the opportunity cost is unique to the learner’s classification. Enrollment for traditional and non-traditional students is a result of choice accompanied by differing levels of opportunity costs.

Intertemporal choices can be either time-consistent or time-inconsistent. Time-
consistent choices are predicated on the assumption that once a decision is made, it will remain consistent, impacted only by exponential discounting represented as a discounted utility function (Fisher, 1930). Applied to the intertemporal choice to attend college, prospective students make a choice to apply and enroll in (attend) college in order to optimize long-term preferences (e.g., experience a better life) associated with degree attainment. This choice, if it is time-consistent, suggests that students’ decisions to apply and enroll will remain consistent between the point of application and the point of actual enrollment (i.e., after the latency period), being influenced only by exponential discounting. The time-inconsistent choice, however, presumes that individuals experience self-control problems and prefer immediate optimization (O’Donahue & Rabin, 2000). This choice (time-inconsistent) suggests that students may apply to attend college; however, when the latency period is over, students operate under a different set of optimization preferences and therefore make different intertemporal choices about enrollment. For example, students may complete an application to attend college in pursuit of long-term preferences; however, after the latency period ends and enrollment arrives, their immediate optimization needs (e.g., the need to address immediate personal problems, the need for employment, the need to care for others) override their long-term preference. This intertemporal choice is time-inconsistent. It would stand to reason that because opportunity costs of traditional and non-traditional students are different, the degree to which their behaviors are time inconsistent may likewise be different.

Time-consistent theory, as applied to the recruitment funnel, suggests that students who complete an application to attend college and are accepted will subsequently enroll and attend, regardless of the latency period between application and
enrollment. On the other hand, time-inconsistent theory, as applied to the recruitment funnel, suggests that after a period of latency and the arrival of alternative opportunities, applicants choose not to attend. Latency allows time for alternative opportunities to become available to applicants, thus increasing the likelihood of applicants choosing not to attend.

Varian (2010) noted that the optimization principle holds that consumers will make choices that maximize their happiness or utility. The choice to apply and enroll in college to achieve happiness or utility through degree completion, and its accompanying value, has been altered by technology and consumer choice. Optimization is not confined merely to physical products; it can be applied also to conduits that have the capacity to attain desired outcomes, such as the delivery of higher education. Intertemporal utility is the utility one gains from consuming goods and services now and consuming goods and services in the future. That is, consumers trade off present consumption for future consumption subject to their constraints (e.g., income and wealth) in order to maximize their lifetime utility. For most students, enrolling in classes at a university is an investment good. In terms of intertemporal utility, this means foregoing present consumption in order to gain the human capital needed to access higher-paying opportunities in the future and hence consuming more in the future and thereby achieving a higher lifetime utility.

The new reality in higher education is that rapid growth has occurred both in the number of post-secondary institutions available in which to enroll as well as in new technological methods of delivering educational products. Technology has introduced new delivery methods, such as distance education and massive online open content
instruction—again, to meet producer and consumer optimization desires. Contemporary educational choices for students are a natural byproduct of education in a growing capitalistic society. As consumer agents, students seek to optimize their happiness or utility in life through college enrollment. Enrollment is an investment in human capital designed to increase options available in the future. However, this desire may not be time-consistent due to external factors that may place other utilities or preferences of optimization in front of it. Longer periods of latency within the recruitment funnel provide opportunities for external factors to influence student preferences, thereby causing students to fail to persist through the recruitment funnel and ultimately enroll. For example, students may submit an inquiry to a college as means of reaching long-term goals and thus apply; however, as the latency period between application and enrollment occurs, a different preference that offers a greater happiness, or utility, may be established. The Phelps and Pollak (1968) time-inconsistency model would suggest that students’ desire for happiness or utility is easily influenced by external factors as opposed to long-term gain and desire. Time-inconsistency theory demonstrates students’ inability to resist the influence of external factors over long-term gain. A college degree, in most cases, is not a consumable good; rather, it is a capital good. Put simply, according to time-inconsistency theory, students are time-inconsistent consumers who are easily influenced by external factors and prefer short-term decisions of utility and optimization.

Colleges and universities have a strong tendency to resist change and alter their modes of instructional operation. However, the current national enrollment decline should be cause enough for institutions to consider the idea that students are no longer forced to wait on traditions of enrollment. Instead, prospective students operate in a
world of optimization, options, rapid delivery, and rapid response. If institutions are unable to move quickly, students may change their preference to attend (a reflection of time-inconsistent behavior), possibly resulting in enrollment declines.

**Statement of the Problem**

The higher education marketplace in the United States has changed. Competition has increased, and modes of instructional delivery have changed to meet demand, yet enrollment at post-secondary institutions in the United States has been declining. Students have not persisted through the pre-matriculation funneling stages of the enrollment process with the same consistency as they have in the past. If changes and new approaches to the traditional enrollment process are not explored, declines in enrollment are likely to continue, causing adverse impact to some institutions.

Post-secondary institutions have operated under the time-consistency model of thought since the time when the United States was considered an agrarian society. This model of thought, however, does not account for the uncontrollable external factors that occur during the latency period—possibly an explanation for enrollment decline within the recruitment funnel. Latency creates an opportunity for a differing set of intertemporal preferences to influence the decision to attend college after students have applied.

Institutions have assumed that when students decide to enroll in college, they will do so regardless of any latency (i.e., time lapse between their application date and their actual enrollment date). In other words, students are recruited at one point in time. They apply; wait to start; and then, at a delayed point in the future, they enroll (attend)—an approach that aligns with time-consistent theory and the traditional agrarian instructional calendar. Although institutions recently have begun to add more frequent start dates, (using
modulars and parts of terms), these schedules generally have followed the traditional agrarian model and have ignored students’ ever-changing preferences of optimization.

**Purpose Statement**

The purposes of this dissertation were (a) to assess the period of latency between application and enrollment and (b) to determine whether students would be more likely to persist through the recruitment funnel if institutions altered their enrollment calendars. Simple economic theory and national research has indicated that students, as consumer agents, desire to attend college. Likewise, colleges and universities, as producing agents, desire, and need, students to attend as a simple matter of business survival and product optimization. However, national enrollment data have revealed a disconnect between the two—that is, an increase in student applications but fewer attendees (i.e., lower enrollment yield).

Higher education in the United States has created a recruitment and enrollment system that has not kept pace with the evolving instructional marketplace. Most post-secondary education institutions operate under the economic premise of time-consistency—that is, students who desire to attend college will do so regardless of the influence of latency. If enrollment decline (i.e., enrollment yield) is to be addressed, institutions must think and act differently than they have in the past. The researcher sought to determine the influence on an institution of operating from a theory of time-inconsistency rather than a theory of time-consistency. In other words, the purpose of this study was to determine whether students were more likely to persist to the end of the recruitment funnel (enrollment) if institutions altered their enrollment calendars and shortened the latency period between application and enrollment.
The researcher reviewed data from a single-proprietary institution comprised of multiple campuses located throughout the eastern and southern portions of the United States to determine the influence of latency, within the recruitment funnel, upon yield. The findings will serve as a starting point for institutions to explore their own controllable influence over enrollment yield by optimizing the satisfaction gained from choosing enrollment subject to the constraint (i.e., influence of uncontrollable external factors) imposed by latency (i.e., time period between application and enrollment). The multi-campus proprietary institution referred to in this study is hereafter referred to as “Career College” to preserve confidentiality. Various campus locations will be identified by their home state, if applicable.

**Research Questions**

The following research questions guided this study:

*Research Question 1:* Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature six start dates and (b) school years that feature 12 start dates?

*Research Question 2:* Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) in (a) school years that feature six start dates and (b) school years that feature 12 start dates?

*Research Question 3:* Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5
years or greater removed from completion of a high school diploma or GED)?

Research Question 4: Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED)?

Significance of the Study

Examining and analyzing latency and student persistence within the recruitment funnel, and through the lens of economic theory, will add to the current higher education literature base. Beneficiaries of the results will include university business officers, enrollment managers, admissions representatives, and student service specialists. University business officers will be able to use the findings to determine key points of return on investment while minimizing sunk costs. Enrollment managers will be able to identify key points of enrollment yield loss within the recruitment funnel and thus put measures in place to maximize student persistence and retention while minimizing attrition. Admissions representatives may also use the results as a starting point in identifying other institutionally controllable factors that may influence enrollment yield rates. Student service specialists, likewise, will gain a better understanding of the influence of latency on the student decision-making process. Colleges and university administrators will gain a greater awareness of the recruitment funnel, thereby providing an opportunity to possibly impact enrollment declines.

Limitations and Delimitations

The results of this study should be interpreted with an understanding of
limitations imposed through a single-institution study. Because Career College is located across a diverse geographic area, points of relevance within the recruitment funnel are mirrored across all campuses. However, recruitment funnels generally vary from institution to institution and exhibit unique characteristics that influence enrollment yield. The application of findings provides a starting point in exploring the concept of latency in the recruitment funnel. A second limitation is that altering the academic calendar to influence latency does not negate uncontrollable external influences; rather, it merely alters the point of influence and places the desired utility of attending college in the hands of the consumer agent sooner.

**Definition of Terms**

For the purposes of this study, the following definitions were used:

*Acceptance/Accepted:* The status of an applicant who has unconditionally met the necessary requirements for entry into Career College.

*Acceptance Date:* Also referred to as “date of acceptance,” the acceptance date reflects the date on which the applicant unconditionally met the necessary requirements for entry into Career College and was accepted.

*Applicant/Application:* A potential student who has submitted a fully completed application to Career College and has paid, or made arrangements to pay, the enrollment fee.

*Application Date:* The date on which the applicant submitted a fully completed application to Career College and paid, or made arrangements to pay, the enrollment fee.

*Attrition:* The failure of students to attend classes after they have matriculated.

*Enroll:* The actual act of having attended classes at a postsecondary institution of
higher education as a college or university student. This definition does not apply to students who are high school students taking college courses.

*Intertemporal Choice:* An individual’s preference about how to trade off well being between two moments in time (O’Donahue & Rabin, 2000).

*Latency:* The time frame within the recruitment funnel between application and enrollment.

*Matriculation:* The time frame after a student has enrolled at a postsecondary institution of higher education.

*Non-Traditional Student:* A college student 5 years or greater removed from completion of a high school diploma or general education diploma (GED) equivalency.

*Opportunity Costs:* The value of a foregone activity or alternative when another item or activity is chosen (Henderson, 2008).

*Persistence:* The act of continuing to matriculate through the recruitment funnel.

*Pre-Matriculation:* The time frame when potential students are being recruited to attend a post-secondary institution of higher education but have not yet attended classes. More specifically, it represents any point in time within the recruitment funnel.

*Recruitment Funnel:* The time frame during which potential students are recruited to attend a postsecondary institution but have not yet enrolled. The entry point of the recruitment funnel, for the purposes of this dissertation, is after students have applied.

*Retention:* The act of encouraging students to persist in their educational pursuits after matriculation.

*Sunk Costs:* Past expenses that have been incurred and cannot be recovered (Frank & Bernanke, 2006).
Time-Consistency: Choices that are predicated based on the assumption that once a decision is made, that decision will remain consistent and be influenced only by exponential discounting represented as a discounted utility function (Fisher, 1930).

Time-Inconsistency: Choices that presume that individuals have self-control problems and prefer immediate optimization over long-term preferences (O’Donahue & Rabin, 2000).

Traditional Student: A college student 4 years or less removed from completion of a high school diploma or general education diploma (GED) equivalency.

**Conclusion**

As a matter of financial sustainability, institutions that have been challenged with enrollment decline should examine possible losses incurred within the recruitment funnel due to latency. Losses within the recruitment funnel create unrecoverable sunk costs that can influence both short- and-long term operational funding.

The forthcoming chapters of this dissertation present relevant research from the higher education literature base regarding persistence, retention, and attrition. A firm understanding of past and current research establishes a firm foundation for the practical application of the results of this study. This study provides a basis for using the conceptual framework of time-inconsistency to explore the concept of student as consumer and the associated intertemporal choices.

In Chapter 3, the researcher presents the methods. Using a secondary data set provided by Career College, the researcher conducted statistical analyses to determine whether including additional start dates (i.e., reducing the latency period within the recruitment funnel) resulted in a statistically significant difference in the mean number of
latency days between application and enrollment. Specifically, independent samples $t$-tests and chi-square cross tabulations were conducted. Additionally, Chapter 3 provides an explanation of the research design, the variables, and the data analysis procedures. Chapter 4 presents the statistical procedures used, a description of the data, and the results of the data analysis. Chapter 5 concludes with a summary of the results, a discussion of relevant findings within the study, recommendations for practice, and conclusions and recommendations for future research.
Chapter 2

Review of Literature

This chapter provides a scholarly foundation of research that supports the reasons why latency and enrollment yield are important topics in higher education. Further, this literature review provides a pertinent synthesis of higher education literature related to persistence, retention, and attrition. This literature review includes information categorized into the following sections: application of theory; persistence, retention, and attrition theory; time consistency theory; and conclusion.

Application of Theory

According to Hossler and Bean (1990), the need for practical application of theory has been evidenced by the sunk costs post-secondary institutions incur throughout recruitment, application, and enrollment. According to Crockett (2012), one of the most common questions about enrollment optimization relates to recruitment expenditures. Public and private non-profit institutions generally have been reluctant to share specific recruitment expense data because this largely has been considered proprietary information. However, one way to understand and estimate the importance of recruitment and enrollment is through the percentage of staff members dedicated to the recruitment and enrollment process. Staffing benchmark data gathered by Noel-Levitz (2009) have indicated that 58% of enrollment personnel at 4-year private colleges and 46% of enrollment personnel at public 4-year colleges are directly involved in recruitment activities. Held to tighter reporting and accountability standards, proprietary institutions reported to the U.S. Senate Committee on Health, Education, Labor and Pensions (2012) that they invested nearly 24% of their revenue directly into recruitment and related
enrollment management activities. The investment in recruitment and enrollment strongly suggests the importance of ensuring high rates of recruitment and enrollment optimization.

Kuh, Kinzie, Schuh, Whitt, and Associates (2005) have noted that the proprietary sector has long been known as the leader in identifying and adapting best practices of optimization to achieve results-oriented outcomes. Consistent with the noted increase in number of institutions, the body of research that has been conducted on educational institutions within the proprietary sector likewise has grown (see Bailey, Badway, & Gumport, 2001; Kelly, 2001; Moe, Bailey, & Lau, 1999; Newman, 2001). Knapp, Kelly-Reid, and Ginder (2011) reported that of the 6,883 Title IV postsecondary institutions in 2009, 44% were listed as proprietary, 29% were listed as public, and 27% were listed as private non-profit. Kelly (2001) stated, “Once considered well outside of the mainstream of America’s higher education system, for-profit degree-granting institutions have emerged as an integral and increasingly influential part of the system” (p. 1). Ruch (2001) suggested that proprietary classrooms function just as they would in traditional institutions; however, proprietary classrooms also operate much like a business that seeks optimization, efficiency, and effectiveness in meeting consumers’ needs. The motive and desire to optimize outcomes, financially, is fundamentally different than the motives and desires of traditional institutions (Hawthorne 1995; Lee & Merisotis, 1990). The no-frills education delivered by proprietary institutions provides a true consumer environment in which to assess such a different way of doing business (e.g., altering the academic calendar) and determine the impact of latency on yield.
Persistence, Retention, and Attrition Theory

Retention and attrition theory, which has been reported largely in the sociological student integration literature, has varied only slightly during the past four decades (Braxton et al., 1997). Spady (1970) developed a sociological model explaining why students fail to persist after having matriculated into a college or university setting. This model tied student academic success, or lack thereof, to the degree of commitment to academic success exhibited by students and how likely students were to remain enrolled. According to Spady, the academically weaker and the less involved students were, the more likely they were to drop out of college. Spady determined that the following attributes were associated with academic performance: (a) background characteristics, including high school performance, academic potential, and normative congruence; (b) institutional commitment and social support system (life stability); and (c) students’ satisfaction with their learning experiences.

Spady’s (1970) student attrition work was rooted in the 1897 sociological behavior research of Émile Durkheim. Durkheim (1951) postulated that levels of social integration were correlated with suicide rates. According to Shneidman (2001), the basis of social integration suggests that lower levels of integration cause individuals to leave society via suicide. The greater the integration, the less likely individuals are to leave society (commit suicide). Spady (1970) stated, “Dropping out of college is clearly a less drastic form of rejecting social life than suicide” (p. 78). Spady clearly acknowledged that suicide and leaving college were not the same; however, the similarities and reasoning behind forgoing an activity (e.g., life or attending college) were notable. Spady’s (1971) theory was tested in 1965 at the University of Chicago. During a four-
year test period in which Spady conducted research on matriculated undergraduate students, he determined that as long as external influences were held constant, matriculated students who did not integrate academically were more likely to leave the college environment.

Tinto (1975) critiqued Spady’s work, which was foundational in the field of retention and attrition. However, according to Tinto, Spady oversimplified the numerous complex factors associated with attrition and overlooked the importance of academic and social interactions. Spady’s work has generated a substantial amount of research and model development. According to Tinto, it provided an informative model; however, the basis for Spady’s model was matriculated students, not pre-matriculated students; thus, it is not a fully accurate model to help identify which actions institutions might consider in attempting to influence enrollment yield.

Rootman (1972) developed a model that expanded upon Spady’s research and illuminated the true complexity of individuals’ characteristics within the context of institutional expectations. Rootman explored attributes of military cadets who voluntarily withdrew from a military academy. Using a stepwise multiple regression analysis, Rootman compared sociological variables and found eight attributes that could explain a statistically significant portion of the variance in the dependent variable (i.e., voluntary withdrawal). By isolating the variables, Rootman also found that the time of withdrawal created a different set of preferences that individuals exhibited when making intertemporal choices about whether to continue. In other words, after isolating uncontrollable pre-existing student attributes, Rootman determined that the following factors influenced enrollment yield: (a) situational context at the relative moment the
decision to withdraw was made, (b) levels of stress, and (c) levels of fitness.

Tinto (1975), like Rootman, followed in the tradition of the sociological integration work of Durkheim. However, Tinto’s full body of work, 1975 through present day, has become the standard by which nearly all theoretical (sociological and psychological) perspectives and studies have been measured (Braxton et al., 1997; Pascarella & Terenzini, 2005). Tinto (1993), along with many who have tested the 1975 social integration model, found that after students matriculate, they must separate from their previously associated social settings, transition to their new environment, and integrate with new groups by adopting new values and behaviors of the new group. Further, Tinto’s work emphasized the fit between students and the institutions they attend. In other words, if students’ pre-existing attributes and commitment levels fit the academic system of their chosen institution, the likelihood of integration, and thus persistence, is greater (Tinto, 1975, 1993). Tinto (1975) specifically stated, “Other things being equal, the higher the degree of integration of the individual into the college systems, the greater will be his commitment to the specific institution and the goal of commitment” (p. 96). He also stated, “The frequency and quality of contact with faculty, staff, and other students have repeatedly been shown to be independent predictors of student persistence” (Tinto, 2007, p. 5). Tinto’s model has undergone extensive testing and has been validated and confirmed. Pascarella and Terenzini (1979) confirmed the influence of institutional involvement on student commitment and persistence at 4-year institutions. Various researchers likewise have conducted studies that validated Tinto’s model within non-traditional and two-year college settings (see Pascarella, Duby, Miller, & Rasher, 1981; Pascarella, Duby, Terenzini, & Iverson, 1983; Williamson & Creamer,
Critics of the integration model, including Tinto himself (1993), purport limitations of the theory and failure to distinguish between factors. For example, the National Center for Education Statistics (2005), has clarified that simply identifying attributes does little to influence outcomes. Further, Braxton et al. (1997) compared and contrasted peer-reviewed studies that used the social integration model and identified only partial support for it, primarily in residential university settings. Tinto’s integration model is matriculation-based, which suggests that it is capable of informing institutions about some factors that promote student persistence of traditional residential students after enrollment has begun. Pre-matriculation enrollment yield loss, however, occurs before enrollment ever begins. Therefore, institutional use of such informatics is limited in its practical application.

During the past 38 years, Tinto has revised his model to update his original perspective. In particular, Tinto (1993) added the concept of time into his original model. The addition of time into the student integration model acknowledged the importance of a latency period before integration as a factor in retention. Latency, in this context, has been used to describe the interval between enrollment and integration, whereas it also has been used to describe the interval between application and enrollment in the pre-matriculation stage. Tinto’s reference to time, as an institutionally controllable variable, provided a central component of this dissertation.

The integration model logically led to psychological involvement theory. Researchers began to study not only the reasons students left colleges or universities but also why they remained. Astin (1984) established a behavioral student involvement
theory much less sociological and complex than others before and after him, including those of Spady (1970), Rootman (1972), Tinto (1993), and Braxton et al. (1997). Astin (1984) defined student involvement as “the amount of physical and psychological energy that the student devotes to the academic experience” (p. 518). Astin (1999) explained that his model was simple and did not need to “draw a maze consisting of dozens of boxes interconnected by two-headed arrows to explain the basic elements of the theory” (p. 518). Known as student involvement theory, Astin’s model proposed a simpler theory suggesting that every significant effect on student persistence can be explained in terms of involvement (Astin, 1984). The five attributes of Astin’s (1999) involvement theory include the following: (a) effort of involvement into college life, (b) continuous involvement, (c) quantitative and qualitative measurements of involvement, (d) educational program involvement, and (e) effectiveness of the educational program. Research has confirmed Astin’s work identifying the positive influence of involvement on all aspects of college life, including objective measures of academic progress as well as subjective measures of success (see Endo & Harpel, 1982; Pascarella et al., 1983; Pascarella et al., 1996; Pike, 1999, 2000; Pike & Killian, 2001). Although it has resulted in positive outcomes, the research on student involvement theory has been unable to identify consistent relationships between pre-existing student characteristics and involvement during college (see Endo & Harpel, 1982; Pike, 1999, 2000; Pike & Killian, 2001).

Astin’s (1999) premise, though primarily associated with involvement, identified the capacity for institutions to influence student outcomes through policies and practices. Pike and Kuh (2005), through their research, confirmed that “the most important
institutional factors are thought to be the policies and practices adopted by institutions to increase student engagement” (p. 187). The findings and revelations of Pike and Kuh corroborated the limited capacity of informatics (e.g., pre-existing student attributes) to influence or predict student retention. The importance of institutionally controllable variables has been noted to be of such relevance that it transformed the most widely used engagement survey in the United States, the National Survey of Student Engagement (NSSE) (Kuh, Pace, & Vesper, 1997). The NSSE is the standard by which higher education research has informed theory and practice. The practical application of theory is the transformative tool that has the ability to influence enrollment decline, as it has persistence, retention, and attrition.

Pascarella (1980) developed a single-institution attrition theory heavily influenced by institutional structure characteristics. This theory identified four primary attributes of influence on persistence: (a) student background, (b) institutional characteristics, (c) student-to-faculty contact, and (d) other college experiences. The work of Pascarella centered upon student-to-faculty non-classroom contact and suggested that the influence of this contact upon student persistence was essential. Pascarella’s research determined that the more non-classroom contact between students and faculty members, the more likely students were to persist in their college education. Critics, however, have noted that Pascarella’s work was conducted at a single institution and is thus considered to have limited applicability (Kuh, Kinzie, & Buckley, 2006). Much like the works of others, Pascarella’s research is matriculation based. However, his research provided insight into the influence of institutionally controllable factors upon persistence and attrition. Pascarella’s model identified the influence that institutions have within the recruitment
funnel (i.e., institutional characteristics, as opposed to the uncontrollable pre-existing student attributes identified after matriculation).

Bean and Metzner (1985) proposed an attrition model that incorporated external factors influencing students. These external variables, often termed “environmental factors,” included finances, family responsibilities, employment, and external social influences. The environmental factors identified provided greater insight into the significant yet incomplete involvement and integration theories. Bean and Metzner statistically associated unstable environmental factors with the propensity of students to withdraw from college after matriculation. At the same time, they also were able to associate stable environmental factors with persistence among non-traditional students. Although Bean and Metzner’s research helped to explain variance in the earlier research, their work also was matriculation-based.

Retention, persistence, and attrition theories offer very similar perspectives about pre-entry characteristics and institutional fit. Cabrera, Nora, and Castandea (1993) determined that an integrated application of the models influences student persistence in an effective and practical manner. According to Cabrera et al., the intent to persist was identified as the variable with the most influence on student persistence. This variable was followed by grade point average, institutional commitment, surrounding support system, goal commitment, academic integration, attitude toward finances, and social integration (Cabrera et al., 1993). Persistence, in all models, represented a series of complex interactions over time.

The models of both Bean and Metzner (1985) and Pascarella (1980) regard persistence as the result of a complex set of interactions over time. The two models argue
that precollege characteristics affect how well the student would subsequently adjust to
the institution. Further, the two models argue that persistence is affected by the successful
match between the student and the institution: “A close examination of the two
theories... apparently indicates that a high degree of overlap exists across the two
theories in terms of organizational factors (courses and academic integration) and
commitments to the institution (institutional commitment, institutional fit, and quality)”
(Cabrera et al., 1993, p. 125).

Examined and tested in their various forms, persistence, retention, and attrition
theories have examined pre-existing student attributes and their correlation with student
continuance after matriculation. Some models have demonstrated positive correlations,
while others have found weak associations. Although much of the higher education
literature on persistence, retention, and attrition has been matriculation based, researchers
have identified two important findings. First, researchers have confirmed that institutions
have the capacity to influence student decisions by altering institutionally controllable
factors related to policy and practice (Pascarella, 1980; Pike & Kuh, 2005). Secondly, use
of the enrollment calendar is a traditional practice that has been largely unaltered since
agrarian society and has extended the length of time between application and enrollment.
The factor of time has been referenced in the higher education research literature on
persistence (Tinto, 1993), retention (Pascarella, 1980), and attrition (Astin, 1984), yet it
has gone untested in a practical application (Kuh et al, 1997).

**Time**

Wertenbroch, Vance, Barnhart, and Newton (1998) noted that economists are well
aware of the influence of time on purchasing decisions. Hoffman (1986), likewise, has
stated that the business world has long known that consumers are influenced by time. However, in the field of higher education, the study of time has been relegated to a footnote in the enrollment decision process. In a practical application of theory, institutions should consider enrollment from the perspective of behavioral economics as a decision by students, who are considered “optimizing consumer agents.” The longer it takes consumers to act upon a desire for a product, the more likely that the decision will be reconsidered. The same economic behavior may hold true in the case of pre-enrollment yield loss. The time, or latency, between application and enrollment may be causing losses in enrollment yield.

**Time Consistency Theory**

According to Tobin (1987), American economist Irving Fisher, a pioneer in neoclassical economics, determined that economic value was not only a function of goods and services purchased or sold but also a function relative to the moment in time in which a purchasing decision takes place. The decision for students to weigh costs and their relative benefits at varying points in time is a product of intertemporal choices. Traditional intertemporal models have assumed that choices are time-consistent. When applied to enrollment, these traditional models suggest that the decision of students to enroll and attend college to achieve long-term gain remains the same at the time they apply for college as at the time they enroll or attend classes and are influenced only by exponential discounting represented as a discounted utility function (Fisher, 1930). Durlauf and Blume (2007) noted that the theory of discounted utility generally has been the framework used for analyzing intertemporal choices when describing positive and normative economics. In analyzing the standard time-consistent decision of potential
students, higher education may need to consider the possibility of enrollment being a time-inconsistent decision.

First explored by Phelps and Pollak (1968) in their work *On Second-Best National Saving and Game Equilibrium Growth*, the theory of time-inconsistency purports that as time passes, individuals are less likely to remain committed to a long-term altruistic goal. However, the modified Phelps and Pollak model (1968) addresses time-inconsistency preferences. Most commonly studied when investigating specific behavior (e.g., procrastination, addiction, and weight loss), time-inconsistency suggests that decisions are made relative to a given set of preferences at a given moment in time. Time-inconsistent behavior occurs when decision makers regret a decision they have already made. For example, students decide to attend college and apply; however, as time passes (latency), they alter their choice relative to their preferences at that given moment in time. This type of behavior is not representative of time-consistency theory. Instead, as time advances, utilities (external factors) influence the actualization of their original decision, thereby reflecting a new set of preferences relative to that moment in time. Ainslie’s (1975) work on hyperbolic discounting has described the tendency to discount such short-term gains in the near future. Decision makers have a tendency to inaccurately judge future marginal utilities by assuming that they will remain steady across time. It is common in today’s fast-paced society, and evident in the behavioral literature, that immediate preferences are more likely than a long-term impact of future marginal utility to influence decision-making processes.

Contemporary educational choices are a natural byproduct of education in a competitive marketplace and clearly a trait of today’s technologically advanced
consumer. Thus, for every day between application and enrollment, the decision to attend college is influenced by a multitude of external factors. For example, students may prefer to attend college as a means of reaching long-term life goals; however, as time passes a different set of preference emerges.

The intertemporal model of time-inconsistency has drawn on experimental research and common intuition to explain why decision makers choose short-term rewards over long-term gain (Ainslie, 1992; Lowenstein & Elster, 1996). For example, Fang and Silverman (2009) used data from the National Longitudinal Survey (NLSY) of 1979 to provide insight into the decision-making process that participants of federal welfare programs used to make their decisions. The study examined decision makers’ trade-offs between (a) short-term gains that included low-wages and immediate access to welfare benefits and (b) long-term benefits of higher wages and work experience. The investigation provided a setting in which to evaluate the importance of time-inconsistency. Specifically, Fang and Silverman (2009) concluded the following:

The trade-off between the short-term costs of entering the labor force at a low wage relative to the welfare benefit, and the long-term reward of higher wages from the accumulation of work experience, may generate problems of self-control. (p. 1044)

The analysis of self-control problems in Fang and Silverman’s (2009) investigation parallels student latency exceptionally well (see Table 1). External factors that influence the decision-making process are inevitable and uncontrollable. However, their influence in the decision making process may be able to be altered.
### Table 1

*Comparison of Business Environment and Academic Environment*

<table>
<thead>
<tr>
<th>Decision Maker</th>
<th>Welfare Recipient</th>
<th>Prospective Student</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preference</strong></td>
<td>Higher wages and work experience</td>
<td>Higher wages and work opportunities</td>
</tr>
<tr>
<td></td>
<td>Over time, advance in wage rate and work experience</td>
<td>Over time, enroll in college to advance in wage and life opportunities</td>
</tr>
<tr>
<td><strong>Intertemporal Choice</strong></td>
<td>Take steps to advance beyond current socioeconomic position in life by applying to workforce or maintain current lifestyle</td>
<td>Take steps to advance beyond current socioeconomic position in life by applying to college or maintain current lifestyle</td>
</tr>
<tr>
<td><strong>Latency Period</strong></td>
<td>Experience time delay from application to actual employment</td>
<td>Experience time delay from application to enrollment (attendance)</td>
</tr>
<tr>
<td><strong>Uncontrollable External Factors Occur</strong></td>
<td>Necessity of benefits to sustain basic survival needs</td>
<td>Necessity of employment to support family and earn income</td>
</tr>
<tr>
<td><strong>Time-Consistent Decision</strong></td>
<td>Employment opportunity to enter workforce at low wage rate, coupled with reduction in welfare benefits, arrives and welfare recipient enters work to advance position in life</td>
<td>Enrollment opportunity to attend college, coupled with life’s current reality of family responsibilities, need for income, etc., arrives and prospective student enrolls to advance position in life</td>
</tr>
<tr>
<td><strong>Time-Inconsistent Decision</strong></td>
<td>Employment opportunity to enter workforce at a low wage, coupled with reduction in welfare benefits, arrives and welfare recipient forgos the choice to work</td>
<td>Enrollment opportunity to attend college, coupled with life’s current reality of family responsibilities, need for income, etc., arrives and prospective student forgos the choice to enroll</td>
</tr>
</tbody>
</table>

### Conclusion

Research conducted on attrition and persistence in the field of higher education has provided important information and insight into common student attributes associated with matriculation. The results have led to the development of improved post-enrollment student services; however, this research has done little to practically address pre-enrollment yield losses. Enrollment managers recently have been faced with the realities of shrinking budgets, rapidly changing student demographics, and a continuously evolving educational product delivery method. To address these evolving trends, new models of enrollment need to be tested and explored—models that are rooted in a
theoretical base outside of the higher education literature. Behavioral economic theory and intertemporal choice provide a thought-provoking approach that enables enrollment managers to better understand and accommodate the needs of higher education students. Without a doubt, higher education has evolved and so too should methods employed to address enrollment management issues.
Chapter 3

Methods

The purposes of this dissertation were (a) to assess the period of latency between application and enrollment and (b) to determine whether students would be more likely to persist through the recruitment funnel if institutions altered their enrollment calendars. This chapter presents the research design and includes the following sections: (a) background of the study; (b) research questions; (c) research design; (d) sample, population, and variables; (e) data collection and filtering; (f) data analysis; (g) assumptions; (h) limitations; and (i) conclusion.

Background of the Study

The multi-campus proprietary institution referred to in this study is referred to as “Career College” to preserve confidentiality. Career College is a regionally accredited institution comprised of 12 campuses throughout the United States, including one online campus. Demographically, the makeup of the student body varies by location; however, in totality, Career College represents a full spectrum of student types (e.g., traditional students, non-traditional students, etc.). The enrollment of Career College consists of approximately 6,000 students divided equally between full-time students and part-time students. Non-traditional students, 25 years of age and older, account for 66% of the total student body, while traditional students, 18-24 years of age, account for the remaining 34% of the student body. Career College is regionally accredited by the Higher Learning Commission and is a member of the North Central Association, a fully approved accrediting body of the U.S. Department of Education. Application and acceptance to the university often occur within a 72-hour time frame. The standard academic year at Career
College is comprised of three 16-week semesters (4 months each), labeled as “fall,” “spring,” and “summer.” Within a standard semester, two 8-week terms are offered (labeled as “Term A” and “Term B”). Enrollment (attendance) opportunities for applicants currently occur six times per year. The longest latency period between start dates is 56 days (8 weeks), and the shortest latency period between start dates is 28 days (4 weeks).

Because this study is in some ways a continuation of prior institutional research that was conducted by Career College in 2010, a brief explanation of this prior research is presented here. During the time frame of January 1, 2010, through April 30, 2010, institutional researchers at Career College identified all cases in which students’ recruitment funnel status changed from “applicant” to “enrolled.” Institutional researchers then determined the probability that students would attend classes for the first time during a 6-semester period (i.e., spring 2010 to fall 2011).

While there were differences among campuses, such as programmatic offerings and temporal factors regarding how quickly students moved from applicant to enrolled in the recruitment funnel, Career College found that the latency period between the date of application and the next available start date could reasonably predict the probability of an accepted student actually enrolling. Career College’s institutional researchers found that students who applied, and were accepted, with a latency period of 28 days or fewer between the date of application and the date of enrollment were 50% more likely to enroll than students with a latency period greater than 28 days. Career College research further revealed that students who applied and enrolled within 28 days experienced a yield rate of approximately 75%, while those who applied and enrolled between 29 and 56 days
experienced a 62% enrollment yield rate.

**Research Questions**

This study was guided by the following research questions:

RQ1: Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature six start dates and (b) school years that feature 12 start dates.

H01: Within the recruitment funnel, there is no statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature six start dates and (b) school years that feature 12 start dates.

RQ2: Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) in (a) school years that feature six start dates and (b) school years that feature 12 start dates?

H02: There is no statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) in (a) school years that feature six start dates and (b) school years that feature 12 start dates.

RQ3: Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED)?

H03: Within the recruitment funnel, there is no statistically significant difference in the
mean number of latency days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (student 5 years or greater removed from completion of a high school diploma or GED)?

RQ4: Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or general education diploma (GED) equivalency)?

H04: There is no statistically significant difference in the proportion of students for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED)?

**Research Design**

The research methods for this study reflect a descriptive, quantitative, retrospective, applied research design. According to Houser (2008), retrospective studies “are those that are conducted using data that have already been collected about events that have already happened” (p. 45). Retrospective research designs are often useful because informed consent is not required, information can be gathered easily, and records systems often provide a useful sampling frame. Because one of the primary purposes of this study was to investigate whether there is a statistically significant difference in enrollment yield when colleges implement an increased number of start dates, this study
can be categorized as applied research. Simply put, according to Houser (2007), “Applied research is conducted to gain knowledge that has a practical application” (p. 44).

**Population, Sample, and Variables**

**Population.** The population consisted of student recruitment records between November 1, 2010, and January 31, 2014, at Career College. During this time frame, information was gathered from applicants who entered the recruitment funnel at the institution’s 11 ground-based campuses and one online campus.

**Sample.** The sample consisted of first-time college students, transfer students, traditional students (students less than 5 years removed from completion of a high school diploma or GED), and non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED). The sample included applicants who were unconditionally admitted to the institution. Requirements for these applicants as unconditional admits included the following:

- Completion of an interview process and recommendation by a Career College admissions advisor.
- A completed high school diploma or general education diploma.
- Successful completion of an entrance examination or transfer hour equivalency, predetermined by Career College.
- Completion of an enrollment agreement to remit the enrollment fee, or arrangements to remit the enrollment fee.

The sample included only students who enrolled in programs leading to a diploma, an associate’s degree, or a bachelor’s degree. All students contained in the sample applied to enter into a non-selective academic program (e.g. business, public
safety, design, technology, and some specially designated healthcare programs). Selective academic programs have specific and limited enrollment points of entry, limited enrollment capacity, and admissions criteria that extend beyond the general admissions requirements (e.g., nursing, surgical technology, dental) and were therefore excluded from the data set by Career College. This sample, likewise, included students who sought to attend college on either a full-time or part-time basis.

The sample for RQ1 and RQ3 included applicants who were unconditionally accepted and enrolled (attended). The sample for RQ2 and RQ4 included applicants who were accepted and either (a) enrolled (attended) or (b) did not enroll (attend). In both sample sets, applicants were labeled as either traditional or non-traditional by Career College based on the number of years removed from the completion of a high school diploma or GED.

**Variables.** According to Houser (2008), a variable can be defined as “the measurable aspect of a concept” (p. 169). Put more simply, Field (2013) described variables as “things that can change (or vary); they might vary between people (e.g., IQ, behavior) or location (e.g., unemployment) or even time (e.g., mood, profit, number of cancerous cells)” (p. 7). This study used two independent variables and two dependent variables (see Table 2).

For RQ1, the dependent variable consisted of the mean number of latency days between the date of application and the date of enrollment for students in two categories, or conditions. The two categories represented the independent variables: (a) students entering an academic system comprised of 12 start dates per calendar year and (b) students entering an academic system comprised of 6 start dates per calendar year.
Table 2

*Dependent and Independent Variables*

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Dependent Variables</th>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature six start dates and (b) school years that feature 12 start dates.</td>
<td>Mean number of latency days between the date of application and the date of enrollment for students.</td>
<td>The condition of students entering an academic system comprised of 12 start dates per calendar year.</td>
</tr>
<tr>
<td></td>
<td>RQ2: Is there a statistically significant difference in the proportion of students who successfully complete the enrollment funnel (i.e., actually attend classes) in (a) school years that feature six start dates and (b) school years that feature 12 start dates?</td>
<td>Proportion of students who successfully completed the recruitment funnel (i.e., actually attend classes).</td>
</tr>
<tr>
<td></td>
<td>RQ3: Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment (a) for traditional students (students between the ages of 18 and 24) and (b) non-traditional students (students 25 years of age or older)?</td>
<td>Mean number of latency days between the date of application and the date of enrollment for students</td>
</tr>
<tr>
<td></td>
<td>RQ4: Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) for (a) traditional students (student 4-years or less removed from completion of a high school diploma or GED) and (b) non-traditional students (student 5-years or greater removed from completion of a high school diploma or GED)?</td>
<td>Proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes).</td>
</tr>
</tbody>
</table>
For RQ2, the dependent variables consisted of the proportion of students who successfully completed the recruitment funnel (i.e., actually attended classes). Two categories represented the independent variables: (a) students entering an academic system comprised of 12 start dates per calendar year, and (b) students entering an academic system comprised of 6 start dates per calendar year.

For RQ3, the dependent variable consisted of the mean number of latency days between the date of application and the date of enrollment for students in two categories, or conditions. The two categories represented the independent variables: (a) students less than 5 years removed from completing a high school diploma or GED (traditional students) and (b) students less than 5 years removed from completing a high school diploma or GED (non-traditional students). The respective categories into which they fell (i.e., traditional or non-traditional), were determined based on the number of years removed from completion of a high school diploma or GED.

For RQ4, the dependent variables consisted of the proportion of students who successfully completed the recruitment funnel (i.e., actually attended classes). Two categories represented the independent variables: (a) students less than 5 years removed from completing a high school diploma or GED (traditional students), and (b) students 5 years or greater removed from completing a high school diploma or GED (non-traditional students)

**Data Collection and Filtering**

Because this was a retrospective study, the data already were collected, scrubbed, and filtered by Career College prior to delivery to the researcher. The data that were collected included recruitment information about prospective students, including a
personally non-identifiable, system-generated student number; application date (only unconditionally admitted students were included); start date; start (yes or no); and high school or GED completion year. Student data were coded as traditional or non-traditional status (determined by years removed from high school or GED completion year) (see Table 3). Because this was a retrospective study and the data already had been collected, no human subjects were exposed to any procedures. No personally identifiable information was supplied by Career College. Student records were provided from Career College with a computer-generated system identification number assigned that could not be linked back to an individual student record without secure and direct access from authorized representatives of Career College.

Table 3

*Example of Hypothetical Data Collected*

<table>
<thead>
<tr>
<th>Student</th>
<th>DOB</th>
<th>Accepted</th>
<th>Cancelled</th>
<th>Enrolled</th>
<th>No. of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>01/01/1980</td>
<td>12/15/10</td>
<td></td>
<td>03/21/11</td>
<td>77</td>
</tr>
<tr>
<td>Student 2</td>
<td>01/01/1970</td>
<td>10/01/10</td>
<td>11/15/10</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Student 3</td>
<td>01/01/1990</td>
<td>11/15/10</td>
<td></td>
<td>01/04/11</td>
<td>50</td>
</tr>
<tr>
<td>Student 4</td>
<td>01/01/1985</td>
<td>10/15/10</td>
<td></td>
<td>01/31/11</td>
<td>108</td>
</tr>
</tbody>
</table>

The procedures for filtering the data consisted of removing all unnecessary information from the student records (i.e., fields that would be relevant only to Career College’s internal processing). To identify and isolate homogeneous student records within the data set, the researcher filtered the data to eliminate (a) high school students taking college level classes, (b) students who already graduated with a post-secondary degree and were returning to complete an advanced degree, and (c) and students entering
Several reasons provided the impetus for filtering the data in this way. First, high school students must graduate from high school before they are admitted to attend post-secondary institutions and therefore have the potential to skew latency data if their date of application is very early on in the recruitment process (i.e., while they are still in high school). Secondly, students who enter the recruitment funnel already in possession of a post-secondary degree (e.g., students returning to college after having earned an associate’s degree) have prior existing knowledge of the college enrollment process and may therefore flow through the recruitment funnel without hesitation or obstacles, thereby skewing latency and yield rates among first-time college students. Finally, students who are pursuing enrollment into selective academic programs were filtered out of the data set because these academic programs already operate under less frequent (i.e., non-standard) start dates, and these students compete for entry into these programs. Because of these non-standard start dates and increased competition for entry into select programs, including these student records likely would have skewed latency and yield rates among first-time college students and transfer students; therefore, they also were excluded.

**Data Analysis**

In every research effort that involves quantitative data, it is especially important that the methods of data analysis align with the research questions and the type of data collected. According to Field (2013), an independent samples t-test is used “when there are two experimental conditions and different participants were assigned to each condition” (p. 364). Therefore, because participants in this study were assigned to one of
two conditions (i.e., categories) to answer each research question (i.e., 6 start dates/12 start dates and traditional/non-traditional), *t*-tests were the most appropriate method of statistical analyses to use for this study.

A *t*-test allows researchers to determine whether a statistically significant difference exists between two variables. According to the null hypothesis, the researcher predicted that the outcome of the *t*-test would reveal that no statistically significant differences existed between the variables (*alpha* = .05). To reject the null hypothesis, a *p*-value, of less than .05 would need to be obtained in the results. The *p*-value is the probability that the observed statistic occurred by chance alone (Field, 2013). To determine whether the observed outcome was statistically significant, the researcher compared the values of the *alpha* level and the *p*-value. When these two values are compared, one of two possible outcomes occurs:

- The *p*-value is less than or equal to the *alpha* level. In this case, the researcher rejects the null hypothesis, and the results are statistically significant. The testing reveals with reasonable surety that the observed results can be explained by an influence or relationship not attributable to chance.
- The *p*-value is greater than *alpha* level. In this case, the researcher fails to reject the null hypothesis, and the results are not statistically significant. The testing would reveal with reasonable surety that the observed results can be explained by chance.

The smaller the *alpha* value, the more difficult it is to claim that the results are statically significant. On the other hand, the larger the *alpha* value, the easier it is to claim that the results are statistically significant.
Assumptions

Every research project takes place within certain environmental contexts, and therefore it is necessary to make assumptions about those contexts. According to Lunenburg and Irby (2008), “Assumptions are postulates, premises, and propositions that are accepted as operational for the purposes of the research” (p. 135). In this research study, the researcher assumed that the enrollment counselors, administrators, and institutional researchers accurately reported enrollment data at the time it was collected. The researcher also assumed that all participants were honest in reporting enrollment data during the period from November 1, 2010, through January 31, 2014.

To ensure that t-tests were the most appropriate method of statistical analysis, for RQ1, RQ2, and RQ3, to use in this study, the researcher checked that the following requirements (assumptions) regarding the data were met:

- The dependent variables were continuous.
- Observations of the dependent variable were independent of each other.
- The data were measured on an interval or ratio scale.
- The data were normally distributed.

First, the dependent variables were continuous in that they consisted of (a) the number of days between application and enrollment and (b) the ratio of students who completed the recruitment funnel (both continuous variables). Secondly, because participants in this study were assigned to one of two conditions (i.e., categories) to answer each research question (i.e., 6 start dates/12 start dates and traditional/non-traditional), the samples were considered independent. Third, because they both contain a true zero point and can be expressed as ratios, both the number of days between
application and enrollment as well as the ratio of students who completed the recruitment funnel were considered variables on a ratio scale. Fourth, the data were examined to determine whether they reflected a normal distribution. When the assumption of normality was violated, the researcher (a) used a Mann-Whitney U test, which is a non-parametric equivalent of the t-test, or (b) extracted a random sample from the data set. According to Morgan, Leech, Gloeckner, and Barrett (2013), “The Mann-Whitney test is only slightly less powerful than the t-test, so it is a good alternative if the assumptions of the t-test are violated” (p. 149).

For RQ4, a chi-square test of association was used to determine whether statistically significant differences existed in the proportion of students who completed the enrollment funnel in years featuring 6 start dates and years featuring 12 start dates. Likewise, a chi-square test of association was used to determine whether statistically significant differences existed in the proportion of traditional students who completed the enrollment funnel and the proportion of non-traditional students who completed the enrollment funnel.

**Limitations**

Every research study is bound by limitations of scope, application, and practice. Lunenburg and Irby (2008) have suggested that “limitations are factors that may have an effect on the interpretation of the findings or on the generalizability of the results. Limitations may arise from the methodology, data, or method of analysis” (p. 133). This study was limited in the following three ways:

- The data set was retrieved from one university with multiple campuses, so the results of analyses based on this data set may not be representative of other
universities.

- Enrollment data were collected at different times under different circumstances by different individuals in different academic contexts. This may have resulted in minor inaccuracies in the data collection process.

- Any potential significance between the two groups (e.g., 6 start dates/12 start dates, traditional/non-traditional) may not be attributable to the independent variables because of the influence of other intervening variables.

**Conclusion**

The higher-education marketplace in the United States has been evolving during the past several decades. Competition has increased, and modes of instructional delivery have changed to meet demand, yet enrollment at post-secondary institutions in the United States has been declining. Students have not persisted through the pre-matriculation funneling stages of the enrollment process with the same consistency as they have in the past. If changes and new approaches to the traditional enrollment process are not explored, declines in enrollment are likely to continue, causing adverse impact to some institutions. One potential new approach that this study sought to investigate is that of moving from an academic calendar with 6 start dates per calendar year to an academic calendar with 12 start dates per calendar year as a way of decreasing latency periods in the enrollment funnel and increasing retention.
Chapter 4

Results

This chapter presents the results of the various statistical analyses that were conducted to explore the influence of latency on enrollment yield within the recruitment funnel. Until students reach the “enrolled” stage of the recruitment funnel (i.e., actually attend classes), colleges and universities spend valuable operational dollars recruiting students--dollars that offer no guarantee of producing a return on investment. In fact, recruitment dollars that do not result in enrollment yield often create significant, and possibly debilitating, sunk costs. The ability of institutions to increase the number of students who persist through the recruitment funnel and actually enroll presents an opportunity to influence enrollment decline.

In order to slow and even reverse declines in student enrollment, researchers have identified a number of factors that influence student persistence, retention, and attrition after enrollment has occurred (see Astin, 1975; Bean & Metzner, 1985; Pascarella, 1980; Spady, 1970; Tinto, 1975). However, the topic of latency (i.e., time between application and enrollment) has been neglected—largely because it has been considered a pre-matriculation factor contained within the recruitment funnel and outside of the traditional agrarian enrollment calendar. Persistence through the stages of the recruitment funnel drives enrollment yield, which in turn drives enrollment. Colleges and universities have suffered enrollment declines, budget cuts, and austerity measures, yet few have attempted to alter the latency period within the recruitment funnel.

A longer latency period between application and attendance in classes raises the probability that applicants will experience opportunities that can cause them to change
their mind about attending classes (i.e., the decision to attend classes is no longer optimal given the arrival of new opportunities). Thus, new opportunities that arise during the latency period can lead to time inconsistency. The purpose of this study was to determine whether shortening the latency period between application and enrollment increases the likelihood that students will attend classes and whether the likelihood of attending classes depends on the classification (i.e., traditional or non-traditional) of prospective students.

For example, at traditional colleges and universities, where most students attend directly when they graduate from high school, the likelihood of their attending classes has not been viewed as dependent on latency conditions. However, nontraditional students are more likely than non-traditional students to encounter alternative opportunities during the latency period and therefore may be more responsive to the length of the latency period.

**Purpose Statement**

The purposes of this dissertation were (a) to assess the period of latency between application and enrollment and (b) to determine whether students would be more likely to persist through the recruitment funnel if institutions altered their enrollment calendars.

**Research Questions**

The following research questions guided this study:

*Research Question 1:* Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature six start dates and (b) school years that feature 12 start dates?

*Research Question 2:* Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually
attend classes) in (a) school years that feature six start dates and (b) school years that feature 12 start dates?

Research Question 3: Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED)?

Research Question 4: Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED)?

Summary of the Participants, Data Collection Techniques, and Data Analysis Techniques

Summary of Participants

The researcher identified Career College as an institution that increased the number of start dates per year within its recruitment funnel from 6 start dates to 12 start dates. The institution agreed to participate in the study, allowing the researcher to analyze its enrollment data. The data used for this retrospective descriptive study were a subset of Career College’s total records base. Enrollment information about all individuals in Career College’s recruitment and records system between November 1, 2010, and January 31, 2014 comprised the data set. The initial enrollment data collected by Career College (not provided to the researcher) included more than 60,000 files with information
about prospects, inquiries, non-degree seekers, selective and non-selective program seekers, true high school students, and graduate students. Information about some groups of applicants not relevant to the research questions in this study was also collected. For example, the initial enrollment data collected by Career College included inquiries (prospective students who indicated interest in learning more about the institution but never applied), non-degree-seeking inquiries (students pursuing a single course), true high school students enrolled in a post-secondary options program (high school students seeking college credit as high school students), students who showed interest in academic programs that were not offered at regular intervals or academic programs that featured a selective/competitive enrollment process, and professional-level (graduate) programs of study. In collaboration with the researcher and in light of the proposed research questions, Career College officials, as authorized by the Office of Institutional Research (IR), removed the aforementioned files prior to the resulting data being delivered to the researcher. The authorized employee of Career College had 10 years of experience at the institution; served as national director of admissions, with all-inclusive familiarity of academic programs at all 12 campuses; and possessed a complete understanding of all data and variable fields within Career College’s records system. Furthermore, the Career College representative discussed with the researcher various aspects of the data to ensure that the data delivered were appropriate for answering the research questions. Career College then removed all ancillary and non-usable information (data relevant only to employees of Career College, such as city, state, zip) from the data set before delivering it to the researcher. The final data set delivered to the researcher included only information that met the following criteria:
Participants must have been admitted to Career College unconditionally.

The time between the application date and the start date must not have exceeded 365 days.

All participants must have been undergraduate students pursuing a certificate, diploma, associate’s degree, or bachelor’s degree.

Students must be a minimum age of 18.

Students must have been enrolled into non-selective academic programs with ongoing enrollment opportunities as defined by Career College.

All participants must have indicated a high school graduation date or General Equivalency Diploma (GED) completion date.

After the inclusion criteria were applied to the data set, data from 32,695 participants were provided to the researcher and analyzed in order to answer the research questions.

**Summary of Data Collection Techniques**

The initial data for this study were collected by researchers in the Office of Institutional Research at Career College. Using Career College’s recruitment and records system, these researchers extracted all student records within the inclusion parameters. The data were then further filtered, as directed and authorized by the Office of Institutional Research at Career College. The collection and scrubbing of the data were performed and reviewed by personnel who possessed the expertise and historical perspective necessary to provide a stable data set for analysis, as described above. The variables that were collected included recruitment information about prospective students, including a non-identifiable system-generated student number; application date (only unconditionally admitted students were included); start date; start status (i.e., yes or
no); and year that high school or GED was completed.

**Summary of Data Analysis Techniques**

The researcher coded students as either traditional or non-traditional. The coding classification was determined by calculating the number of years following high school or GED completion. Students with a completion date equal to or greater than 5 years removed from high school or GED completion were coded and classified as “non-traditional students.” Students with a completion date less than 5 years removed from high school or GED completion were coded and classified as “traditional students.” The researcher further used the data to calculate the latency period between application date and start date.

The method used to analyze the data set consisted of several steps. First, an exploratory data analysis (EDA) was conducted to identify any potential problems with the data set. The EDA was used to evaluate the normality, skewness, and kurtosis of the data. Levene test statistics were also calculated to determine whether statistically significant differences existed in the homogeneity of variance between groups (e.g., traditional students, non-traditional students, students entering the recruitment funnel in years featuring 6 start dates, and students entering the recruitment funnel in years featuring 12 start dates).

After the EDA was conducted, descriptive statistical analyses were conducted using t-tests and chi-square analyses. T-tests were conducted to determine whether statistically significant differences in latency and enrollment yield existed between students entering the recruitment funnel under a 6-start-per-year system and students entering the recruitment funnel under a 12-start-per-year system. More specifically, these
$t$-tests were conducted to determine whether a 6-start system or a 12-start system (a) reduced the number of days students spent in the recruitment funnel and (b) produced a higher yield rate among traditional or non-traditional students.

In addition to $t$-tests, chi-square analyses were conducted to determine whether statistically significant differences existed between (a) the proportion of students who successfully completed the recruitment funnel (i.e., actually attended classes) under a 6-start-per-year system and (b) the proportion of students who successfully completed the recruitment funnel (i.e., actually attended classes) under a 12-start-per-year system. Effect sizes (Pearson’s $r$, Cohen’s $d$, Cramer’s $V$, and Cramer’s $\phi$) also were conducted for each analysis.

**Results of the Data Analysis**

**Exploratory Data Analysis (EDA)**

According to Leech, Barrett, and Morgan (2011), “Exploratory data analysis (EDA) is a method of examining data . . . to see if there are inconsistencies, double coding, obvious errors, etc.” (p. 28). Leech et al. have noted that “many times there are errors or problems with the data that need to be located and either fixed, or at least noted” (p. 28). In order to identify any potential problems with the data (e.g., non-normal distributions, missing values, input errors), the researcher conducted two sets of EDAs. The first EDA was conducted by dividing the data into two groups--(a) those participants who entered the recruitment funnel under the 6-start-per-year system and (b) those participants who entered the recruitment funnel under the 12-start-per-year system (see Table 4).
Table 4

*EDA Results for Participants in 6- and 12-Start Systems*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>6-Start System</th>
<th>12-Start System</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Participants</td>
<td>27,084</td>
<td>5,611</td>
</tr>
<tr>
<td>Mean</td>
<td>29.98</td>
<td>28.91</td>
</tr>
<tr>
<td>Median</td>
<td>20.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Variance</td>
<td>1353.89</td>
<td>1176.29</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>36.80</td>
<td>34.30</td>
</tr>
<tr>
<td>Skewness</td>
<td>4.01</td>
<td>4.46</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>22.25</td>
<td>28.56</td>
</tr>
</tbody>
</table>

A test for homogeneity of variance (Levene statistic) was conducted to determine whether the variances between these groups were equal. The results indicated (a) that the variances were unequal, $F(1, 3,2693) = 23.59$, $p = .000$, and (b) that the assumption of homogeneity was violated. In addition, the skewness exceeded the $+1/-1$ threshold (4.01, 4.46), and the kurtosis values were higher than 3 (22.25, 28.56), which also indicated that the data were not normally distributed. When data violate the assumptions of normality and other conditions, this can influence the results of the data analysis. According to Leech et al., “Both the t test and ANOVA may be affected if the variances of the groups to be compared are substantially different, especially if the number of participants in each group differs markedly” (p. 29). However, additional analyses can be conducted to compensate for the fact that a data set violates assumptions of normality (i.e., conduct an analysis using a non-parametric statistic, such as the Mann-Whitney U test).

The second EDA was conducted by dividing the data into two groups--(a) those
participants who were identified as “traditional” students and (b) those participants who were identified as “nontraditional” students (see Table 5).

Table 5

*EDA Results for Traditional and Nontraditional Students*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Traditional</th>
<th>Nontraditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Participants</td>
<td>25,127</td>
<td>7,568</td>
</tr>
<tr>
<td>Mean</td>
<td>37.77</td>
<td>27.39</td>
</tr>
<tr>
<td>Median</td>
<td>21.00</td>
<td>19.00</td>
</tr>
<tr>
<td>Variance</td>
<td>2768.71</td>
<td>863.49</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>52.62</td>
<td>29.384</td>
</tr>
<tr>
<td>Skewness</td>
<td>3.37</td>
<td>3.70</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>12.80</td>
<td>22.52</td>
</tr>
</tbody>
</table>

A test for homogeneity of variance (Levene statistic) was conducted to determine whether the variances between these groups were equal. The results indicated (a) that the variances were unequal, $F(1, 3,2693) = 1088.48, p = .000$, and (b) that the assumption of homogeneity was violated. In addition, the skewness exceeded the $+1/-1$ threshold (3.37, 3.70), and the kurtosis values were higher than 3 (12.80, 22.52), which also indicated that the data were not normally distributed.

Statistics showing the most frequent high school graduation years were calculated from the data used to answer RQ1 and RQ3 (see Figure 2), as well as the data used to answer RQ2 and RQ4 (see Figure 3). For the data used to answer RQ1 and RQ3, a frequency analysis indicated that the median year participants graduated from high school was 2000, and the mode was 2005. One quarter (25%) of the participants graduated in
1993 or before, half (50%) graduated in 2005 or before, and three-quarters (75%) graduated in 2006 or before (see Figure 2).

Figure 2. Year of high school graduation from data used to answer RQ1 and RQ3.

For the data used to answer RQ2 and RQ4, a frequency analysis indicated that the median year participants graduated from high school was 2001, and the mode was 2008. One quarter (25%) of the participants graduated in 1994 or before, half (50%) graduated in 2001 or before, and three-quarters (75%) graduated in 2007 or before (see Figure 3).
Research Question 1

Within the recruitment funnel, is there a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature 6 start dates and (b) school years that feature 12 start dates? In order to determine whether a statistically significant difference existed between these two groups, the researcher conducted a $t$-test (equal variances not assumed). The results indicated that a statistically significant difference existed between these two groups, $t(1, 32,693) = 2.11, p = .035, d = .030$. This result suggests that there was a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature 6 start dates ($M = 29.98$) and (b) school years that feature 12 start dates ($M = 28.91$).
Because the data were not normally distributed in both the 6-start-date group and the 12-start-date group, the researcher conducted a power analysis using GPower. The rationale for using a sample of the population was to mitigate the effects of non-normality of the data set and any other potential errors that might have been introduced in the coding/filtering process. Using a power analysis helped to ensure optimal results by identifying an appropriate sample size based on preferred parameters. The GPower (a priori) analysis was conducted using the following parameters:

- Effect size: 0.2
- Tails: 2
- Alpha: .05
- Power: .95
- Sample size: 1,032

After two random samples from the data were selected (one from the 6-start-date group and one from the 12-start-date group), a Levene test for equality of variances indicated that the variances between these two groups were approximately equal — $F(1, 1,517) = .794, p = .373$. However, the results of the independent samples $t$-test (equal variances assumed) indicated that no statistically significant difference existed between these two groups, $t(1, 1,517) = .153, p = .878$. This result suggests that there was no statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature 6 start dates ($M = 30.16$) and (b) school years that feature 12 start dates ($M = 29.86$).

Because the results of the initial $t$-test (using the entire data set) differed from the result of the second $t$-test (using Sample 1), a third $t$-test was conducted using a different
randomly selected sample from both data sets. A Levene test for equality of variances indicated that the variances between these two groups were not equal — $F(1, 1,449) = 6.732, p = .010$. The results of the third $t$-test (equal variances not assumed) indicated again that no statistically significant difference existed between these two groups, $t(1, 1,499) = .853, p = .394$. This result suggests that there was no statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature 6 start dates ($M = 29.67$) and (b) school years that feature 12 start dates ($M = 28.10$).

When interpreted together, the results of the first $t$-test using the entire population ($p=.035$), the second $t$-test using Sample 1 ($p=.878$), and the third $t$-test using Sample 2 ($p=.394$) were inconclusive. Therefore, it cannot be concluded with certainty that there was a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that feature 6 start dates and (b) school years that feature 12 start dates.

To further explore the influence of transitioning from a 6-start-date calendar to a 12-start-date calendar on traditional and non-traditional students, two additional analyses were conducted. The first analysis was conducted using an independent samples $t$-test to compare the mean number of latency days between application and enrollment of traditional students in the 6-start-date group to the mean number of latency days between application and enrollment of traditional students in the 12-start-date group. A Levene test for equality of variances indicated that the variances between these two groups were not equal — $F(1, 1,517) = 19.317, p = .000$. The results of the independent samples $t$-test (equal variances not assumed) indicated that a statistically significant difference existed
between these two groups, \( t(1, 1,795) = 3.288, p = .001, d = .010 \). This result suggests that there was a statistically significant difference in the mean number of latency days between application and enrollment of traditional students in the 6-start-date group \( (M = 38.56) \) to the mean number of latency days between application and enrollment of traditional students in the 12-start-date group \( (M = 33.51) \).

The second analysis was conducted using an independent samples \( t \)-test to compare the mean number of latency days between application and enrollment of non-traditional students in the 6-start-date group to the mean number of latency days between application and enrollment of non-traditional students in the 12-start-date group. A Levene test for equality of variances indicated that the variances between these two groups were approximately equal — \( F(1, 25,125) = 2.516, p = .113 \). The results of the independent samples \( t \)-test (equal variances assumed) indicated that no statistically significant difference existed between these two groups, \( t(1, 25,125) = -.699, p = .504 \). This result suggests that there was not a statistically significant difference in the mean number of latency days between application and enrollment of non-traditional students in the 6-start-date group \( (M = 27.34) \) to the mean number of days between application and enrollment of traditional students in the 12-start-date group \( (M = 27.66) \).

**Research Question 2**

Is there a statistically significant difference in the proportion of students who successfully complete the recruitment funnel (i.e., actually attend classes) in (a) school years that feature 6 start dates and (b) school years that feature 12 start dates? In order to determine whether a statistically significant difference existed between these two groups, a chi-square test of association was conducted. Table 6 shows the Pearson chi-square
results and indicates that there was no statistically significant difference between (a) the proportion of students who completed the enrollment funnel in years that featured 6 start dates and (b) the proportion of students who completed the recruitment funnel in years that featured 12 start dates.

Table 6

Chi-Square Results--Proportion of All Students Completing the Recruitment Funnel in School Years Featuring 6 Start Dates and 12 Start Dates

<table>
<thead>
<tr>
<th>Applicant Started Classes</th>
<th>No. of Starts</th>
<th>Yes</th>
<th>No</th>
<th>Totals</th>
<th>$X^2$</th>
<th>$p$</th>
<th>$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Start</td>
<td></td>
<td>17,320 (68.3%)</td>
<td>8,029 (31.7%)</td>
<td>25,349</td>
<td>0.172</td>
<td>.678</td>
<td>.002</td>
</tr>
<tr>
<td>12-Start</td>
<td></td>
<td>4,389 (68.0%)</td>
<td>2,060 (32.0%)</td>
<td>6,449</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>21,709 (100.0%)</td>
<td>10,089 (100.0%)</td>
<td>31,798</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Research Question 3

Within the recruitment funnel, is there a statistically significant difference in the mean number of days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED)? In order to determine whether a statistically significant difference existed between these two groups, the researcher conducted a $t$-test (equal variance not assumed). The results indicated that a statistically significant difference existed between these two groups, $t(1, 9,031) = -16.40$, $p = .000$, $d = .29$. This suggests that there was a statistically significant difference
in the mean number of latency days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) \( (M = 37.77) \) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED) \( (M = 29.38) \).

Because the data were not normally distributed in both the traditional group and the non-traditional group, the researcher conducted a power analysis using GPower. The rationale for using a sample of the population was to mitigate the effects of non-normality of the data set and any other potential errors that might have been introduced in the coding/filtering process. The GPower \((a \ priori)\) analysis was conducted using the following parameters:

- Effect size: 0.2
- Tails: 2
- Alpha: .05
- Power: .95
- Sample size: 1,032

After two random samples from the data were selected (one from the traditional group and one from the non-traditional group), a Levene test for equality of variances indicated that the variances between these two groups were not equal--\( F(1, 1,517) = 64.202, p = .000 \). The results of the independent samples \( t \)-test (equal variances not assumed) indicated that a statistically significant difference existed between these two groups, \( t(1, 393) = 3.303, p = .001 \). This result suggests that there was a statistically significant difference in the mean number of latency days between the date of application
and the date of enrollment for traditional students ($M = 38.19$) and non-traditional students ($M = 27.66$).

A third independent samples $t$-test was conducted using a different randomly selected sample from both data sets (i.e., traditional students and non-traditional students). The rationale for using a sample of the population was to mitigate the effects of non-normality of the data set and any other potential errors that might have been introduced in the coding/filtering process. A Levene test for equality of variances indicated that the variances between these two groups were not equal — $F(1, 1,449) = 65.203$, $p = .000$. The results of the third $t$-test indicated that a statistically significant difference existed between these two groups, $t(1, 1,499) = -3.678$, $p = .000$. This result suggests that there was a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for traditional students ($M = 38.06$) and non-traditional students ($M = 26.40$).

When interpreted together, the results of the first $t$-test using the entire population ($p = .000$), the second $t$-test using Sample 1 ($p = .001$), and the third $t$-test using Sample 2 ($p = .000$) were conclusive. Therefore, the null hypothesis can be rejected, and it can be concluded that there was a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for traditional students and non-traditional students.

To further explore the difference in the mean number of latency days between application and enrollment among traditional and non-traditional students, two additional analyses were conducted. The first analysis was conducted using an independent samples $t$-test to compare the mean number of latency days between the date of application and
the date of enrollment of traditional students and non-traditional students within the 6-start-date group. A Levene test for equality of variances indicated that the variances between these two groups were not equal — $F(1, 1,517) = 1019.551, p = .000$. The results of the independent samples $t$-test (equal variances not assumed) indicated that a statistically significant difference existed between these two groups, $t(1, 1,795) = 21.487, p = .000, d = .026$. This result suggests that there was a statistically significant difference in the mean number of latency days between application and enrollment of traditional students ($M = 38.56$) and non-traditional students ($M = 27.34$) in the 6-start-date group.

The second analysis was conducted using an independent samples $t$-test to compare the mean number of latency days between application and enrollment of traditional students and non-traditional students within the 12-start-date group. A Levene test for equality of variances indicated that the variances between these two groups were not equal — $F(1, 25,125) = 5,609, p = .000$. The results of the independent samples $t$-test (equal variances not assumed) indicated that a statistically significant difference existed between these two groups, $t(1, 1,444) = .4.025, p = .000$. This result suggests that there was a statistically significant difference in the mean number of days between application and enrollment of traditional students ($M = 47.77$) and non-traditional students ($M = 29.51$) within the 12-start-date group.

**Research Question 4**

Is there a statistically significant difference in the proportion of traditional students and nontraditional students who successfully complete the recruitment funnel (i.e., actually attend classes) in (a) school years that feature 6 start dates and (b) school years that feature 12 start dates? In order to determine whether a statistically significant
difference existed between these two groups, a chi-square test of association was conducted. Table 7 shows the Pearson chi-square results and indicates that there was a statistically significant difference ($p = .000$, $\phi = .074$) in the proportion of traditional students and non-traditional students who completed the enrollment funnel.

Table 7

Chi-Square Results--Proportion of Traditional and Non-Traditional Students Completing the Recruitment Funnel in School Years Featuring 6 Start Dates and 12 Start Dates Combined

<table>
<thead>
<tr>
<th>Applicant Started Class</th>
<th>Traditional</th>
<th>Non-Traditional</th>
<th>Totals</th>
<th>$X^2$</th>
<th>$p$</th>
<th>$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5,565 (62.7%)</td>
<td>16,144 (70.4%)</td>
<td>21,709</td>
<td>173.80</td>
<td>.000</td>
<td>.074</td>
</tr>
<tr>
<td>No</td>
<td>3,305 (37.3%)</td>
<td>6,784 (29.6%)</td>
<td>10,089</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>8,870 (100.0%)</td>
<td>22,928 (100.0%)</td>
<td>31,798</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Three additional chi-square analyses were conducted focusing on differences between the proportion of traditional students who successfully completed the recruitment funnel and the proportion of non-traditional students who successfully completed the recruitment funnel. The first chi-square analysis was conducted using data from students who completed the enrollment funnel in school years that featured 6 start dates. In order to determine whether a statistically significant difference existed between these two groups in school years that featured 6 start dates, a chi-square test of association was conducted. Table 8 shows the Pearson chi-square results and indicates
that there was a statistically significant difference \( (p = .000, \phi = -.083) \) in the proportion of traditional students and non-traditional students who completed the enrollment funnel in school years that featured 6 start dates.

Table 8

Chi-Square Results—Proportion of Traditional and Non-Traditional Students Completing the Recruitment Funnel in School Years Featuring 6 Start Dates

<table>
<thead>
<tr>
<th>Applicant Started Class</th>
<th>Traditional</th>
<th>Non-Traditional</th>
<th>Totals</th>
<th>( X^2 )</th>
<th>( p )</th>
<th>( \phi )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4,518 (62.2%)</td>
<td>12,802 (70.7%)</td>
<td>17,320</td>
<td>175.68</td>
<td>.000</td>
<td>.083</td>
</tr>
<tr>
<td>No</td>
<td>2,744 (37.8%)</td>
<td>5,285 (29.3%)</td>
<td>8,029</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>7,262 (100.0%)</td>
<td>18,087 (100.0%)</td>
<td>25,349</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The second chi-square analysis was conducted using data from students who completed the enrollment funnel in school years that feature 12 start dates. In order to determine whether a statistically significant difference existed between these two groups in school years that feature 12 start dates, a chi-square test of association was conducted. Table 9 shows the Pearson chi-square results and indicates that there was a statistically significant difference \( (p = .003, \phi = -.036) \) in the proportion of traditional students and non-traditional students who completed the enrollment funnel in school years that feature 12 start dates.
Table 9

Chi-Square Results--Proportion of Traditional and Non-Traditional Students Completing the Recruitment Funnel in School Years Featuring 12 Start Dates

<table>
<thead>
<tr>
<th>Applicant Started Class</th>
<th>Traditional</th>
<th>Non-Traditional</th>
<th>Totals</th>
<th>$X^2$</th>
<th>$p$</th>
<th>$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1,047 (65.1%)</td>
<td>3,342 (69.0%)</td>
<td>4,389</td>
<td>8.55</td>
<td>.003</td>
<td>-.036</td>
</tr>
<tr>
<td>No</td>
<td>561 (34.9%)</td>
<td>1,499 (30.9%)</td>
<td>2,060</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>1,608 (100.0%)</td>
<td>4,841 (100.0%)</td>
<td>6,449</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third chi-square analysis was conducted using data from traditional and non-traditional students who completed the enrollment funnel in school years that featured both 6 start dates and 12 start dates. More specifically, this analysis was conducted to determine whether a statistically significant difference existed between traditional and non-traditional students in either the 6-start-date group or 12-start-date group. Table 10 shows the Pearson chi-square results and indicates that there was a statistically significant difference ($p = .003$) in the proportion of traditional students and non-traditional students who completed the enrollment funnel in school years that featured 6 start dates and school years that featured 12 start dates.
Table 10

*Chi-Square Results--Proportion of Traditional Students and Non-Traditional Students Completing the Recruitment Funnel in School Years Featuring 6 Start Dates and School Years Featuring 12 Start Dates.*

<table>
<thead>
<tr>
<th>No. of Starts</th>
<th>Student Classification (6 and 12 Start Dates)</th>
<th>Totals</th>
<th>$X^2$</th>
<th>$p$</th>
<th>$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional</td>
<td>Non-Traditional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Start</td>
<td>4,518 (26.1%)</td>
<td>12,802 (73.9%)</td>
<td>17,320</td>
<td>9.137</td>
<td>.003</td>
</tr>
<tr>
<td>12-Start</td>
<td>1,047 (23.9%)</td>
<td>3,342 (76.1%)</td>
<td>4,389</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>5,565 (100.0%)</td>
<td>16,144 (100.0%)</td>
<td>21,709</td>
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</tr>
</tbody>
</table>

**Summary**

The results of this study indicated that there is a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for students in (a) school years that featured six start dates and (b) school years that featured 12 start dates. The period of latency between application date and start date was slightly reduced (1.07 days) when Career College moved from a 6-start-per-year calendar to a 12-start-per-year calendar.

There was no statistically significant difference between (a) the proportion of students who completed the enrollment funnel in years that featured 6 start dates and (b) the proportion of students who completed the recruitment funnel in years that featured 12 start dates. This suggests that moving from a 6-start-per-year calendar to a 12-start-per-year calendar had little influence on the number/proportion of students who completed
the recruitment funnel under each calendar.

There was a statistically significant difference in the mean number of latency days between the date of application and the date of enrollment for (a) traditional students (students less than 5 years removed from completion of a high school diploma or GED) and (b) non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED) (8.39 days). Additionally, there was a statistically significant difference ($p = .000, \phi = .074$) in the proportion of traditional students and non-traditional students who completed the enrollment funnel. Not only were non-traditional students able to complete the recruitment funnel in substantially less time than traditional students, but also a greater number/proportion of non-traditional students completed the recruitment funnel than traditional students. Furthermore, there was a statistically significant difference ($p = .000, \phi = -.083$) in the proportion of traditional students and non-traditional students who completed the enrollment funnel in school years that featured 6 start dates. Finally, there was a statistically significant difference ($p = .003, \phi = -.036$) in the proportion of traditional students and non-traditional students who completed the enrollment funnel in school years that featured 12 start dates. A greater number/proportion of non-traditional students completed the recruitment funnel than traditional students within both the 6-start-per-year calendar as well as the 12-start-per-year calendar.

Chapter 5 includes an introduction, summary of the results, and discussion section. It also includes recommendations for practice, conclusions and recommendations for future research, and limitations.
Chapter 5

Discussion

The purposes of this dissertation were (a) to assess the period of latency between application and enrollment and (b) to determine whether students would be more likely to persist through the recruitment funnel if institutions altered their enrollment calendars. This chapter presents an executive summary, the research questions, a summary of the results, a discussion of the results in light of theory and prior research, recommendations for practice, conclusions and recommendations for future research, limitations of the study, and a conclusion.

Summary

The United States has experienced a trend of increasing numbers of students applying to attend college, yet fewer students actually have been enrolling (National Student Clearinghouse Research Center, 2012). Colleges and universities have depended upon enrollment as a means of financial solvency, future growth, and operational stability. Without successful recruitment, institutions are faced with budget cuts, austerity measures, sunk costs, reductions in student services, and an overall economic depreciation of the otherwise positive value provided through the product of education. As an investment product, colleges and universities have continued to spend millions of dollars recruiting students and persuading them to invest in the product of education. However, when students fail to persist through the recruitment funnel, colleges and universities have been faced with financial challenges and forced to explore strategies to alter outcomes.

This research was a study of one multi-campus institution's attempt to influence
enrollment yield by altering an institutionally controllable variable—the enrollment calendar. A comprehensive review of the higher education literature base revealed that the vast majority of higher education research, rooted in the psychological and sociological underpinnings of academia, has explored student attributes only after students have matriculated. This research has informed post-secondary institutions about the variables associated with student attrition, persistence, and attrition. Well-documented and researched, these variables have been confirmed as key factors that influence student persistence, retention, and attrition after enrollment has occurred (see Astin, 1975; Bean & Metzner, 1985; Pascarella, 1980; Spady, 1970; Tinto, 1975). However, the topic of latency (i.e., the time between application and enrollment) has been neglected—largely because it has been considered a pre-matriculation factor contained within the recruitment funnel and outside of the traditional agrarian instructional calendar.

Due to historical agrarian influences upon the instructional calendar, a latency period has existed between the time students apply to attend college and the time in which they enroll (actually attend classes), otherwise known as the recruitment funnel. Economic behavioral literature has suggested that time can influence the intertemporal choices consumers make when buying either a consumable or investment good. Applied to higher education, the longer it takes an institution to start classes, the more likely that consumers will be influenced by other opportunities and thus, possibly, choose not to attend. Practices and policies of post-secondary institutions have suggested that higher education is an investment product upon which consumers/students would act in a time consistent manner (i.e., committing and following through on enrollment regardless of the length of the latency period between application and enrollment). However, changes
to the delivery of education (e.g. an increasing number of institutions and online modalities) have encouraged students to approach education as a good and to act in a time-consistent manner to avoid the possible influence of other opportunities, thereby yielding more students through the recruitment funnel. In an effort to explore the influence of latency within the recruitment funnel and determine whether institutions might be able to influence enrollment yield positively through alteration of an institutionally controllable factor (the enrollment calendar), additional research was necessary.

To explore this topic, the researcher engaged a single-institution with 12 campuses (11 ground campuses and one online campus) located throughout the United States. Known throughout this study as Career College, this institution altered its enrollment calendar from offering 6 start dates in a calendar year to offering 12 start dates in a calendar year as a way of increasing enrollment and retention (i.e., more product delivered sooner to meet the needs of a possibly time inconsistent student/consumer).

Upon the exploration of nearly 4 years’ worth of data and over 32,000 student files, the researcher was able to determine that increasing the number of start dates did not practically influence students’/consumers’ purchasing behavior at Career College. Furthermore, shortening the latency period did little to nothing to impact the percentage of students persisting through the recruitment funnel. However, the findings did reveal significant behavioral differences between traditional and non-traditional students.

The results of this study indicated that the period of latency between application date and start date was slightly reduced (1.07 days) when Career College moved from a
6-start-per-year calendar to a 12-start-per-year calendar. Moving from a 6-start-per-year calendar to a 12-start-per-year calendar had little influence on the number/proportion of students who completed the recruitment funnel under each calendar system. Non-traditional students were able to complete the recruitment funnel in substantially less time than traditional students, and a greater number/proportion of non-traditional students completed the recruitment funnel than did traditional students. A greater number/proportion of non-traditional students completed the recruitment funnel than traditional students within both the 6-start-per-year calendar as well as the 12-start-per-year calendar. The findings of this study suggest that traditional students are less influenced by immediacy and opportunity costs than their non-traditional counterparts; instead, non-traditional students, who have a greater opportunity cost, place more importance upon long-term optimization over short-term actions.

In summation, the findings revealed that students are essentially consumers who will act upon their desire to purchase products (e.g., a college degree) in a time frame consistent with their own personal needs (i.e., opportunity cost), regardless of institutional efforts to influence them to do otherwise. In other words, latency is an institutionally controllable factor that does not appear to alter the course of enrollment yield among traditional students.

**Discussion**

This section presents a discussion of the results and compares these results with existing research. This section provides a synthesis of the information yielded from this study and offers points of discussion that are relevant and applicable to constituents within higher education.
Latency: Traditional and Non-Traditional Students

Although the researcher initially hypothesized that students within the recruitment funnel would behave in a time-inconsistent fashion, the results indicated this to be only partially true. While traditional students (students less than 5 years removed from completion of a high school diploma or GED) demonstrated time-inconsistent behavior, non-traditional students (students 5 years or greater removed from completion of a high school diploma or GED) demonstrated time-consistent behavior. More specifically, increasing the number of start dates per year from 6 to 12 resulted in a lower proportion of non-traditional students persisting through the recruitment funnel, but these non-traditional students also completed the recruitment funnel more rapidly than did traditional students. That is, non-traditional students spent a fewer number of latency days between application and enrollment. These two facts suggest that increasing the number of start dates does not necessarily result in non-traditional students being more committed to entering into a higher education experience, but it does suggest that they behave in a more time-consistent manner when they do decide to enroll. As Fisher (1930) reported, time-consistent choices are predicated on the assumption that once a decision is made, it will remain consistent, impacted only by exponential discounting represented as a discounted utility function.

Henderson (2008) explained that opportunity costs, simply put, are the value of a foregone activity when an alternate activity is chosen. Because opportunity costs and immediacy increase with age (i.e., they are higher for non-traditional students), the results of this study (i.e., increasing the number of start dates results in non-traditional students behaving in a more time-consistent manner) are aligned with time consistency theory. As
a result, moving to a 12-start system per year might result in decreasing the latency period between application and enrollment among non-traditional students; however, it may not produce the desired increases in enrollment numbers and, more importantly, in operational dollars that most institutions would hope for. In fact, because moving from a 6-start-per-year system to a 12-start-per-year system would require institutions essentially to double their efforts and investment in communication, recruitment services, staffing, and other student services, moving to a 12-start-per-year system may actually result in a reduction in return on investment.

**Education and Economics in a Capitalist Society**

As the number of for-profit higher education institutions has increased, higher education administrators and officials have become increasingly aware of their role within capitalist societies and the relationship between education and business/economics. According to a report issued by the U.S. Senate Health, Education, Labor, and Pensions Committee (2012), “[F]or-profit colleges have an important role to play in higher education. The existing capacity of non-profit and public higher education is insufficient to satisfy the growing demand” (p.1). In fact, this relationship between higher education and the business community has been ingrained in the fabric of the U.S. capitalist business culture, and it has become even more symbiotic with each passing year. The value of higher education today can be seen more as a pathway to upward socioeconomic mobility and greater prestige than as an individual transformative educational experience designed to enrich students’ lives and enhance intellectual growth. In this sense, higher education has become subjected as much to principles of business and economics as it has to principles of education and learning. From this
perspective, enrollment is a function of business operations and a requirement for success among all institutions of higher education today, and this is especially true among proprietary, for-profit institutions of higher education.

**Practical Application of Theory**

From an economic perspective, one of the primary impetuses for exploring latency periods between application and enrollment is to increase enrollment and to do so by the practical application of theory. The practical application of theory is a transformative tool that has the ability to influence enrollment decline just as it has influenced persistence, retention, and attrition. The factor of “time” has been referenced in the higher education research literature on persistence (Tinto, 1993), retention (Pascarella, 1980), and attrition (Astin, 1984), yet it has gone untested in a practical application (Kuh, Pace, & Vesper, 1997).

The results of this study indicated that the inclusion of additional start dates statistically influences the latency period (i.e., the mean number of latency days between application and enrollment), reducing it by 1.07 days. While this statistical significance is important, it does very little in a practical application. A one-day decrease in the latency period between application and enrollment does not provide a transformative tool for enrollment managers to influence policies or practices in a meaningful way. However, this research was necessary to determine how and whether time theory could be applied practically to the recruitment funnel as a means of increasing enrollment.

Additional results of this study indicated that increasing the number of start dates does not influence persistence through the recruitment funnel. The results of this study indicated that in an enrollment system featuring 6 start dates and an enrollment system
featuring 12 start dates, students yield at the rates of 68% and 68.3%, respectively. Therefore, attempts to increase yield rates may not necessarily be related to providing more start dates, but rather increasing yield rates may be related to better understanding and more effectively meeting consumers’ needs. For example, from an economic perspective, students are consumer agents who have choices about their purchasing decisions, and they need to feel comfortable that when the time is right to buy, they are supported by the producer--in this case, a college or university. Prompt product delivery--the latency period between purchasing the product (application) and consuming the product (enrollment)--represents only one aspect of consumers’ needs. Between 2001 and 2010, the for-profit (proprietary) sector of higher education increased in enrollment by a staggering 68% (Health, Education, Labor, and Pensions, 2012). It could be argued that this increase has been the result of applying business concepts of product delivery, customer service, and fulfillment of customer needs to a population that largely has been served in a limited market with historically poor customer service traditions. For example, at one time, students were considered by academia to be “lucky” to be accepted into the world of higher education and thus did not need to be catered to in order to solicit their attendance. However, Kuh, Kinzie, Schuh, Whitt, and Associates (2005) noted that the proprietary sector has long been known as the leader in identifying and adapting best practices of optimization to achieve results-oriented outcomes. The fact that this sector has long been known as the leader is because for-profit institutions in a competitive market are (rightly) forced to react to market demand: “For-profit colleges are owned and operated by businesses. Like any business, they are ultimately accountable by law for the returns they produce for shareholders” (Health, Education, Labor, and Pensions, 2012,
p.1). As a result, they often have successfully applied theory to practice by identifying deficiencies in the traditional method of higher education delivery and exploring means of adaptation. The willingness of the for-profit educational industry to understand, accommodate, respond to, and adapt to customer needs has been an important contributor to their explosive growth between 2001 and 2010. In other words, students have chosen to attend educational institutions that meet their evolving needs in a practical manner, and this trend is likely to continue.

**Opportunity Costs and Time-In/Consistency**

Becker (1997) classified education as a good “with large gains to be waived” (p. 119) given that (a) education consumes time and (b) the opportunity cost is unique to students’ classification (i.e., traditional/non-traditional). Simply put, enrollment for traditional and non-traditional students is a product of opportunity costs accompanied by differing choices of immediacy. The results of this study indicated that traditional students behaved, overall, in a manner that appears to be more time consistent than their non-traditional counterparts. In comparing the proportion of students who completed the recruitment funnel in years that featured 6 start dates and the proportion of students who completed the recruitment funnel in years that featured 12 starts, the researcher found that the persistence rate through the recruitment funnel of non-traditional students fell from 70.7% to 69.0%, while traditional students increased from 62.2% to 65.1%. Although not statistically significant, this finding represents a possible propensity toward more time-consistent behavior among traditional students. Given an opportunity to act upon a commitment to enroll in college, fewer non-traditional students did so. Meanwhile, traditional students acted more in line with time-consistent theory and persisted through
the recruitment funnel.

Non-traditional students possess a greater opportunity set in life (i.e., more experiences and networks that could result in immediate earnings) and therefore more opportunities to be deterred from their decision to attend college. Non-traditional students experience greater opportunity costs and are influenced more strongly by immediacy. Traditional students, on the other hand, possess a smaller opportunity set. That is, they have fewer opportunities readily available to act upon. For example, traditional students typically have fewer life experiences and a smaller network of connections. Based upon the concept of opportunity costs, the researcher expected traditional students to behave more time inconsistently because they have smaller costs to incur and a lower opportunity set to act upon. Durlauf and Blume (2007) indicated that an opportunity cost reflects the fundamental economic law of “interdependence between the volume, structure and intensity of needs, on the one hand, and the quantity, quality and structure of resources, on the other hand” (p. 260). The results of this study, however, suggest that traditional students are not as influenced by opportunity costs as their non-traditional counterparts. Instead, short-term actions, for traditional students, are weighted more heavily in lieu of long-term optimization.

**Recommendations for Practice**

Based on the results of this study, two recommendations for practice can be made.

First, before increasing the number of start dates, institutions should conduct a thorough cost/benefit analysis. The addition of start dates may influence yield for some classifications of students (e.g., non-traditional students); however, increasing the number of start dates will require institutions to devote a substantial amount of additional
resources to marketing, recruitment, student services, and enrollment. An increase in recruitment effort requires that funds be redirected from current operations, including retention efforts. These recruitment efforts tend to be three to five times more expensive than retention (1983; Tinto, 1975). As a result, the simple formula of “revenue minus expenses” should be carefully calculated and considered. Schuh (2005) has explained the expense differential:

Suppose, hypothetically, that the admissions budget for College A is $1 million and the college enrolls 500 new students per year. The cost of recruitment, simply calculated by dividing the budget by the number of new students, is $2,000. But, if the students persist to graduation and, on average, finish in four years, then the cost per student per year is reduced to $500. To replace each student who drops out, the college must spend $2,000, based on the preceding figure. So, the institutional cost of students dropping out is substantial when calculated on a per-student basis.

Suppose that College A’s persistence rate is 80 percent. If the entering first-year class consists of 400 students, an 80 percent persistence rate means that eighty students will leave after the first year. In gross terms, then, the college will have spent $160,000 on the recruitment of these eighty students, but will have received only one year’s worth of income from them. The net loss is substantial. (pp. 288-289)

Because enrollment requires complex financial and budgetary considerations, one recommendation for practice is that institutions should consider conducting a cost/benefit analysis, such as a “break-even” analysis (Larimore, 1974) or an “elasticity coefficient”
(Hoffman, 1986). Both testing measures provide opportunities for institutions to assess whether an investment in new delivery methods (e.g., an increased number of start dates) would result in not only increased enrollment but also increased revenues after expenses.

A second recommendation for practice is that enrollment managers should consider more deliberate recruitment efforts. The results of this study indicated a statistically significant difference between traditional and non-traditional students in the mean number of days in the latency period between application and enrollment. More specifically, traditional students moved through the recruitment funnel at a rate of nearly 10 days slower than their non-traditional counterparts. The fact that different categories of students (e.g., traditional and non-traditional) move through the recruitment funnel at different rates suggests that enrollment managers may want to consider different types of communication strategies and marketing approaches when targeting different consumer/student populations. Different types of communication and more focused timing of efforts may result in more efficient recruitment because these refined efforts attend more specifically to prospective students based on their particular needs. For example, a better understanding of the nature of latency periods can inform the timelines of outreach strategies. Understanding key timing points and how they influence student behavior and decision making can provide opportunities for institutions to strategically target students by classification (e.g., traditional/non-traditional, high/low socio-economic status, generational classification, or academic preparedness). The results of this study indicated that traditional students tend to move at a slower pace through the recruitment funnel than their non-traditional counterparts. With this new understanding, Career College may be able to redirect its outreach efforts at specific points within the
recruitment funnel to influence enrollment based upon students’ traditional or non-traditional classification, thereby engaging students during critical points in the process.

**Conclusions and Recommendations for Future Research**

Based on the results of this study, four conclusions and recommendations for future research can be made. The first conclusion and recommendation for future research is to examine more closely the geo-economic and socio-economic characteristics of students within the “traditional” and “non-traditional” classifications. The results of this study indicated that non-traditional students tend to move through the recruitment funnel approximately 10 days quicker than non-traditional students. By gaining a better understanding of the characteristics of each student type (i.e., traditional or nontraditional) future researchers and institutions will be able to identify, more specifically, characteristics that influence student matriculation through the recruitment funnel. For example, if researchers can identify prospective students’ income level, household size, or financial status, research can be conducted to determine whether these factors influence matriculation through the recruitment funnel, and then a more deliberate and targeted recommendation can be made to encourage persistence through the recruitment funnel. This information will allow colleges and universities to improve upon their efforts to directly brand and market their institutions, tap into new markets, and learn from past experiences. A deeper exploration into the various ways to classify students would allow researchers to determine whether socio-economic status (and other variables) can be used to predict persistence through the recruitment funnel. Likewise, this approach could help drive efforts to recruit first-generation students. By understanding the situational context of applicants, institutions can direct their marketing
efforts toward specific needs of specific student types and away from unnecessary efforts. This approach would allow the producing agents (i.e., colleges and universities) to assess behavioral tendencies of their clients (i.e., students) and therefore create stronger recruitment projection models, such as auto-regressive integrated moving averages. Strong projections result in more stable and accurate budgets, and these budgets create more stable operational environments.

A second conclusion and recommendation for future research is to determine how actual recruitment costs can be best calculated. This study was conducted in an effort to explore ways of maximizing operation dollars through yield improvement within the recruitment funnel. According to Crockett (2011), one of the most common questions about enrollment optimization relates to recruitment expenditures. To determine whether profits are being realized from enrollment, a reliable calculation of recruitment costs must be determined. Crockett has stated that a cost per applicant metric can mistakenly signal that an institution generating a lot of “soft” applications (applicants who are unlikely to enroll) is more efficient, when in fact the institution may be less efficient by generating the softer applicants. (p. 3)

Calculations in recruitment costs must be determined as accurately as possible; otherwise, erroneous data, such as “soft applicants,” can lead to inaccurate data and inappropriate decisions. For example, the decision to move to a 12-start enrollment calendar as a means of realizing financial gains must occur within the context of consideration for additional expenditures necessary to initiate and maintain a 12-start enrollment calendar. To enroll students 12 times per year rather than 6 times per year requires an increased number of
inquiring/leads who have interest in attending. To manage an additional inquiry flow requires additional staff members in admissions, financial aid, and other enrollment services. Otherwise, as previously mentioned, poor customer service may actually drive enrollment backwards and result in a reduced return on investment. Furthermore, additional costs for added class delivery will accompany each additional start date (i.e., instructional and facility costs). All of these additional expenses, combined, may be less efficient than maintaining a 6-start calendar and maximizing existing recruitment/operational expenses. However, to determine how best to increase profits by manipulating the recruitment funnel, further research should be conducted about how best to calculate actual recruitment costs.

A third conclusion and recommendation for future research is to expand higher education persistence research into the pre-matriculation stages of the process. Most research has been conducted on students during the matriculation stage (i.e., after students have begun to actually attend classes at a college or university). Pre-matriculation enrollment yield loss, however, occurs before enrollment ever begins. Therefore, institutional use of such informatics has been limited in its practical application, calling for further research to be conducted. Many higher education theorists (e.g., Rootman, 1972; Spady, 1970; Tinto, 1975, 1993) have examined students who drop out of college. Their research has led to the development of various sociological models explaining why students fail to persist after having matriculated into a college or university setting. Spady’s (1970) model linked student academic success, or lack thereof, to the degree of commitment to academic success exhibited by students and how likely students were to remain enrolled. Rootman (1972) developed a model that
expanded upon Spady’s research and illuminated the true complexity of individuals’ characteristics within the context of institutional expectations. Tinto (1975, 1993) found that after students matriculate, they must separate from their previously associated social settings, transition to their new environment, and integrate with new groups by adopting new values and behaviors of the new group.

In light of these prior studies, further research should be conducted to apply the same sociological research principles to students at the pre-matriculation stage. In other words, in the same way that Spady (1970) investigated the reasons students dropped out of college after matriculation, research should be conducted on the reasons why students drop out of the recruitment funnel before matriculation. This study provided the groundwork for conducting more research on the recruitment funnel and applying existing theoretical models of higher education.

A fourth conclusion and recommendation for future research relates to the idea of best practices within enrollment management. The proprietary sector of education realized significant growth between 2001 and 2010 (Health, Education, Labor, and Pensions, 2012). Although some in academia have considered this sector to be overly assertive in its recruitment techniques, the results are undeniable. Proprietary institutions operate based solely upon the income driven by tuition, and they do not have the option or luxury of simply hoping that students will enroll. Instead, the ability of these institutions to drive enrollment through optimum customer service, excellent delivery, and product diversification is their operational lifeline. As a result of witnessing the growth within the proprietary sector, non-profit organizations and public institutions have accepted that this approach represents a best practice and is rooted in high-quality service
and high-quality delivery. Kelly (2001) stated, “Once considered well outside of the mainstream of America’s higher education system, for-profit degree-granting institutions have emerged as an integral and increasingly influential part of the system” (p. 1). It is this cross-functional best practice adaption that will serve the higher education marketplace and foster growth through capitalism and competition. Each sector has the opportunity to learn from each other’s unique approaches to enrollment, retention, persistence, and attrition.

**Limitations**

This study was subject to the following limitations:

First, despite being conducted at multiple campuses located throughout the Midwestern and southern parts of the United States, the data collected for this study was from a single institution. Single-institution studies are subject to the confines of populations that make up that institution. For example, Career College’s student population consists primarily of a non-traditional base, which accounts for 66% of the student body. Additionally, Career College is a proprietary institution, and proprietary institutions typically exert more effort to recruit students, whereas public institutions often assume a more passive role in recruitment. Therefore, the results of this study are more reflective of the behavior of one type of student population at one proprietary institution as opposed to possible behavioral patterns of a broader, multi-college sampling.

A second limitation of this research is the type of study itself. The research methods for this study reflect a descriptive, quantitative, retrospective, applied research design. While quantitative studies such as this one have advantages, the researcher was
unable to explore behavioral intentions through individual structured interviews as might
be explored in a qualitative study or a non-retrospective research design. For example,
the researcher determined “intent to enroll” by whether students made an enrollment fee
deposit to the institution, a standard practice amongst colleges and universities. This
measurement, however, is not necessarily an accurate measurement of the subtle
differences in commitment levels and intentions of the applicants. A qualitative study
would have provided an in-depth examination of the participants’ intentions. It would
have provided flexibility, and it would have given the researcher the capacity to explore
value-laden questions.

A final limitation of this research is that the study results are confined to the time
frame and societal context in which the data were collected (i.e., 2010 through 2014). In
2008, the United States entered what has been referred to as “the Great Recession,”
which resulted from the subprime mortgage crisis (U.S. Government, 2011). As a result
of this societal context, the United States reported its first total enrollment decline in
higher education since 1996, and the United States suffered additional enrollment
decreases in 2012 (National Student Clearinghouse Research Center, 2012). The context of
the data set used for this study reflects a society still partially gripped by a recession
while undergoing a partial economic recovery. There are few points in United States
history that reflect such an unstable economic environment, and this study’s results are
confined to the historical context in which it was conducted.

Conclusion

According to a survey of members of the National Association of Colleges and
University Business Officers, a new operational emphasis designed to increase return on
investment and educational delivery will become the new norm for all institutions (Green, 2012). The attempt by Career College to influence the mean days of latency within the recruitment funnel will be one of many attempts by colleges and universities to alter the delivery of higher education. While some institutions may experiment to determine best practice, most will do so out of the necessity to remain fiscally solvent in an era of austerity and cutbacks. During this phase of exploration, for institutions in the United States, much will be learned about the product of higher education, and even more will be learned about the student consumer agent. This study has helped to illuminate the economic and budgetary realities that institutions are faced with today. Likewise, it reflects a broader yearning and need for alterations to the current system of higher education.
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