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A Study on the Influence of Social and Academic Integration on Student Retention
Through the Lens of Academic Discipline

By

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Submitted in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

Department of Education, Leadership, Management, & Policy

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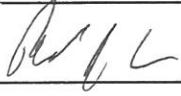


COLLEGE OF EDUCATION AND HUMAN SERVICES
SETON HALL UNIVERSITY

APPROVAL FOR SUCCESSFUL DEFENSE

Kyle D. Warren has successfully defended and made the required modifications to the text of the doctoral dissertation for the Ph.D. during this **Spring Semester 2020**.

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The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

Abstract

The purpose of this study was to examine the relationship between student retention and social and academic engagement and how it varies by academic discipline. Research indicates that students may have varied experiences within higher education based on their academic discipline. Such varied experiences may be due to integration factors related to their social and academic experience. How these differences lead to varied retention outcomes and the degree to which that is the case is an area of inquiry that is minimally explored throughout the retention literature. As such, this study explored the disciplinary differences in college student retention along with the impact of social and academic integration across the disciplines.

A nationally representative sample derived from the Beginning Postsecondary Study (2012/2014), which is administered by the National Center for Education Statistics, was utilized for this study. Using Holland's theory of careers (1966), four separate academic discipline subgroups were created for analysis along with that of the whole group base model. Following the descriptive analysis, logistic regression was used to analyze the relationship between social and academic integration and student retention.

The findings of this study indicate differences in student retention rates among the various academic discipline subgroups. Further, the results of this study indicate that both social and academic integration factors are found to be important in predicting retention in general, after controlling for all other factors in the model. It was also found that the level to which social and academic integration does relate to academic discipline varies significantly by academic discipline subgroup. Across each academic discipline subgroup, most students indicated strong agreement with levels of satisfaction with social and academic integration. Finally, the relationship between social integration and student retention was significant for all disciplines except one academic discipline subgroup. These findings support previous research which

indicates that the relationship between social and academic integration and student retention is significant and varied between the whole group and each of the academic discipline subgroups.

Recommendations for future research include continued examination of student retention at the level of academic discipline with a particular focus on those disciplines included in the artistic and investigative categories. Further, it is recommended that future research on this topic include qualitative and mixed-methods approaches.

Keywords: retention, academic discipline, dropout, attrition, persistence, first-year

Dedication

This degree and the accompanying dissertation are dedicated to the memory of my grandmother,

Margaret Marie Peace.

*For without her love and extreme sacrifice, none of my educational and life pursuits
would have been possible.*

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Since beginning graduate studies, it has been the members of the faculty of the Higher Education program at Seton Hall University who have challenged and supported me through both a master's degree and a Ph.D. The members of my dissertation committee, Drs. Chen, Kelchen, and Finkelstein, have lent their expertise along the way, exhibited patience when I needed time, and advised me when I did not know how to move forward. My most heartfelt appreciation goes to my mentor, Dr. Chen, who is not only an outstanding scholar, but simply an incredible person who wants nothing more than to see her students succeed.

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word and deed. That advice has guided many important decisions in my life; I'm eternally grateful and I've learned how to mentor others through your example.

As much work as it took to earn, do not be proud of me just for the degree attainment ... Instead, reserve such pride, while continuing to love and support me, until I effectuate the true meaning of this degree ... to influence substantive change in the field of higher education and in the lives of students.

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Chapter 1: Introduction

Student retention has been a highly researched area within the field of higher education primarily during the past five decades. Throughout this period of research, studies found that the effects of college student retention have implications for the individuals who do not complete degrees, the institutions at which they attrite, and society (Pascarella & Terenzini, 2005; Tinto, 2006; Xu, 2016). Among the reasons for interest in student retention are matters of cost to finance education and an understanding of degree completion as related to social and economic benefits (Wolniak, Mayhew, & Enberg, 2016). It is important to note that although there are effects of college student attrition that have larger societal impacts, student retention is about the success of individual students.

Individual students are affected by low student retention in the college and university setting in a number of ways, including financially. When students do not complete their education, they are still responsible for the cost of attendance up to the time of their departure. This aspect of student departure impacts individual students in an unbalanced manner as some will depart an institution with institutional or student loan debt which may also prevent or delay their transfer to another institution. The long-term financial impact of a student not obtaining a college degree has an impact on future salary earnings, job attainment, and job advancement (Murray, Ireland, & Hackathorn, 2016). According to the Bureau of Labor Statistics (2017), for individuals above the age of 25, those with a baccalaureate degree earn on average about 39% more than those with a high school diploma. For those who have completed some college but no degree, their earnings are reported as nearly 9% above those with a high school diploma, which is about 6% below those who have completed an associate's degree (Bureau of Labor Statistics, 2017).

There are also societal benefits that accompany higher retention rates for individuals. For example, the higher the earnings of individuals, the higher the tax revenues for local, state, and federal governments (Baum, Ma, & Payea, 2007). According to the Bureau of Labor Statistics (2019), the unemployment rate for those with a high school diploma was recorded at 3.7% while those who have completed a bachelor's degree have a recorded unemployment rate of 2.2%. Accordingly, when considering the differences in unemployment rates in the context of degree attainment, those with a college degree are more likely to receive health insurance which may lead to more positive health outcomes (Baum et al., 2013). Consistent with this notion, college graduates have reported more positive outcomes related to decreased smoking rates, healthier lifestyles, and more positive personal perceptions of health.

Consistent with findings of earlier research, Doyle and Skinner (2017) found that each additional year of postsecondary study increased voting probability by 7.7%. While their study found an increase in volunteering and charitable giving with each year of postsecondary education, the impact was less significant (Doyle & Skinner, 2017). According to Baum et al. (2013), those with college degrees have demonstrated more openness to the opinions of others. The societal benefits to a more college-educated society are numerous.

With regard to institutions of higher education, legislators and other higher education agencies continue to connect state funding with institutional retention. As low retention rates remain unchanged or as institutional retention rates decrease, state and other funding may also decrease (Murray et al., 2016). Furthermore, as students depart college prior to their intended graduation date, institutions lose expected tuition from those individuals. Considering possible reduction of state funding along with the loss of expected tuition funding from students, institutions are forced to make administrative decisions that could lead to increased tuition rates

to account for the difference (McLaughlin, Brozovsky, & McLaughlin, 1998). Taking such an action could serve as a deterrent to potential entering students and could also cause matriculating students to attrite due to financial concerns, thus perpetuating the cycle.

Another institutional impact related to retention is institutional reputation, specifically through rankings. Organizations which rank higher education institutions such as U.S. News & World Report do consider retention as a major portion of their ranking methodology. With regard to U.S. News & World Report, of the seven categories considered within their ranking methodology, graduation and retention rates is the first category considered, and at 22% it is one of the two categories weighed the highest as a part of the methodology (U.S. News & World Report, 2019). As college rankings have proven to be a helpful way for families to narrow down their college search (Kim, 2018; Schuler, 2017), the impact of rankings on an institution could have a direct relationship on admissions and enrollment of new students.

Student attrition has an impact on individuals and society from both financial and policy perspectives. According to a report released by Aud, Hussar, Planty, Snyder, Bianco, Fox, Frohlich, Kemp, & Drake (2010), of the American Institutes for Research, subsidies in the amount of nearly \$6.2B were appropriated by states to colleges/universities to fund students who did not persist to the second year in four-year institutions between 2003 and 2008. During this same period of time, state and federal governments provided grants in the amount of nearly \$2.9B to students who did not persist after one year (Aud et al., 2010). Considering the financial impetus, legislators and taxpayers have placed postsecondary institutions under much scrutiny related to outcomes such as retention and graduation rates. Despite such attention at various societal levels, retention rates in higher education remain substantially unchanged through the years.

Globally, while the United States was once ranked second with regard to college attainment and completion rates, the United States dropped in ranking to 15th (Callan, 2006). As the United States has fallen behind, countries such as China and India have experienced growth in the numbers of those completing postsecondary education (Palmer, Davis, Moore, & Hilton, 2010). Accordingly, the United States has also experienced a decline in the number of students graduating and majoring in STEM fields compared to other countries (Henfield, Moore, & Wood, 2008). According to Henfield et al. (2008), those countries that successfully develop an educated citizenry through postsecondary education will much more effectively compete in the global economy. To maintain a global competitive edge, it is critical that the United States not only continue research on its deficiencies related to retention, but also that the outcomes related to retention improve at a more rapid rate.

Current Status of Retention

While it is true that studies on retention and persistence are numerous, the actual outcomes related to retention have remained consistently low over the past four decades (Slanger, Berg, Fisk, & Hanson, 2015; Tinto, 2006). According to the National Center for Education Statistics (2018), the retention rate for first time, fulltime, baccalaureate-seeking students at their same institution is 81% for those who entered college during fall 2015. For the group of first time, full time, baccalaureate-seeking students who entered during the fall 2010 semester, their six-year graduation rate was 60% (National Center for Education Statistics, 2018). In comparison, the retention rate for the same group entering during fall 2010 was 79% , while the six-year graduation rate for those entering during the fall 2005 semester was 59% (National Center for Education Statistics, 2013). This comparison shows nominal improvement for both retention and graduation rates within the past seven years.

Differences in Retention Among Academic Disciplines

The voluminous amounts of research related to retention focus widely on individual characteristics, institutional elements of attrition and retention, and societal elements of such. However, few studies focus on retention which explores academic discipline as the focus of the study. Widely accepted as the earliest study on the differential relationship between academic discipline and retention outcomes, Feldman and Newcomb (1969) dedicated a chapter to research on this topic. Even though Feldman and Newcomb found that fields do not necessarily have one type of student, they found that those who enroll in particular academic disciplines show distinctive and similar characteristics.

The significance of this finding was challenged by Pascarella and Terenzini (2005) when they concluded that study results have been mixed relative to major discipline influence on student persistence; however, there is common agreement that the experiences of students in varying majors may be very different (Xu, 2016). Many disciplines have their own standards related to admission, preparation requirements, requirements for completion, and measures for success, which may lead students studying within the various disciplines to experience the university in different ways (DesJardins, Kim, & Rzonca, 2002-2003).

Difference in Retention Among Varied Levels of Social and Academic Integration

According to Tinto (1993), students who are not successfully integrated into their institution are likely to attrite. His theory posits that successful integration includes interactions with a number of campus resources including faculty. Astin, in his theory of student involvement (1984), found that interaction with faculty has a significant relationship to positive student outcomes. Furthermore, Astin (1984) found that students who have more frequent interaction with faculty are likely to express satisfaction with other areas of their college experience. More recent research supports this notion and holds that such interaction yields

positive effects on integration into college life, student learning, and student persistence (Pascarella & Terenzini, 2005; Schreiner, Noel, Anderson, & Cantwell, 2011). Interaction between faculty and students generally happens within the student's course of study.

The level of importance placed on the interaction between the faculty and student as it relates to student success can be directly linked to the outcome of student retention. Other important factors include academic performance and academic integration. With such importance placed on academic connection to the institution in the study of retention and with academic major/discipline determining a large part of the student experience, there exists a major gap in the literature as there is very limited research on disciplinary differences and, perhaps more importantly, which factors may moderate the relationship between academic discipline and retention. This is consistent with the findings of Brint, Cantwell, and Hanneman (2008) who found that social and academic integration differed between those within the sciences and engineering compared to those within the majors of humanities, social sciences, and the arts. The former group was more invested in social integration related to collaborative study improving quantitative skills and preparation for the labor market, while the latter group was more focused on interaction, ideas, and participation as a part of social integration.

Purpose of the Study

Research indicates that students may have varied experiences within higher education based on their academic discipline. Such varied experience may be due to interactions with faculty and their peers. Whether these differences lead to varied retention outcomes and the degree to which that is the case is an area of inquiry that is minimally explored. As each academic discipline carries its own pedagogical style, levels of rigor, and general orientation for interaction with its students, the study of retention based on the interaction between integration and academic discipline will add significantly to the body of knowledge related to student

retention. As such, the purpose of this study was to explore the disciplinary differences in college student retention along with the impact of student integration across the disciplines.

Research Questions

1. Are student retention rates different between students from different academic disciplines?
2. How is academic and social integration distributed across different disciplines?
3. In general, does academic and social integration relate to student retention?
4. Does the relationship between academic/social integration and student retention differ across different academic disciplines? If so, how?

Significance of the Study

This dissertation focused on student retention, which is a prominent area within higher education research. While a number of subcategories have emerged as areas of particular foci within the broader topic of student retention, there have been very few studies examining factors leading to and outcomes related to retention vis-à-vis academic discipline. As so much of the student experience takes place at the major level (e.g., peer groups, faculty interactions, internships, measures of academic success), it is important to better understand the student experience at the level of the academic discipline. Further, as much of what is experienced in terms of academic discipline is related to social and academic integration factors such as peer group interaction and faculty interaction, this study took a particular focus on integration factors and how they might lead to student retention variance by academic discipline.

Through the findings of this study and through the questions raised by this study, a major research goal was to spur an increase in the body of literature related to the differences in the experience of students at the level of academic discipline. While most models examining student retention include academic major as a predictor, very few studies have focused on academic

discipline. At the same time, much of the literature points to faculty interaction, peer group interaction, and student involvement as major influences on retention outcomes. Many of such influences affect students at the level of academic discipline.

The results of this study will provide for more attention to the differences in retention needs across academic disciplines as institutional retention plans are drafted. Attention to such will more meaningfully incorporate the formal and informal actions of faculty into consideration during institutional retention planning. Finally, this study will be significant in planning for the varying student support needs of students across the academic disciplines.

Dissertation Chapter Structure

Beyond the current chapter, this dissertation includes four more chapters. Chapter 2 includes a review of both the theories and the scholarly literature related to college student retention with a focus on engagement (integration) and academic discipline. Chapter 3 includes the research design including the data source, the sample, the research methods, and the analytical procedure. Chapter 4 presents the findings from the analysis of the data. Chapter 5 discusses conclusions, the related implications, and recommendations for further research.

Chapter 2: Review of the Literature

Student retention is a widely studied area within higher education. Although examined widely, student retention remains a very complex topic which has notably seen very little change with regard to retention outcomes (Johnson, Wasserman, Yildirim, & Yonai, 2014). As the study of retention intensified and was formalized during the past 50 years, a number of theories have been created and adapted to provide a framework for such study. In review of the theories associated with retention, several categories emerged through this formalization. Such categories include psychological, sociological, organizational, and economic factors (Braxton, 2000; Braxton, Doyle, Hartley, Hirschy, Jones, & McLendon, 2014; Chen & DesJardins, 2008; DesJardins et al., 2002-2003).

Much of the research related to student retention focuses on individual student, environment, and economic factors; however, there are certain aspects that remain less studied than others. Research shows that there are disparate student retention outcomes related to academic major; however there have been few studies that examine the topic. Each academic discipline carries its own expectations for rigor and expectations related to engagement, or integration, among its student peers and between students and faculty. This study seeks to identify how academic discipline actually does relate to student retention and how academic and social integration may play a role in such a variance.

The purpose of this chapter is to provide synthesis and analysis of the theoretical and research underpinnings that guide the study of retention, with a particular emphasis on the aforementioned topic of this study. In so doing, the theories that inform this study are reviewed and the factors that inform the conceptual model in this study are identified. This chapter includes, first, a review of the relevant theories underpinning the study of student retention. The theory review is organized into the aforementioned groupings (psychological, organizational,

economic, and integration) as is typically done in the literature related to student retention. The chapter also includes a review of Holland's (1966) theory for academic disciplines, as this was the method applied for grouping the numerous academic majors as a part of the study. Further, as this study takes a special focus on factors related to integration as they pertain to retention, there was an emphasis placed on theory related to student engagement and integration. The theory review is followed by a review of the prior research on retention studies, organized into the same groupings identified above. The chapter ends with a critical discussion of the proposed conceptual model that guided this research.

Psychological Theories

Bean and Eaton's Psychological Theory (2002)

Bean and Eaton (2001-2002) posited that one's decision to participate in higher education is made in consideration of a number of individual decisions. While these decisions may be influenced by factors from one's past as well as current experiences, how one makes meaning of those experiences is largely individual. These individual factors are strongly related to whether one remains in college or departs. In fact, Bean and Eaton (2001-2002) argued that factors such as psychological factors are the foundation for a student's decision to persist or depart.

The psychological model posited by Bean and Eaton (2000) is the primary psychological theory that guided this study. Their model is informed by four prevailing psychological theories which all consider major factors leading to the inclusion of related variables in the model and described further within this chapter. The four theories which inspired the work of Bean and Eaton (2000) include attribution theory (Weiner, 1986), self-efficacy theory (Bandura, 1977), coping or adaptability theory (Lazarus, 1966), and attitude-behavior theory (Fishbein & Ajzen, 1975).

Attitude-Behavior Theory

Fishbein and Ajzen's (1975) attitude-behavior theory, also known as the theory of reasoned action, has informed a large number of studies related to college retention and psychology. The theory is premised on the idea that the most significant cause of behavior is behavioral intention which is caused by either attitude or subjective norm (Fishbein & Ajzen, 1975; Trafimow, 2009). For purposes of this theory, attitude is defined as an individual's own evaluation of such a behavior and subjective norm is defined as what "significant others" think the individual should do (Trafimow, 2009, p. 506). The theory posits that such attitudes and subjective norms develop intentions which lead to the very behaviors described above.

Attribution Theory

Attribution theory (Weiner, 1986) considers the relationship between attributed causality and decision-making. Specifically, the attribution theory explicates the idea that an individual will be moved to a particular decision based on their perception of the causality of an event. Future decision-making may be guided by that determination. A central element of attribution theory is that of locus of control (Rotter, 1966). The concept of locus of control provides a clear explanation for the difference between an individual who attributes responsibility inwardly versus one who attributes responsibility outwardly. Those who have an internal locus of control tend to take personal responsibility for events and their outcomes, while those who have an external locus of control tend to attribute external forces for outcomes of events (Rotter, 1966). Utilizing this theory as a framework to understand the decision-making process of students has provided an often-utilized lens through which researchers better understand retention patterns at the individual level.

Coping Behavior Theory

According to Lazarus (1966), an individual who exhibits what was later described by Bean and Eaton (1995) as approach behaviors which include asking questions, building relationships, seeking information, and confronting problems is less likely to depart.

Demonstrating such coping behaviors is typically an adjustment for students who may be from high school, home, or social environments that are more yielding and accommodating. As further explained by Bean and Eaton (1995), those individuals who exhibit avoidant behaviors generally avoid stressors while in college, which may be attributed to minimal prior experience in having to adapt to a new environment. Those who demonstrate approach behaviors will be better poised to handle the adjustment that takes place in the college environment and are more apt to persist, while those who demonstrate avoidant behaviors are more likely to depart.

Self-Efficacy Theory

Self-efficacy theory (Bandura, 1977) defines self-efficacy as one's tendency to intentionally act in a particular way to achieve particular outcomes (Bean & Eaton, 2001-2002). According to Bandura (1994), self-efficacy determines thought processes which lead to certain behaviors. This takes place through four processes: motivational, cognitive, affective, and selection processes. Those who demonstrate high levels of self-efficacy may perceive difficult periods of adjustment as goals that are to be accomplished rather than obstacles that are to be avoided. Bandura (1994) describes those who have low self-efficacy as those who would likely doubt their ability to overcome obstacles and may become dissuaded from particular challenges rather than focusing on measures that aid them in success. It is noted by Bean and Eaton (2001-2002) that self-efficacy is task-specific, meaning that self-efficacy demonstrated in a specific area of one's life does not necessarily transfer to another. This has particular application in

understanding why some students who were high achievers in high school do not achieve at such a high level in college.

Discussion of Psychological Theories

The theories related to psychological factors have proven to be significant determinants of those who depart or persist (Habley, Bloom, & Robbins, 2012). The theory posited by Bean and Eaton (2001-2002) has been widely utilized, as it incorporates four psychological processes that inform the approach; all are described within this section of the chapter. The primary theory and the four approaches invoked each include aspects germane to the individual's attitude and the subsequent impact on their decision to leave. In the current study, the psychological predictor measures positive attitude toward academics. The psychological theories support the importance of such a variable within the model while also cautioning against its exclusion.

Sociological Theories

According to Tinto (1986) and Braxton (2000), sociological factors describe both the social structures and other social influences on college student retention. More specifically, sociological theories postulate that a major consideration for student retention includes the social aspects of institutions, individuals, and society (Chen, 2008). Examples of such structures and influences include family socioeconomic status, support of peers and significant others, and interaction with faculty. This study sought to understand whether academic/social integration plays a role in the variance of retention based on academic discipline. As such, this section of the theory review takes a longer form to adequately review the two primary theories informing the sociological underpinnings of this study.

Meyer's Theory of Diffuse Socialization (1970)

In perhaps one of the earliest theories connecting student socialization to the study of retention, John W. Meyer (1970) suggested that higher education institutions, by virtue of their

being, are socializing institutions. As such, they have an impact on values, personal needs, identities, and social roles (1970). In his theory of socialization, Meyer (1970) referred to the concept of the institutional role in socialization as diffuse socialization or the process of acquiring the very qualities inherent in the “charter” or social definitions of consensus (Meyer, 1970, p. 4). As noted by Morrison and Silverman (2012), while Meyer may not have spoken directly to the idea of student social integration, his socialization theory formed a foundation for much of the subsequent work on student integration. It is through that work that the following two primary theories were inspired.

Astin’s Theory of Student Involvement

Astin’s theory of student involvement (1984) served as an important addition to the literature at the time it was developed. It was during this time that the thought related to the student’s role in student development began to shift to the side of student involvement and engagement (Pike & Kuh, 2005). Astin’s theory of student involvement was rooted in his 1975 longitudinal study examining the factors related to college drop-out. Through the longitudinal study, Astin (1975) found that those factors that led to students remaining in college pointed to increased student involvement while those factors which led to students dropping out pointed to a lack of student involvement. Based on this research, Astin sought to construct a theory that placed students, through student involvement, at the center of consideration for faculty, administrators, and researchers. Through his theory of student involvement, Astin sought to construct a theory that would be of benefit to those audiences while also succinct and without the need for complex pictographs and multi-directional arrows to follow the theory. The ultimate goal of the theory of student involvement was to aid those in higher education in the design of more effective learning environments (Astin, 1984; Pike & Kuh, 2005) which would, in turn, lead to better outcomes related to student persistence.

Astin posits that typical theories which, in some way, measure student learning and development generally have three foci: content theory, resource theory, and eclectic theory. Content theory focuses on the actions of the teacher and the impact of those actions on student learning and development while not focusing on the role of the student relative to the same outcome. In Astin's theory, while acknowledging the important role faculty play in the success of the student, the involvement of the student becomes the focus of concern rather than the instruments or resources of instruction. The traditional resource theory suggests that the resources to which college administrators and faculty generally refer revolve around budget, number of star faculty, student and faculty ratios, and matters such as student enrollment, many of which are to be addressed within organizational theories. In contrast, the student involvement theory suggests that the greatest resource available is a student's time (Astin, 1984). The theory of student involvement suggests that as faculty and administrators consider policies and various programs, particularly those which have an impact on institutional culture, they must consider how these affect student time relative to that time which is dedicated to academic and non-academic pursuits.

The theory of student involvement also addresses the final of three major foci identified by Astin to be of major consideration in prior research related to student development and engagement—the eclectic theories. The eclectic theories are those which attempt to tailor particular experiences around individualized student needs. This has been achieved through course curriculum, extracurricular activities, and culminating experience projects. Although Astin agrees with this approach in the abstract, he identifies the difficulty in creating an individualized experience for all students, particularly any efforts past what currently exists such

as the ability to select minors, independent studies, independent choice of electives, and student-related activities.

According to Astin's theory of student involvement, the most significant factors of student involvement which have positive outcomes for students include the following: living on campus, honors programs, student-faculty interaction, athletic involvement, involvement with student government, and high dedication to academic studies. The findings of the research which had the largest impact on positive student outcomes were interaction with faculty (Astin, 1984, p. 525). According to Astin (1984), students who have frequent interaction with faculty were more likely to express satisfaction with all other areas of their college experience.

Tinto's Integration Theory

Tinto's theory of student integration focuses on student retention and posits that students are less likely to drop out if they are connected to the institution both socially and academically (Tinto, 1975). Tinto's theory has a basis in Durkheim's theory of suicide (1961), which states that suicide is more prevalent among individuals who are not sufficiently integrated into society. More specifically, Durkheim and Jensen (1962) posit that instances of suicide may increase in the absence of two types of integration which include moral integration (or values integration) and collective integration. As Tinto (1975) based aspects of his theory on Durkheim's theory, he related society with the postsecondary institution and suicide to student dropout from that institution. Tinto further correlated the two types of integration identified by Durkheim with elements of college life by connecting moral integration into society with a student's integration into the values of an institution, while correlating societal collective integration with sufficient interactions with others at a college/university.

Tinto (1975) found that students are more likely to be retained in college if there is sufficient social and academic integration, both formal and informal. He argues that with the

presence of sufficient social and academic integration, there must also be congruence between the individual and the institution. The social integration described by Tinto may include peer group interactions that are formal and informal, interactions with administrators, living within residence halls on campus, joining clubs or organizations, and identifying peers with whom relationships are initiated (Seidman, 2012). Academic integration within the institution may include intellectual development, formal and information interactions with faculty, participation in research opportunities, and grades earned by the individual.

Tinto (1975) also focuses on individual characteristics which have been found to relate to student retention. In his theory (1975), he identifies four categories of individual characteristics of significance: family background, characteristics of the individual such as ability and gender, past educational experiences, and goal commitment. Individual characteristics as well as social and integration have been posited by Tinto (1975) to significantly account for drop out, although he further argues that drop out is a longitudinal process that may include an absence of any or all of the identified factors.

Chickering and Gamson's Seven Principles for Good Undergraduate Practice (1987)

As the authors note, this brief piece incorporates nearly 50 years of research into teaching and student learning to provide guidance on the best methods for educating students both inside and outside of the classroom. As mentioned by Chickering and Gamson (1987), their framework for the seven principles aims to inform educational practice that prepares students to “understand and deal intelligently with modern life” (p. 3). Acknowledging the earlier work of Astin (1984), who assisted in the preparation of the Seven Principles for Good Undergraduate Practice, Chickering and Gamson built on points from the theory of student involvement along with research on student persistence to develop the principles.

A particular focus for this study evolved around the first finding from the Seven Principles for Good Undergraduate Practice, which is the importance of contact between students and faculty. As also noted by Astin (1984), Chickering and Gamson (1987) suggest that frequent contact between students and faculty is the most important factor when considering student involvement and motivation, which is found to lead to positive student retention outcomes. As a part of this first principle, Chickering and Gamson (1987) note that when students have the opportunity to get to know faculty members past the transactional interactions, the relationship leads to improvement of their intellectual commitment and allows for them to think more deeply about their own values and their future, thus increasing the possibility of positive attitudes related to their educational experience.

The remaining six principles, aimed toward faculty, administrators, and researchers, include the following: develops reciprocity and cooperation among students; uses active learning techniques; gives prompt feedback; emphasizes time on task; communicates high expectations; and respects diverse talent and ways of learning. In terms of respecting diverse talent and ways of learning, Chickering and Gamson again find alignment with Astin (1984) as they further the importance of institutions offering a variety of learning approaches. Chickering and Gamson mention the ideas of individualized course curricula, individualized degree programs, and independent study opportunities. These methods for student learning and engagement are emphasized within both theories reviewed to inform this literature review.

While describing their first principle on the topic of faculty and student interaction, Chickering and Gamson provide practical examples of meaningful interactions between faculty and students. These examples include senior faculty teaching first-year seminar courses, faculty teaching small seminars outside of their area of expertise, and faculty providing opportunities for

students to aid in research, as well as opportunities to interact with small groups of students outside of the typical classroom setting (Chickering & Gamson, 1987). While these examples are set in the context of faculty influence, each also incorporates an aspect of peer collaboration and integration that has been found to significantly increase rates of student retention.

Discussion of Theory Related to Integration Factors

Tinto's (1975) landmark theory introduces the importance of social and academic integration in the study of student retention. Importantly, Tinto emphasizes that such social and academic integration may occur in formal or informal modalities. While other research has emphasized the importance of faculty and administrative interaction with students, Tinto's theory introduces this interaction as essential to a student's integration into the college setting. Further, and as supported by Terenzini and Pascarella (1984) and Chickering and Gamson (1987), Tinto underscored the inclusion of individual factors such as pre-college factors, family background, and goal commitment. The inclusion of such factors within research models related to retention remains essential.

Pascarella and Terenzini (1991) posit that if sociological factors are considered alone, other important aspects of individual students may be overlooked. Psychological theories and sociological theories, therefore, work well when both are incorporated into a research model on student retention matters. Astin introduces the theory of student involvement with the premise that the key to student learning and development lies with the amount and quality of the time students spend engaged or involved in their academic experience. The theory further posits that faculty and student interaction within that involvement is the most significant factor for student engagement. Such engagement varies by academic discipline, considering the rigors and other demands of each academic discipline. As a practical implication of the theory, Astin states that "the effectiveness of any educational policy or practice is directly related to the capacity of that

policy or practice to increase student involvement” (1984, p. 519). In so doing, he emphasizes the importance of such student involvement in the consideration of student success or, as it relates to this study, student retention.

Chickering and Gamson (1987) authored a theory that became the basis for rich research into student retention. Their ideas on meaningful interactions between faculty and students provide guidance that has contributed significantly to the study of student success and retention. A limitation of the theory however is in the presentation. The Seven Principles for Good Undergraduate Practice, while influenced by decades of research, is presented within just a few pages. How previous research was factored into each of the principles and details on how the theories are interrelated are not provided. While framed as a limitation, this is also consistent with the presentation of Astin’s theory of student involvement (1984) which was decisively designed in a manner of simplicity.

Together, the theories presented by Tinto (1975), Astin (1984) and Chickering and Gamson (1987) along with influences of Meyer (1970) are major theories that speak to what many other researchers agree to be the essence of student engagement—the basic premise that student learning happens largely as a result of what students do (Gellin, 2003; Kuh, Hu, & Vesper, 2000; Pascarella, Whitt, Nora, Edison, Hagedorn, & Terenzini, 1997; Pike & Kuh, 2005). Astin’s theory of student involvement, directed to faculty, administration, and researchers, focuses largely on how to engage students in their college experience. A benefit of the theory is that it is one of the first of its time to place the individualized experience of students at the center of their engagement in class and within the institution. For example, the theory of student involvement would guide faculty interested in better engaging students within their course not only to consider modifications to their own teaching methods, but also to pair that

with deeper consideration of how students spend time inside and outside of their class with respect to the material. Astin's theory would advise small group learning, individual time with faculty inside and outside of the classroom, and opportunities for students to guide their own learning of the subject matter.

Although these theories have contributed significantly to this field of study, a major limitation of Astin's theory was the sample used to develop the theory. Astin's theory of student involvement is based largely on his studies on why students drop out of college. As such, the sample he considered when deriving his conclusions was largely based on those who dropped out rather than largely on those who persisted. Another limitation is likely the result of Astin's desire to present the theory in such a simple way. In so doing, it lacked a sufficient amount of detail and specificity, making it less than ideal for those researchers who sought to receive more of an empirical understanding of the theory. While Chickering and Gamson's theory has been extremely influential, as noted it is a very succinct piece that provides little explication past its statements which are based on 50 years' worth of research (Pike & Kuh, 2005).

The variables addressing sociological factors within this study are categorized as social and academic integration, and include a composite variable on social and academic integration as well as a variable on the extent to which the student feels as though they are a part of the institution. The inclusion of such variables is guided by the theory on the topic which suggests that inclusion of such factors is essential.

Organizational Theories

Organizational theories in student retention describe the structure of institutions and the organizational behaviors within institutions. Such structures and behaviors of faculty and staff have been proven to be a part of the decision process for students to remain or leave college (Braxton et al., 2014; Tinto, 1986). According to Chen (2012), significant research has

concluded that there is a relationship between institutional characteristics such as minority student status, size, selectivity, control, and faculty status and dropout rates within institutions.

Bean's Industrial Model of Student Attrition (1983)

The primary organizational theory considered as a part of this study is Bean's industrial model of student attrition (1983) which is adapted from the causal model of turnover by Price and Mueller (1981). Price and Mueller developed the causal model as a theory to explain the underpinnings of attrition within organizations. Bean adapted the theory and its many variables for application to student retention within higher education. The industrial model of student attrition has been used in a large number of studies to provide context in the study of the institutional factors related to student attrition (Cabrera, Castaneda, & Castaneda, 1993; Eveland, 2019).

Price and Mueller's (1981) original model contains 10 variables along with two intervening variables which include: routinization, participation, instrumental communication, integration, distributive justice, receiving good pay, opportunity to obtain a better job within the organization, opportunity, memberships in professional organizations, and kinship responsibility. The two intervening variables, which interact with a number of the preceding variables, are satisfaction and intent to stay (Price & Mueller, 1981). Although adapted directly from Price and Mueller's theory, Bean's theory aptly converts a number of the variables to those which would be more appropriate in the context of attrition in higher education.

The variables within Bean's theory (1983) include intent to leave, satisfaction, grades, practical value, development, routinization, instrumental communication, participation, integration, courses, distributive justice, campus organizations, opportunity, marriage, and dropout. While the focus shifted from employee satisfaction (Price & Mueller's theory) to student satisfaction, several key variables had to change as well. As such, intent to leave (one's

job) was substituted for intent to stay (in college). The variable for pay in the earlier theory was substituted for grades, practical value, and development in the Bean theory. The “work” variable from the earlier theory is described as “courses” in the Bean theory, while the professionalism variable in the earlier theory was replaced by the “memberships in campus organizations” variable in the Bean theory (1983).

Bean’s Model for Student Departure (1980)

Bean’s (1980) model for student departure was also adapted from Price and Mueller’s (1981) model of organizational turnover, which considered institutional factors such as background characteristics of the student, GPA, gender, and quality of the institution. Bean (1980) did conclude that institutional commitment likely leads to student retention. According to Habley, Bloom, and Robbins (2012), the two most important variables from the student departure model were institutional quality and opportunity. When studying institutional satisfaction, Bean’s (1980) study looked at the most important factors influencing dropout for women and men. While institutional commitment ranked at the top of the list for both women and men, the remaining variables differed in order of importance, which led to Bean’s conclusion that men would leave an institution even when satisfied while women were less likely to leave an institution at which they were satisfied.

Discussion of Organizational Theories

The industrial model of student attrition informs this study particularly in the context of institutional factors. Overall, this model emphasizes the importance of pre-college variables and how those factors predict institutional adjustment as well as student success and its relationship to the fit between students and institutions (Cabrera et al., 1993). Its variables related to organizational, environmental, and personal factors have been supported by empirical testing (Cabrera et al., 1993). Although organization factors remain an area of limited study with regard

to their relationship to student retention, the theories reviewed in this section support the application of institutional variables within the model discussed later within this study.

Economic Theories

Human Capital Theory (1964)

According to Habley et al. (2012), economic theory related to student retention is largely based in human capital theory (Becker, 1964). Human capital is described by Becker (1964) as those activities or events that benefit humans in a way that is not physical or financial such as educational programs, training programs, and health care. These events and activities certainly benefit the human being, but they cannot be quantified in the way that other economic resources, such as currency, can be quantified. According to the theory of human capital (1964), if a student does not believe that the benefits of completing a degree outweigh the cost of staying in school, they will likely drop out. Although human capital theory addresses a number of topics outside of education, Becker (1964) suggests that education and training are central investments in human capital. Human capital theory is cited in much of the student retention research during the course of the past 20 years (Chen, 2008; Habley et al., 2012).

Discussion of Economic Theories

Within the study of student retention the inclusion of economic factors has proven to be essential, as is demonstrated by the integrative models. The theory of human capital (1964) found that the importance a student attributes to the benefits of the educational process versus the costs of education is a major factor in their decision to remain. The financial factors included within this study include net cost of attendance and jobs while enrolled. Inclusion of the variable which considers net cost of attendance is directly supported by the human capital theory, while the financial variable dealing with jobs while enrolled is supported by the integrative theory.

Integrative Theories

According to Braxton (2000), early research related to student retention was largely organized into two major groupings: studies that focused on student-institution fit and those which focused on economic impetus. Braxton is careful to note that although these are the two general groupings, they are not mutually exclusive of each other. Braxton (2000) further notes that with the exception of Bean (1982), the earlier student fit theories and research did not incorporate independent variables into their models which dealt with financial factors. The early thought related to the exclusion of financial variables was that consideration of such variables was most considered in the decision to attend rather than once students enrolled (Braxton, 2000).

In a major theoretical shift, Tinto (1993) revised the student integration model to include economic factors within his model. Although this integrated approach represented a breakthrough in student retention studies, it did not lead to an immediate shift in how student retention research was conducted. Instead, new integrated research models were introduced to better explain how economic factors and non-economic factors have an impact on student retention decision-making.

Holland's Theory of Careers

As one of the major questions guiding this study indicates, this study focused on variations in retention across academic disciplines. Across higher education the large number of majors complicate attempts to provide analysis across academic disciplines. Holland (1966) introduced the theory of careers, which has provided guidance for understanding differences in thought and behavior of both students and faculty in different academic environments (Smart, Feldman, & Ethington, 2000). Holland's theory does consider student satisfaction, student stability within higher education environments, and student achievement in varying academic environments.

Holland's work concluded that there are six personality types and also six comparable academic environments. He (1966) posits that the congruence between those personality types and the accompanying academic environments determines student retention, student satisfaction, and student achievement (Smart et al., 2000). Holland (1966) posits that the academic major or discipline choices made by individuals is a reflection of their life experiences which forms their personality. In fact, after 20 years of additional research on the topic, Holland (1985) reaffirms in further research on careers that individual choices regarding careers are inspired by one's life history and are also a reflection of one's personality.

The six personality types identified by Holland (1966) and noted by Smart, Feldman, and Ethington (2000) include the following:

- **Realistic Types:** Realistic types are described as those whose personality type lends to actions that utilize tools, objects, and machines. These individuals do not typically engage in therapeutic, interpersonal, or academic activities. Others see these individuals as being hands-on and direct.
- **Investigative Types:** These individuals are inclined to appreciate the process and exploration of knowledge and they excel at mathematical and scientific competencies. Others may perceive these individuals as intelligent and introverted.
- **Artistic Types:** Individuals of the artistic type more enjoy and are competent in the fine arts, music, and other similar subjects. These individuals are not confined by established norms.
- **Social Types:** Individuals who are oriented to the social type tend to be seen as outgoing and caring. They are inclined to the type of work that assists others while not necessarily engaging in the type of work that would be seen as more machine-driven or technical.

- **Enterprising Types:** Individuals identified as enterprising types engage in activities that include influencing others and leading others in the achievement of common goals or even financial prosperity. These individuals see themselves as confident socially; others see them as outgoing and enthusiastic.
- **Conventional Types:** Conventional types are described as those who engage in work and habits that are associated with a routine. These individuals may be described as methodical and are seen by others as agreeable. These individuals value formal accomplishments along with authority within both personal and more formal settings.

Holland's theory has impacted not only the study of majors within higher education, but also the fields of career counseling and interest assessment. As such, Holland's theory has been referenced in the creation of various interest inventories which have also been utilized to substantiate the theory. In fact, in a study including more than 7,700 college students and nearly 1,400 employees, Laing, Swaney, and Prediger (1984) found that congruence between choice and interest in careers was positively associated with persistence within the choice expressed. A limitation of the use of Holland's theory (1966) is in accounting for double majors. This becomes particularly complicated when a student chooses more than one major, each very different from the other (Smart et al., 2000). As such, the theory is best applied when a primary major can be applied.

In addition, it is found within the student retention literature that each academic discipline has its own cultural expectations related to integration factors. Such factors may include communication styles, peer-to-peer collaboration expectations, student interaction with the faculty member, and rigor of the respective academic curriculum. While the topic of the relationship between academic disciplines and student retention has been largely unexplored, the

subtopics mentioned within are found within the literature have also been found to be unexplored.

Review of the Literature

Born out of the theoretical frameworks influencing the study of student retention, there are a number of factors that have been empirically proven to influence outcomes related to student retention. These factors, which appear as variables within this study, may be grouped into three categories to include individual characteristics (demographics, psychological factors, educational aspirations, pre-college preparation, economic factors, college experience), social and integration factors (social and academic integration), and institutional characteristics (institutional control, institutional selectivity, and size).

Academic Major

As stated previously, the literature focused specifically on the relationship between academic major and retention yields a small number of studies although there is clear data to show that there are significant variances in student retention across disciplines (DesJardins et al., 2002-2003). In review of the literature, it was found that the literature which focuses on the relationship between academic discipline and retention is generally limited to certain majors or academic foci such as STEM and other specialized areas.

The typical setting for the literature focusing on academic discipline and retention was at the institution level and quantitative in nature. As such, a number of the studies available and which yielded data were at the campus level. Among those studies, the findings related to academic major have been consistent in that outcomes related to retention have varied significantly across the different academic fields and groupings.

DesJardins, Kim, and Rzonca (2002-2003) completed a quantitative study at an institution which enrolls nearly 7,000 new and transfer students each fall semester, the focus of

which was on the 4,000 new students. Utilizing institutional data and data from ACT, the researchers applied logistic regression to test the factors related to drop out. DesJardins et al. found that humanities majors have odds of dropping out that are about 1.75 times higher than social science majors, the reference group. Further, they found that education majors have odds of dropping out that are about 47% of social science majors, while business majors have odds of dropping out that are about 2% of social science majors, controlling for all factors. The researchers further found that of those students who progress to sophomore year, engineering, business, and health majors have much higher odds of graduating than those who are social science majors. In fact, they further found that business students have odds of graduating that are about 8.6 times higher than those of social science majors, controlling for all factors (DesJardins et al., 2002-2003).

The findings in the study by DesJardins et al. (2002-2003) were consistent with the findings of the study by Xu (2016) which focused on retention outcomes for STEM majors. Xu's study was quantitative and within the setting of a mid-size public institution. Xu found that attrition related to STEM students was related to non-exposure to high quality educational activities in the classroom, lower cumulative GPA, and a lower level of active learning experiences. Non-STEM students' attrition decisions were found to be related to lower SES, a weaker commitment to degree completion, and insufficient access to faculty for support (Xu, 2016).

Using the same data, Xu (2016) completed a study that focused on all majors rather than just STEM versus non-STEM students. Consistent with the findings of other studies, Xu (2016) found that there were substantial differences in intentions to drop out across colleges. Importantly, Xu found that students within the various schools (within the one-campus research

setting) reported unique and differentiated academic and social experiences. This notion is consistent with the extant literature on the topic (Pike & Kuh, 2005).

In their study on the relationship between academic discipline and retention, Sauer and O'Donnell (2006) completed a quantitative study on the impact of introducing new majors within institutions. The study examined institutional data collected over the course of 11 years within a private college in the Northeast United States. Although nearly 7,600 students responded to the survey over the course of the 11 years of institutional data collection, the sample consisted of 349 (4.5%), which represents the number of students who chose to enroll in new majors during their first year. Sauer and O'Donnell (2006) found that students who chose a newly introduced major had odds of dropout that were about 22% of those in traditional majors after controlling for such factors as family income, high school average, importance of family and friends, degree aspirations, and others. Although slightly unique from other literature on the relationship between academic discipline and retention, this research supports the findings of previous research which concludes that academic discipline has a significant relationship to student retention.

Major Field of Study

In earlier literature related to student retention, it is widely posited that the academic discipline or major field of study plays a major part in the life of the student and is a significant factor in predicting student persistence (Weidman, 1989). As stated by Parsons and Platt (1973), the academic department is a significant source of influence on students considering their interactions with peers and faculty. In more recent studies, the major field of study continues to be a significant factor in student persistence. While variables related to major field of study are included in most student retention and persistence models, there are very few studies examining retention by major field of study. Those which do address the topic have been found to be

largely related to STEM majors, health sciences majors such as nursing, and other professional schools (House, 2000).

In a study within a single institutional setting and with a sample size of more than 730 students, Xu (2016) found that students reported experiences that were unique to their specific college regarding social and academic experiences. Xu also found that there were significant rates of intention to drop out across the various colleges included in her study. Within this study, it was found that the lowest intentions for dropping out were among students majoring in nursing and business. In this study, students within communication and fine arts showed the most intention to drop out.

Accordingly, it was found within the study by DesJardins et al. (2002-2003), which included a single institutional sample of nearly 2,500, that academic discipline is a significant variable for inclusion in models related to retention. DesJardins et al. found that the odds of dropping out for those majoring in humanities disciplines is nearly 1.75 times higher than that of social science majors. Within the same study it was found that education majors have odds of departure that are nearly 47% of social science majors' odds. Consistent with the literature, this study also found that humanities majors had higher odds of departure during their first year, while engineering and business majors had lower odds of departure during the first year. Accordingly, health majors have odds of departure that are nearly 57% that of social science majors' odds.

Although there is a dearth of literature that focuses specifically on major discipline, variables related to major discipline are typically included within student retention and persistence models and have been found to be significant within the models. More research is

necessary to better understand the relationship between major discipline and outcomes related to student retention.

Discussion of the Literature on Academic Discipline

It has been found in many retention studies that student retention outcomes vary based upon academic discipline. The limited number of studies referenced within this section each have findings that support this notion within the existing literature on this topic. The gaps in the literature related to academic disciplines and student retention, however, are pervasive. Within the literature, there are a number of studies which address retention related to specific areas such as STEM and health science majors such as nursing. However, the need to better understand the relationship between academic major and its relationship with student retention is not being adequately addressed within the research. It is acknowledged within the literature that more research is necessary to better explain the variance in student retention outcomes based on academic discipline (Crowe, 2015; DesJardins et al., 2002-2003; Smart et al., 2000; Xu, 2016; Xu, 2016).

Individual Characteristics

Demographics

Age. Feldman (1993) found that age is a significant predictor for student departure. Accordingly, Feldman found that students ages 20 to 24 were 1.77 times less likely to persist than students age 19 or younger. These findings were supported by Sydow and Sandel (1998) in their study examining factors related to persistence. In the study by Sydow and Sandel, the age group of 20 to 25 yielded the highest level of dropout (40%), while the age group of 36 and above was the second highest (28%). A more recent study found that senior students experienced drop out at a significantly higher rate than students at other grade levels. Although research on late student dropouts is quite limited, in their study on early versus late dropout, Ma

and Cragg (2012-2013) define late dropout as past the second year. Within their study, the findings support earlier research by Tinto (1993) which suggests that factors related to student attrition do vary throughout different points of their matriculation.

Race/Ethnicity. Race and ethnicity have proven to be important predictor variables when studying student retention. Accordingly, several studies find that Black and Latino students, when compared to White students, appear to also be in lower socioeconomic groups, which has a negative impact on their chances to persist in college (Baker & Robnett, 2012; Grier-Reed, Arcinue, & Inman, 2016; Kao & Thompson, 2003; Rodgers & Summers, 2008). More specifically, according to the National Center for Education Statistics (2012), 39.5% of Black students graduate from college within 6 years in comparison to their White counterparts, who graduate at a rate of 61.5%.

Gender. The national data related to gender as it pertains to retention clearly indicates that female students are retained at a higher rate than male students (NCES, 2016). In their report, NCES (2016) indicates that among those students who began studies in four-year institutions during the 2011-2012 academic year, upon entering their third year 18.6% of male students were no longer enrolled compared to 14.2% of female students who were not enrolled. Consistent with this trend, NCES (2017) reports overall six-year graduation rates of those beginning studies during the fall 2010 semester at 63% for females and 57% for males. Consistent with these findings, Ishitani (2016) in her study of first-year persistence utilizing data from the national Beginning Postsecondary Study found that female students were 29.2% less likely to drop out during their first year compared to males. Ishitani also noted an important finding within her study which concluded that the effects of gender (and other variables) did not

remain constant throughout the various years of study. In this case, the effect diminished as students moved into the second year of study.

While the national data finds that female students retain and graduate at a higher level than male students when considering the raw numbers, a number of studies have found that when controlling for other factors, the findings are mixed with regard to whether gender is a significant predictor of retention (DesJardins et al., 2002-2003; Marsh, 2014-2015).

However, when examining studies related to specific academic majors and controlling for other factors, gender has proven to be a significant predictor of retention. In the study by Sauer and O'Donnell (2006) which utilized data from the Cooperative Institutional Research Program along with institutional data from a private college in the Northeast United States to examine retention at the level of academic discipline, women were significantly less likely to drop out compared to men. In their institutional study examining factors related to late dropout (dropout after the second year of college), Ma and Cragg (2012-2013) found that females were 1.38 times more likely to leave their institution during the early years (first two years) than male students when controlling for all other factors.

Socioeconomic Status. Socioeconomic status consistently appears as a significant factor in the literature germane to student retention including in earlier studies (Bridgeman, McCamley-Jenkins, & Ervin, 2000). According to Chen (2008), there are generally two types of variables utilized within the literature to represent socioeconomic status. The example of one would be a composite variable and the other a single variable which includes measures for both family income and parental education. The notion that socioeconomic status can be determined by use of such means is supported in other similar research such as the study by Allen, Robbins, Casillas, and Oh (2008), whose study included a sample size of nearly 7,000 respondents across

23 four-year institutions. Allen et al. found that students of higher socioeconomic status had a higher first year GPA and were more likely to persist, which is consistent with the existing literature. Allen et al. also found that students with higher socioeconomic status were actually more likely to transfer to another institution rather than drop out altogether. The existing literature significantly suggests that socioeconomic status is important for inclusion in models predicting retention.

First-Generation Immigration Status. The literature related to first-generation immigration status suggests that first-generation students are more likely not to persist in college even after controlling for first-year academic performance (Allen et al., 2008). Other studies find that even when controlling for other factors that serve as measures for achievement, first-generation students consistently show a significant disadvantage in retention (Dickens Callen, 2018). Utilizing longitudinal data from the Core Items survey administered to University of California students and including a sample size of nearly 60,000 respondents, Kim and Sax (2009) found that first-generation students were much less likely to interact with faculty informally and with regard to research. Interaction with faculty and student participation have been significant predictors of student retention across all demographics. These and other more recent findings confirm the inclusion of first-generation status as essential in models predicting student retention and persistence (Fike & Fike, 2008).

Psychological Factors

Positive Attitude About Academics. Student attitudes toward academics have been proven to have an effect on their retention outcomes. A positive attitude toward academics was clearly associated with better student adjustment and motivation after controlling for other factors such as academic performance (Allen et al., 2006; Nes, Evans, & Segerstrom, 2009). Such optimism has led to decreased dropout rates and even higher GPAs. Accordingly,

Friedman and Mandel (2009) found that compared to those who did not persist, those who did persist reported higher academic and social motivation. Although it is widely accepted that a positive attitude about academics is positively associated with increased levels of retention, in a study by Pleitz, MacDougall, Terry, Buckley, and Campbell (2015) these findings were upheld, but it was also found that students enter college with naïve expectations about the college experience. It was found that incongruence between expectations and reality is related to higher levels of attrition.

Highest Level of Education Planned. It is important to consider educational aspirations in the study of student retention as both earlier and more recent studies have found a strong relationship between educational aspirations and retention (Chen, 2008). Those found to have the highest educational aspirations (such as completing doctoral or professional degree studies) are found to persist at a higher rate (Habley & McClanahan, 2004). It is also found in the literature that occupational aspirations and high academic aspirations are positively related to elevated levels of student retention (Perna & Titus, 2005).

Pre-College Preparation

High School GPA. The literature finds that high school GPA is a strong predictor of college student retention (Gifford, Briceno-Perriott, & Mianzo, 2006). In their study utilizing the Student Motivation Questionnaire (SMQ) to test factors associated with retention, Friedman and Mandel (2009) concluded similarly in their findings that there were significant differences in high school GPA between those who did return and those who did not return. In a more recent national study, Chen and St. John (2011) found that compared to those with a low high school GPA, students with a higher high school GPA had a significantly higher retention rate, thus supporting earlier findings and the inclusion of high school GPA within the model. In their national study investigating pre-college predictors of student persistence, Robbins, Allen,

Casillas, Peterson, and Le (2006) found overwhelmingly that high school GPA was a significant predictor of college retention and persistence, and further support its inclusion in models predicting college retention.

SAT/ACT Scores. In a study by Laskey and Hetzel (2011) which investigated the factors related to retention specifically for at-risk students, it was found that both high school GPA and entrance exam were not significant predictors for the participants within the sample. The sample consisted of students who were participants in a specialized immersive program for at-risk students. These findings are not consistent with earlier and more recent findings related to entrance scores; however, it is important to consider the sample and the opportunity for further research on the retention of at-risk students.

Contrary to the overwhelming findings in support of inclusion of entrance exam scores (and GPA), some researchers caution that entrance exams alone may disadvantage certain groups as they do not take into account differences in resources and preparation. Robbins, Lauver, Le, Davis, Langley, and Carlstrom (2004) completed a meta-analysis which found that bias related to inclusion of standardized exams, alone, to account for pre-college factors would be reduced by inclusion of other factors such as GPA.

Economic Factors

Pell Grant Awarded. Pell grants are an important indicator for inclusion within the model as they are awarded based on need. In their study utilizing the BPS survey data, Chen and Desjardins (2008) found that Pell grants had a positive effect on persistence for low-income students. In their study examining financial aid in dual enrollment and advanced placement participation, Lin, Borden, and Chen (2018) also found Pell to be a significant predictor of student persistence, reporting a 4% decrease in odds of dropout per standard deviation increase in Pell amount received. In their review of research published since 2010, Barbera, Berkshire,

Boronat, and Kennedy (2017) emphasize the findings of major studies which indicate that financial aid such as the Pell, which minimizes the net price of attendance, overwhelmingly lead to a decrease in dropout.

Federal Work Study Received. Like Chen and DesJardins (2010), Pascarella and Terenzini (2005) find that those students who participate in work-study programs generally persist at a higher rate. This is consistent with Chen's (2012) study on the institutional characteristics related to college student dropout. In the 2012 study, Chen found that a one standard deviation increase in federal work study funds was associated with a 19% decrease in odds of dropout. Although this is the case, St. John and Starkey (1995) found that the more a student works, particularly those from low and middle income families, the rate of persistence decreases. This notion is supported in more recent studies which find that students who work fewer hours experience increased academic success (Mendoza, 2012; Scott-Clayton & Minaya, 2016). Accordingly, considering its strong relationship with persistence, first-year student employment is an important factor for inclusion within the model.

Total Loans Received. In Kim's (2007) national study of the effect of loans on students' degree attainment, it was found that the amount of loan amounts was a significant predictor of retention and also that the relationship varied by various subgroups. Accordingly, Kim found that for an increase of \$1,000 in total student loans, low income students had a 1.6% lower likelihood of degree attainment.

Dixon (2018) found that although the increase in federal loans was negatively associated with persistence, the increase in total loans received was positively associated with student persistence. This particular study utilized data from Integrated Postsecondary Education Data System with an institutional sample size of nearly 3,200. In their study on the relationship

between college financing choices and academic performance, Stoddard, Urban, and Schmeister (2018) utilized administrative panel data from the Montana University System that spanned from 2002 to 2012 with a sample size of just more than 97,000 students. In comparing students majoring in STEM disciplines to those who are not, it was found that those who do utilize student loans are about 2.6% less likely to major in STEM disciplines. While this is the case, the study also found that an increase of non-loan aid leads to about a 0.7% increase in likelihood of becoming a STEM major. Ultimately, the researchers' findings within this study are consistent with previous research which suggests that receiving a loan does not relate positively to persistence.

College Experience

College GPA. The inclusion of college GPA within models to predict persistence and its relationship with student retention has been substantiated within the literature. Chen and St. John (2011) in their national study found that a standard deviation increase in first year college GPA related to a 93% increase in the odds of persistence compared to dropout. An earlier study by Titus (2004) based on data from the Beginning Postsecondary Student (BPS) survey, which included a sample size of nearly 5,200 and spanned 384 institutions, found that with a one standard deviation increase in academic performance as measured by college GPA, the student's probability of persistence increases by 8%. These findings are significant and also consistent with the many other studies which have found that college GPA is a significant predictor of student retention.

Social and Academic Integration

Much of the earlier research related to student retention is grounded in theory that suggests that higher levels of academic and social engagement, or integration, is positively associated with higher levels of student retention (Braxton et al., 1997; DeBerard, Spielmans, &

Julka, 2004; Pascarella & Terenzini, 2005; Tinto, 1975). More recent studies overwhelmingly support these variables for inclusion in models of student retention (Braxton, 2008; Friedman & Mandel, 2011; Jensen, 2011; O’Keeffe, 2013; Pleitz et al., 2015). Accordingly, Kuh, Kinzie, Buckley, Bridges, and Hayek (2006) examined five areas found in the literature to be significant to social and academic integration: faculty-student contact, peer interactions, experiences with diversity, co-curricular activities, and student satisfaction. Social and academic integration has proven to be such a strong predictor that Pleitz et al. (2015) found that students who experienced incongruity in their expectations of social connectedness compared with their experiences were more likely to depart.

The BPS survey provides index variables for both social and academic integration (Flynn, 2014). Both variables are adapted from Tinto’s (1975) integration model. The index for social integration includes student participation in (1) campus clubs, organizations, or groups, (2) campus drama performances or art, and (3) participation in sports. The index for academic integration includes the frequency with which students (1) met with advisors, (2) interacted informally with faculty, (3) interacted with faculty outside of class, and (4) participated in study groups. A number of studies further support the inclusion of such variables within student retention models.

Social Integration

Social engagement has been found to more significantly influence first-year outcomes related to persistence than academic integration (Flynn, 2014; Kuh, 2008). However, Flynn’s (2014) findings support the original assertions of Tinto (1975) which strongly posited that social and academic integration influence persistence. In addition, Flynn found that students who continue to exhibit such behaviors after the first year have higher degree attainment. Hu (2011) completed a study that analyzed the influence of social and academic integration on persistence.

In his study, he categorized persistence into three categories to include low, medium, and high social or academic integration. Consistent with Flynn's findings, Hu (2011) found that social integration had a more significant positive influence on persistence. Accordingly, Hu found that there was no significant influence on persistence for those who reported high and medium levels of academic engagement. Hu (2011) found that students who reported high levels of academic integration persisted at the rate of 80.7% while those who reported high levels of social engagement persisted at a level of 95.6%.

Academic Integration

In their study examining students' sense of belonging in college, Hurtado and Carter (1997) found that significant aspects of belonging occurred when students interacted frequently with their peers regarding class content. Within their third year, students who reported tutoring other students and interacting frequently with faculty outside of class reported elevated levels of belonging.

While Dwyer (2017) cites a lack of clarity in defining academic engagement, in her literature review focused on faculty and student relationships, Hoffman (2014) categorizes the literature related to faculty and student relationships in the following categories: (1) academic interactions, (2) out-of-class interactions, (3) casual or informal interactions, and (4) casual interactions through digital communication.

Dwyer (2017) completed an institutional mixed-methods study on faculty and student interaction. The quantitative findings were consistent with previously cited literature which found that students who reported high levels of satisfaction with faculty and student interactions reported a moderate increase in intention to persist. As there is a lack of qualitative data which examines student retention and persistence, Dwyer (2017) captured such data in his study. Respondents reported that kindness and the willingness to interact was motivating. Consistent

with Tinto's (1975) earlier findings, Dwyer also found that a lack of engagement with faculty may lead to student departure.

While there are many studies which measure faculty and student interaction, Hoffman (2014) posits that there is an additional need to focus on potentially negative effects of such interactions such as mutual questions of boundaries between faculty and students. While this point is not examined within this study, it is recommended as a factor for further consideration.

Feels Like Part of the Institution

Tinto (1993) argues that a student's commitment to an institution is positively related to their retention at that institution. It is found in the literature that when students feel like they are a part of the campus community, they are more likely to feel loyal towards their institution and persist (Bean, 2005). Berger and Braxton (1998) found that those students entering elite universities experience a higher level of commitment to their institutions based on both strong traditions and understood social agreements (social charters) of such universities which leads to more opportunities for elite areas of employment. Thomas (2002) also finds that the fit between the individual and the institution has a significant relationship to persistence.

Organizational Influences

Institutional Control

Literature related to institutional control suggests that institutional control is a significant factor in the study of student retention. After controlling for other factors, the literature also finds overwhelmingly that private institutions, particularly non-profit institutions, have higher retention rates for all students. In the study utilizing data from the 1995/1996 and 2000/2001 follow-up of the Beginning Postsecondary Survey by Kim (2007), it was found that institutional control was a significant predictor of first-year student retention, which is consistent with previous literature. However, in her 2012 study utilizing data from the Beginning Postsecondary

Survey (1996/2001) and the Integrated Postsecondary Education Data System (1995/2000) examining the impact of student level and institutional level variables on retention, Chen (2012) found that private and selective indicators were non-significant in her study after controlling for institutional demographic factors, student background characteristics, and financial and faculty resources. This finding substantiated the need for inclusion of institutional factors within student retention and persistence models while also supporting the need to further examine their relationship to retention by controlling for additional factors.

Institutional Selectivity

A number of studies have found that institutional selectivity is a significant factor in the study of student retention (Titus, 2006). A major national study conducted by Kim (2007) found that students at highly selective universities had a probability of degree completion that was about 10% higher than those from low selective institutions even when controlling for institutional and individual variables. Kim suggests that this finding may be attributed to the notion that students tend to persist at higher rates when there are more benefits to their college education. Kim posits that in general there are more benefits identified at more selective institutions, such as potentially higher salaries. Specifically, Kim found that students who attended highly selective institutions had a completion probability that was about 10% higher than those who attended the least selective institutions. Such findings are consistent with the earlier findings of Tinto (1993) that institutional selectivity was significant in models predicting student retention.

Institutional Size

The finding that institutional size is a significant variable in student persistence models is supported in the study by Titus (2004) which was based on a national sample utilizing the Beginning Postsecondary Survey. In his study, Titus found that chances of persistence were

increased by an average of 4% with a one standard deviation increase in institutional size. This and similar findings related to institutional size are consistent with earlier research which suggests that institutional factors including size are important for inclusion in persistence models (Bean, 1980; Kuh, 2008).

Summary and Critique of Prior Literature

The prior literature within this section was grouped into seven categories and was derived as a result of the various theories related to student retention and persistence, social and academic integration, and academic disciplines. Keeping in mind that the topic of retention and persistence studies is one of the most widely researched topics within the study of higher education, the literature is quite consistent in its guidance on the most appropriate variables to be included within models examining retention and persistence. One of the most glaring findings within the literature, however, is the realization that although there are so many studies related to the topic as well as many programs at institutions aimed at improving retention and persistence, within the past 40 years there has only been a very modest increase in retention and persistence rates within institutions.

The literature also reveals that there are a number of robust data sets which allow for the study of retention and persistence at the national level. In the case of the BPS survey, the items related to social and academic integration follow the primary theoretical framework guiding this study (Tinto, 1975). As such, the individual items, which are later indexed into composite variables, incorporate the primary constructs from Tinto's theory of integration. As Tinto's theory is one of the most widely used theories to guide the study of retention and persistence, the BPS survey's consistency with the theory allows for congruence when comparing study results to other literature.

Conceptual Model

Persistence and retention studies focused on academic discipline remain limited, although throughout the literature retention and persistence have consistently been found to have a significant relationship with academic discipline. Further, and based on Tinto's (1975) integration theory, the literature has a dearth of studies that examine the variance of social and academic integration by academic discipline. The goal of this study is to both examine the relationship between academic discipline and retention while also examining the variance of social and academic integration by academic discipline.

Based on the results of the reviews of both the theory and the literature, the conceptual model depicted within Figure 1 was constructed. The model depicts seven categories derived from the theory review with seven accompanying sets of independent variables which were also derived from the literature review. The dependent variable is first year retention.

Independent Variables

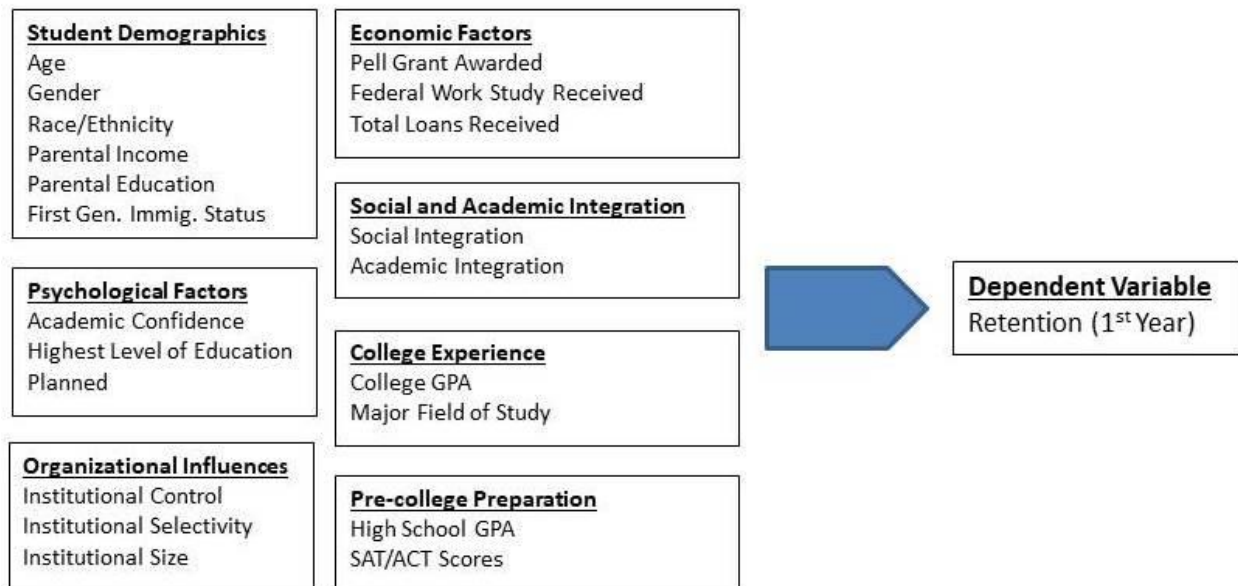


Figure 1. Conceptual Model

Chapter 3: Research Design

The purpose of this study was to add to the student retention literature an examination of student retention by academic discipline and through the lens of student integration. Within Chapter 2, the lack of data on student retention outcomes related to academic discipline was established while the additional focus on student integration was introduced. It has been established that there are significant differences in how students experience the college setting depending upon their academic discipline of choice. These differences have an impact on the very factors proven to be significantly related to retention outcomes among college students. The goal of this study was to initiate further scholarly interest in this neglected area of focus within the extant literature on student retention.

This chapter includes a restatement of the research questions, an explanation of the model upon which this study was based, a discussion of the data source and accompanying sample, and a discussion of the specific variables utilized. Further, this chapter includes a discussion of the research methods utilized along with an explanation of the analysis technique employed.

Research Questions

1. How is academic and social integration distributed across different disciplines?
2. Are student retention rates different between students from different academic disciplines?
3. In general, does academic and social integration relate to student retention?
4. Does the relationship between academic/social integration and student retention differ across different academic disciplines? If so, how?

Research Model

The conceptual framework guiding this study is based on the five major categories of theories reviewed within the previous chapter. Those categories include social, psychological,

economic, integration, and organizational. Based on the theories reviewed within those categories, the predictors for the model have been organized into eight groups which are visually represented in Figure 1. The dependent variable in the model is student retention at the end of the first year. The independent variables are organized into categories derived from the literature related to student retention. The categories and variables include the following:

- **Student demographics:** gender, race/ethnicity, age, socioeconomic status (parental income and parental education), first-generation immigration status
- **Psychological factors:** academic confidence, highest level of education planned
- **Pre-college preparation:** high school GPA, SAT/ACT scores
- **Economic factors:** Pell grant awarded, federal work study, total student loans
- **Social and academic integration:** social integration and academic integration
- **College experience:** college GPA, major field of study
- **Organizational influences:** institutional control, institutional selectivity, and institutional size

Data Source

The data source utilized for this study was the restricted data of the Beginning Postsecondary Student (BPS) survey initially administered in 2012. The BPS survey is designed to collect data on student persistence and completion of postsecondary programs. This includes data on their transition to employment, demographic information, changes in goals over time, income, debt, marital status, and a number of other indicators (NCES, 2018). The BPS is administered by the National Center for Education Statistics at three different points in time for its sample. This includes the end of the first year, three years after the beginning of postsecondary education, and six years after the beginning of education. The initial administration of the BPS survey was during 1990 and included students beginning

postsecondary education between July 1, 1989 and June 30, 1990 (Hahs-Vaughn, 2004). The BPS survey utilized cohorts from the larger National Postsecondary Student Aid Survey (NPSAS), both surveys being nationally representative samples. While the NPSAS focuses on practices related to payment for postsecondary education by college students and their families, the BPS survey focuses on retention and completion of postsecondary programs (Chen, 2008; Hill, Smith, Wilson, & Wine, 2016).

According to Hill, Smith, Wilson, and Wine (2016), the data for the BPS was collected utilizing two methods to include interviews and administrative databases. The interviews were conducted by telephone and/or web using identical questions. The administrative data was collected from a number of sources to which the students in the sample were matched, including the Central Processing System (information from the FAFSA), the National Student Loan Data System, the National Student Clearinghouse, and SAT and ACT data collected during the respondent's base year (2012/2014).

For a study focused on student retention and the subtopic of student integration, several other data sets could have been utilized but each had limitations. The Educational Longitudinal Survey (ELS) is a longitudinal survey that collects data from high school sophomores in its base year, and focuses on topics such as student learning, effects of high school factors on postsecondary education, and dropout predictors (NCES, 2018). For purposes of this study, the BPS is a more appropriate tool than ELS due to its inclusion of the composite variable focused on social and academic integration and its robust integration of financial data. The National Survey for Student Engagement (NSSE) would have been ideal for examining the constructs related to student integration; however, it does not include an actual retention measure and financial information for college attendance is not as comprehensive as in BPS.

The BPS survey has limitations related to the three points at which it collects data. The main limitation identified within previous studies has been that data for some key variables is not collected during each administration of the survey (Chen, 2009; Kim, 2007). Importantly identified by Chen (2009), data on students who may have selected a particular major between data collection points is not collected. This limitation was mitigated, as the data within this study was derived from the 2012/2014 administration of the BPS.

Sample

The most recent administration for which data is available is the 2012/2014 administration of the survey which includes a sample size of more than 37,000. This study focused on students who began in four-year institutions in 2012. As such, the first administration within the 2012 BPS survey was used to derive the sample. The sample size after removal of non-four-year institutions, non-degree granting institutions, and special focus institutions was 10,716. After then removing missing cases, whole group sample size included 8,453 cases which represents 79% of the total four-year student population of the survey. The largest subgroup samples were the social subgroup (n=2,948) and the investigative subgroup (n=2,266). The artistic subgroup (n=1,436) and enterprising subgroups (n=1,300) were the smaller of the four subgroup samples.

Variables

Dependent Variable

This study utilized a dichotomous outcome variable from the BPS survey which indicates whether or not a student was retained at their entering institution after their first year of attendance. Many services aimed at integrating students into the college environment are provided for students within their first year and the literature has indicated the importance of such programming and interventions (Evans, Forney, Guido, Patton, & Renn, 2010; Habley et

al., 2012; Seidman, 2012). With nearly 19% of full time students at four-year colleges not being retained after their first year, examining retention after the first year is an important point in time for analysis (Ginder, Kelly-Reid, & Mann, 2017). The focus of this study was to understand whether the relationship between integration and retention differs by academic discipline.

Analysis

The analysis began with data cleaning and management. The categorical variables were recoded into dummy variables in preparation for the analysis. The continuous variables related to financial factors (total income, Pell amount, federal work study, and total loans) were log-transformed for the analysis to reduce the effects of a positively skewed distribution (Tabachnick & Fidell, 2007). Missing data was removed utilizing case-wise deletion, and separate data sets were created for each subgroup in preparation for completing the descriptive analysis and the logistic regressions. As the use of weight is sometimes necessary to give some underrepresented types of students more weight than others (Allison, 1999), the appropriate weight variable was included in the model.

A descriptive analysis was completed to better understand the sample and to answer the first two research questions. According to Pallant (2010), further uses of the descriptive data include describing the characteristics of the sample and checking variables for any inconsistencies in assumptions that may complicate the statistical techniques chosen. As a result of the descriptive analysis, the strongly disagree and disagree variables were combined and coded as disagree due to low percentages.

Logistic regression, also known as logit analysis, is a widely used regression method for dichotomous dependent variables (Allison, 1999). In cases in which the dependent variable is categorical, it would not be suitable to utilize multiple regression considering the linear nature of

the variable (Pallant, 2010). As the outcome variable of this study is a dichotomous categorical variable, binomial logistic regression was utilized for analyzing the model.

Subgroup Analysis

Holland's (1966) theory of academic disciplines describes six distinct personality types with six comparable academic environments. The conventional and realistic academic environments described by Holland contain academic disciplines that are largely not represented in four-year postsecondary educational environments. Some disciplines included in these categories include agricultural inspection, carpentry, machine setting and operation, various trades, and bus and truck mechanics. This finding is supported by Smart and Umbach (2007) within their study examining faculty and academic environments. In their study, both the conventional and realistic academic environments were removed based on such low sample sizes. With this study, those cases were coded into an "other majors" subgroup. Accordingly, the four subgroups of focus within this study were investigative, artistic, social, and enterprising.

Limitations

A general limitation to the use of secondary data is that the data collected is the only data available for use in the studies utilizing that particular data set. Use of secondary data does not allow for the researcher to customize items to better fit the needs of their study. There were a small number of variables suggested by the literature to be important in the study of student retention which were not available within the BPS data set. Such variables include academic self-discipline, sense of importance or mattering (both psychological factors), commitment to college, research opportunities, and additional factors measuring academic and social integration (college experience). Although these variables were not included in the BPS data set, there were related variables within the broader categories that served as sufficient proxies for the more direct variables identified within the literature.

Another limitation to this study was that it utilized the six personality types from Holland's theory to group the various academic disciplines. While this approach adds to the literature on the topic of retention, it does not answer the question of the relationship between the individual academic discipline and retention through the lens of social and academic integration. More research would need to be conducted to adequately answer that question.

Finally, the literature overwhelmingly indicates that the magnitude of various predictors for retention change over the course of time. As this study focused on first-year retention only, it did not examine the effects of the various results throughout the different aspects of the lifecycle for students. It would be beneficial for future research to address how the findings of this study may change over the course of matriculation for the student.

Chapter 4: Results

Introduction

The purpose of this study was to examine the relationship between student retention and both social and academic engagement. Further, this study aimed to determine how social and academic integration varies by academic discipline category. The data used for this national study was derived from the Beginning Postsecondary Study which is administered by the National Center for Education Statistics and included cohorts of first-time students at several points in time. The results are presented within two sections of this chapter. Prior to developing the descriptive statistics and completing the regression analyses, data management was completed which included cleaning the data, organization of the variables, and removal of cases with missing data.

The first section of this chapter includes the descriptive statistics for all of the variables presented. This section includes percentages, means, and standard deviations for categorical and continuous variables. These results are presented in tables which include cross-tabulations.

The second section presents the results of five regression models for student retention which include the whole group and four subgroups of academic discipline categories. Logistic regression was used for the whole group and subgroup analyses. Included in this section are the results presented in tables.

Finally, the results presented within this chapter aim to answer the following research questions which guided this study:

1. How is academic and social integration distributed across different disciplines?
2. Are student retention rates different between students from different academic disciplines?
3. In general, does academic and social integration relate to student retention?

4. Does the relationship between academic/social integration and student retention differ significantly across different academic disciplines? If so, how?

Descriptive Statistics

Table 1 describes the dependent variable, retention outcomes, and sample size for the whole group and the subgroups which were categorized by academic discipline types.

Categorical Variables

Dependent Variable and Sample Size. The artistic subgroup contained 1,436 cases while the enterprising subgroup contained 1,300 cases. As indicated in the previous chapter, the subgroup which included other majors was not a focus of the regression analysis. However, it was important that it be included in the descriptive analysis; this subgroup included 484 cases.

Also described within Table 1, the retention rate between the whole group and the various subgroups showed a variance. The whole group retention was 71%, which was the same as that of the social subgroup. Both the investigative and artistic subgroups had retention rates of 73%, which were two percentage points above that of the whole group. Overall retention rates for the enterprising subgroup (68%) and the other majors subgroup (69%) were lower by 3 and 2 percentage points, respectively.

Table 1

Whole Group, Subgroup Sample Size and Retention Rate

Major Category	Sample Size	% of Whole Group	Retention
Whole Group	8,453	n/a	71%
Investigative Subgroup	2,266	27%	73%
Artistic Subgroup	1,436	17%	73%
Social Subgroup	2,948	35%	71%
Enterprising Subgroup	1,300	15%	68%

Major Category	Sample Size	% of Whole Group	Retention
Other Majors Subgroup	484	6%	69%

As described within Tables 2 and 3, the distribution of gender varied significantly between the whole group and the subgroups. The whole group had a female percentage of 58%, while the artistic subgroup (64% female) and social subgroup (74% female) had more females. The remaining subgroups had a lower percentage of female students compared to the whole group; remaining subgroups included the other majors subgroup at 54%, enterprising at 51%, and investigative at 40%.

There was less variance in race and ethnicity across subgroups. The whole group included 61% White students, with three of the subgroups comprised of higher percentages including artistic (66%), other majors (65%), and social (62%). The subgroups which showed a smaller number of White students included enterprising (60%) and investigative (55%). The next highest percentage race was Hispanic, with the largest variance being between the investigative subgroup (17%) and the other majors subgroup (12%). The subgroup that had the smallest number of cases among the whole group and all subgroups was Asians at 6% for the whole group and enterprising subgroup. Asians represented 9% of the investigative group, 8% of other majors, 5% of artistic, and 4% of the social subgroup. Black students had the highest representation within the enterprising subgroup (15%), while representing 14% of the social subgroup, 12% of the investigative subgroup, 10% of the artistic subgroup, 11% of other majors, and 13% of the whole group.

Social and Academic Integration. The highest representation within Tables 2 and 3 appears within the variable indicating agreement with academic confidence, with 88% of the sample within the whole group, investigative, enterprising, and other majors subgroups. Within

the social subgroup, 90% of the sample indicated having agreement with academic confidence, while 87% of the artistic subgroup indicated agreement with academic confidence.

Included within the descriptive statistics are variables indicating students' levels of satisfaction with the social and academic experience. For both categories there were four options represented: disagree/strongly disagree, neutral, agree, and strongly agree. It is important to note that the categories for strongly disagree and disagree were combined for the social and academic integration variables. In considering satisfaction with social engagement, the highest rated option selected by the sample was strongly agree, which was represented by 45% of the whole group and investigative subgroup, 46% of the social and enterprising subgroups, 43% of other majors, and a lower representation of 39% of the artistic subgroup. Similarly, the highest rated option for academic integration was strongly agree, which was represented by 46% of the social subgroup, 44% of the whole group, and 43% of the investigative, artistic, and enterprising subgroups. The other majors subgroup fell slightly below the other subgroups, with an indication of 41% strong satisfaction with their academic experience.

Across social and academic integration categories, the lowest rated category was the disagree category, indicating that a much larger percentage of students were satisfied with their level of social and academic integration. Those indicating the highest level of disagreement with satisfaction with social integration (14%) were those within the artistic major subgroup. Thirteen percent of those within the whole group and the enterprising subgroup indicated disagreement with satisfaction with social integration, while 12% of those within the investigative, social, and other majors subgroups indicated such disagreement.

Tables 2 and 3 describe the categorical independent variables within the whole group and subgroups.

Table 2

Whole Group Categorical Variables

Variable	Whole Group (N=8,453)
Female	58%
White	61%
African American	13%
Hispanic	15%
Asian	6%
Other Races	5%
Parent Ed. Below Bach/Unknown	47%
Parent Ed. Bachelors	26%
Parent Ed. Above Bach	27%
First-Generation Immigration Status	12%
Acad. Conf.: Ability to Succeed Agree	88%
Acad. Conf.: Ability to Succeed Disagree/Neutral	12%
Student Highest Level of Educ. Exp. Below BA	9%
Student Highest Level of Educ. Exp. BA	34%
Student Highest Level of Educ. Exp. Above BA	57%
Low HS GPA	14%
Moderate HS GPA	12%
High HS GPA	41%
Highest HS GPA	33%
Satisfaction with Social Eng. Disagree	13%
Satisfaction with Social Eng. Neutral	12%
Satisfaction with Social Eng. Agree	31%
Satisfaction with Social Eng. Strongly Agree	45%
Satisfaction with Acad. Eng. Disagree	9%
Satisfaction with Acad. Eng. Neutral	10%

Variable	Whole Group (N=8,453)
Satisfaction with Acad. Eng. Agree	37%
Satisfaction with Acad. Eng. Strongly Agree	44%
Institutional Control: Public	42%
Institutional Control: Private	58%
Institutional Selectivity: Min Selective	26%
Institutional Selectivity: Mod Selective	43%
Institutional Selectivity: Very Selective	32%
Institutional Size: Small	27%
Institutional Size: Medium	33%
Institutional Size: Large	40%
Investigative	27%
Artistic	17%
Social	35%
Enterprising	15%
Other Majors	6%

Table 3

Subgroup Group Categorical Variables

Variable	Investigative	Artistic	Social	Enterprising	Other Majors
	(N=2,266)	(N=1,436)	(N=2,948)	(N=1,300)	(N=484)
Female	40%	64%	74%	51%	54%
White	55%	66%	62%	60%	65%
African American	12%	10%	14%	15%	11%
Hispanic	17%	13%	15%	15%	12%
Asian	9%	5%	4%	6%	8%
Other Races	6%	5%	5%	4%	5%

Variable	Investigative	Artistic	Social	Enterprising	Other Majors
Parent Ed. Below Bach/Unknown	46%	37%	51%	49%	40%
Parent Ed. Bachelors	25%	30%	25%	25%	26%
Parent Ed. Above Bach	29%	33%	23%	25%	33%
First-Generation Immigration Status	16%	11%	9%	13%	12%
Acad. Conf.: Ability to Succeed Agree	88%	87%	90%	88%	88%
Acad. Conf.: Ability to Succeed Disagree/Neutral	12%	13%	10%	12%	12%
Student Highest Level of Educ. Exp. Below BA	8%	6%	10%	11%	6%
Student Highest Level of Educ. Exp. BA	34%	44%	27%	38%	35%
Student Highest Level of Educ. Exp. Above BA	58%	50%	62%	51%	59%
Low HS GPA	14%	12%	14%	16%	12%
Moderate HS GPA	11%	13%	13%	15%	11%
High HS GPA	38%	43%	43%	41%	39%
Highest HS GPA	38%	33%	31%	28%	38%
Satisfaction with Social Eng. Disagree	12%	14%	12%	13%	12%
Satisfaction with Social Eng. Neutral	12%	14%	11%	13%	14%
Satisfaction with Social Eng. Agree	30%	33%	31%	28%	32%
Satisfaction with Social Eng. Strongly Agree	45%	39%	46%	46%	43%

Variable	Investigative	Artistic	Social	Enterprising	Other Majors
Satisfaction with Acad. Eng. Disagree	9%	9%	9%	9%	10%
Satisfaction with Acad. Eng. Neutral	11%	11%	8%	10%	10%
Satisfaction with Acad. Eng. Agree	36%	37%	37%	38%	39%
Satisfaction with Acad. Eng. Strongly Agree	43%	43%	46%	43%	41%
Institutional Control: Public	41%	42%	44%	39%	38%
Institutional Control: Private	59%	58%	56%	61%	62%
Institutional Selectivity: Min Selective	29%	16%	26%	33%	16%
Institutional Selectivity: Mod Selective	37%	44%	49%	39%	37%
Institutional Selectivity: Very Selective	33%	40%	26%	28%	47%
Institutional Size: Small	27%	24%	30%	25%	31%
Institutional Size: Medium	31%	35%	36%	31%	28%
Institutional Size: Large	42%	41%	35%	44%	41%

Continuous Variables (Tables 4-8)

The mean age of the whole group was 18 years, which was the same across all subgroups.

In the GPA category, there was variance across each of the academic major category groups.

The group with the highest mean GPA was the artistic group, with a mean GPA of 3.07. The

mean GPA for the remaining groups included the whole group at 2.97, investigative at 2.92, social at 2.99, enterprising at 2.94, and other majors at 2.92 (which was the lowest). Although lowest in other categories, the other majors subgroup had the highest SAT score with a mean score of 1115, followed by the investigative subgroup with a mean SAT score of 1092.

There was variance within the financial variables across the academic major groups. The subgroup with the lowest total income was the social subgroup, with a mean total income of \$80,972. The subgroup with the highest total income was the subgroup representing other majors at \$103,763. The investigative subgroup has a mean total income of \$86,986, the enterprising subgroup had a mean total income of \$89,457, and the artistic subgroup had a mean total income of \$95,905, representing the second highest mean total income.

Pell amount varied significantly across the major groupings. The whole group Pell mean was \$1,745, while the Pell mean for the other majors subgroup was \$1,348 (which represented the lowest Pell amount). The investigative subgroup had a mean Pell amount of \$1,816 while the artistic subgroup had a mean Pell amount of \$1,453, the social subgroup had a mean Pell amount of \$1,887, and the enterprising subgroup had a mean Pell amount of \$1,743 (which was almost equivalent to that of the whole group).

Tables 4, 5, 6, 7, 8, and 9 describe the continuous variables within the models.

Table 4

Whole Group Continuous Variables

Whole Group (N=8,453)				
Variable	Mean	SD	Mean (logged)	SD (logged)
Age	18.672	1.549		
Total Income/\$1000	87.271	86.488	10.509	2.456
SAT Score	1056.922	203.784		
Pell Amount/\$1000	1.745	2.305	3.463	4.065
Total Federal Work Study/\$1000	0.340	0.86	1.312	2.834
Total Loans/\$1000	4.878	4.811	6.003	4.072
College GPA	297.647	80.213		

Table 5

Investigative Subgroup Continuous Variables

Investigative Subgroup (N=2,266)				
Variable	Mean	SD	Mean (logged)	SD (logged)
Age	18.703	1.625		
Total Income/\$1000	86.986	90.738	10.450	2.540
SAT Score	1092.193	217.085		
Pell Amount/\$1000	1.816	2.337	3.560	4.089
Total Federal Work Study/\$1000	0.326	0.860	1.211	2.757
Total Loans/\$1000	4.952	4.876	5.959	4.104
College GPA	292.448	83.328		

Table 6

Artistic Subgroup Continuous Variables

Artistic Subgroup (N=1,436)				
Variable	Mean	SD	Mean (logged)	SD (logged)
Age	18.406	0.880		
Total Income/\$1000	95.905	86.442	10.785	2.113
SAT Score	1090.068	197.427		
Pell Amount/\$1000	1.453	2.202	2.985	3.952
Total Federal Work Study/\$1000	0.381	0.919	1.374	2.874
Total Loans/\$1000	4.402	4.705	5.870	4.102
College GPA	303.584	78.471		

Table 7

Social Subgroup Continuous Variables

Social Subgroup (N=2,948)				
Variable	Mean	SD	Mean (logged)	SD (logged)
Age	18.683	1.547		
Total Income/\$1000	80.972	76.450	10.422	2.501
SAT Score	1020.254	189.807		
Pell Amount/\$1000	1.887	2.342	3.754	4.099
Total Federal Work Study/\$1000	0.345	0.838	1.382	2.883
Total Loans/\$1000	5.200	4.797	6.342	3.933
College GPA	299.220	77.140		

Table 8

Enterprising Subgroup Continuous Variables

Enterprising Subgroup (N=1,300)				
Variable	Mean	SD	Mean (logged)	SD (logged)
Age	18.991	2.050		
Total Income/\$1000	89.457	98.868	10.403	2.577
SAT Score	1030.054	202.045		
Pell Amount/\$1000	1.743	2.276	3.498	4.071
Total Federal Work Study/\$1000	0.293	0.821	1.097	2.648
Total Loans/\$1000	4.760	4.829	5.892	4.105
College GPA	294.002	83.524		

Table 9

Subgroup Continuous Variables

Other Majors Subgroup (N=484)				
Variable	Mean	SD	Mean (logged)	SD (logged)
Age	18.363	0.668		
Total Income/\$1000	103763.600	100712.500	10.785	2.310
SAT Score	1115.269	208.190		
Pell Amount/\$1000	1348.924	2174.347	2.644	3.853
Total Federal Work Study/\$1000	474.206	980.855	1.768	3.186
Total Loans/\$1000	4.965	4.295	4.965	4.295
College GPA	2.924	80.890		

Logistic Regression Results

Retention, a binary categorical variable within the whole group and the subgroups, was predicted using logistic regression. Five logistic regressions were completed including one for the whole group and one for each subgroup. The results of the regression are presented in Tables 10-14. The tables include odds ratios, standard error, and statistical significance. The results of the variables with significance are presented according to their category identified within the conceptual model guiding this study.

Whole Group Logistic Regression for Retention (Table 10)

Student Demographic Factors. The factors representing student demographics in the model include age, gender, race/ethnicity, parental income, parental education, and first-generation immigrant status. As described within Table 10, age was a significant predictor within the model; each additional year in age predicted 7% lower odds of retention ($OR=0.93$, $p<.05$). Total income was a significant predictor within the whole group model; a one-unit increase in total income predicted an 8% increase in retention ($OR=1.08$, $p<.01$). First-generation immigrant status was a significant predictor within the model; the odds of retention for first-generation immigrant students was 38% higher compared to those who were not first-generation immigrant students ($OR=1.38$, $p<.01$).

Psychological Factors. The psychological factors in the model included academic confidence and highest level of education planned. Students who expected a bachelor's level of education had 4.9 times the odds of retention into the second year compared to those who expected less than a bachelor's level of education ($OR=4.89$, $p<.001$). Likewise, those who expected more than a bachelor's level of education had 7.8 times the odds of retention compared to those who expected less than a bachelor's level of education ($OR=7.81$, $p<.001$).

Economic Factors. Economic factors within the model included amount of Pell grant awarded, federal work study received, and total loans received; Pell award amount and total loans were significant in the model. As described in Table 10, a one-unit increase in total federal work study awarded indicated a 3% increase in odds of retention (OR=1.03, $p<.01$). With regard to total loans, a one-unit increase in total loans represented a 2% increase in odds of retention (OR=1.02, $p<.001$).

Social and Academic Integration. Most factors related to social and academic integration were significant within the model. In comparison to those who indicated disagreement with satisfaction with social engagement, the odds of those who indicated agreement were 78% higher (OR=1.78, $p<.001$) and the odds for those who strongly agreed that they were satisfied with their social integration were 93% higher (OR=1.93, $p<.001$).

As indicated within Table 10, those who indicated neutral satisfaction with academic engagement had 49% higher odds of retention compared to those who indicated disagreement with satisfaction with their academic experience (OR=1.49, $p<.01$). The odds of retention for those who indicated agreement with their level of satisfaction with their academic experience were 85% higher than that of those who indicated disagreement (OR=1.85, $p<.001$). Likewise, students who indicated strong agreement with their level of satisfaction with academic integration had odds for retention 2.03 times those who indicated disagreement with their level of satisfaction with their academic experience (OR=2.03, $p<.001$).

Institutional Factors. The variables related to institutional factors in the model were institutional control, institutional selectivity, and institutional size. Moderately selective institutions had 32% higher odds of student retention (OR=1.32, $p<.01$) when compared to low selective institutions. Very selective institutions had 36% higher odds of retention when

compared to low selective institutions (OR=1.36, $p<.001$). Similarly, large institutions had 54% higher odds of retaining students than small institutions (OR=1.54, $p<.05$).

Table 10

Whole Group Logistic Regression, Dependent Variable: Retention

Retention	Odds Ratio	Standard Error	Significance
Female	0.964	0.082	
African American	0.837	0.118	
Hispanic	1.086	0.143	
Asian	1.150	0.230	
Other Races	1.357	0.232	
Age	0.923	0.037	*
Total Income (log)	1.084	0.030	**
Parent Ed. Bach	1.217	0.122	
Parent Ed. Above Bach	1.195	0.126	
First-Generation Immigration Status	1.381	0.213	**
Acad. Confidence: Ability to Succeed Agree	1.157	0.152	
Student Highest Level of Educ. Exp. BA	4.899	0.814	***
Student Highest Level of Educ. Exp. Above BA	7.810	1.309	***
Moderate HS GPA	0.891	0.148	
High HS GPA	1.180	0.165	
Highest HS GPA	1.401	0.231	*
SAT Score	1.001	0.000	**
Pell Amount (log)	1.001	0.012	
Total Federal Work Study (log)	1.037	0.014	**
Total Loans (log)	1.021	0.010	*
Satisfaction with Social Eng. Neutral	1.187	0.172	
Satisfaction with Social Eng. Agree	1.781	0.216	***

Retention	Odds Ratio	Standard Error	Significance
Satisfaction with Social Eng. Strongly Agree	1.932	0.243	***
Satisfaction with Acad. Eng. Neutral	1.497	0.247	**
Satisfaction with Acad. Eng. Agree	1.853	0.259	***
Satisfaction with Acad. Eng. Strongly Agree	2.030	0.302	***
College GPA	1.658	0.097	***
Investigative	1.198	0.130	
Artistic	1.151	0.149	
Enterprising	1.255	0.148	
Other Majors	0.896	0.161	
Institutional Control: Public	1.149	0.122	
Institutional Selectivity: Mod Selective	1.320	0.157	**
Institutional Selectivity: Very Selective	1.360	0.203	**
Institutional Size: Medium	1.263	0.142	
Institutional Size: Large	1.540	0.195	**
Note: Significance: ***p<.001; **p<0.01; *p<.05			

Investigative Subgroup Logistic Regression for Retention (Table 11)

The variables which showed significance in this model were from the conceptual model categories for psychological factors, social and academic integration, college experience, and institutional factors.

Student Demographics. The variable relative to student demographics that was significant within this model included gender. Specifically, the odds of female students being retained was 34% lower than the odds for male students (OR=0.66, $p<.05$).

Psychological Factors. The variables representing student's academic confidence and student's highest level of education expected were significant in this model. Accordingly, the odds of students who indicated agreement with their confidence in succeeding were 46% lower

than the odds of being retained when compared to those who did not agree (OR=0.54, $p<.05$). However, students who expected a bachelor's level of education had 7.1 times the odds of retention (OR=7.17, $p<.001$) compared to those who expected less than a bachelor's level of education. Similarly, the odds of retention for those who expected more than a bachelor's level of education were 14.18 times the odds of those who expected less a bachelor's level of education (OR=14.18, $p<.001$).

Social and Academic Integration. For the investigative subgroup, none of the factors related to social integration were significant in the model; however, all of the factors related to academic integration were significant. As indicated within Table 11, those who indicated neutral satisfaction with academic engagement had 1.91 times the odds of retention compared to those who indicated disagreement with satisfaction with their academic experience (OR=1.91, $p<.05$). The odds of retention for those who indicated agreement with their level of satisfaction with their academic experience were 2.74 times that of those who indicated disagreement (OR=2.74, $p<.001$). Likewise, students who indicated strong agreement with their level of satisfaction with academic integration had odds for retention that were 2.70 times those who indicated disagreement with their level of satisfaction with their academic experience (OR=2.70, $p<.01$).

College Experience. Within the college experiences category, college GPA was found to be a significant predictor of retention. For each one point increase in college GPA, the odds of retention were 96% higher (OR=1.96, $p<.001$).

Institutional Factors. Within this subgroup, institutional control was positively related to student retention. Specifically, those who attend a public institution have 53% higher odds of retention compared to those who attend private institutions (OR=1.53, $p<.01$).

Table 11

Investigative Subgroup Logistic Regression, Dependent Variable: Retention

Retention	Odds Ratio	Standard Error	Significance
Female	0.663	0.108	*
African American	0.811	0.214	
Hispanic	1.244	0.321	
Asian	1.372	0.438	
Other Races	1.925	0.653	
Age	1.051	0.059	
Total Income (log)	1.119	0.045	**
Parent Ed. Bach	1.543	0.297	*
Parent Ed. Above Bach	1.588	0.339	*
First-Generation Immigration Status	1.325	0.367	
Acad. Confidence: Ability to Succeed Agree	0.542	0.132	*
Student Highest Level of Educ. Exp. BA	7.177	2.201	***
Student Highest Level of Educ. Exp. Above BA	14.187	4.546	***
Moderate HS GPA	0.616	0.194	
High HS GPA	0.981	0.256	
Highest HS GPA	1.185	0.351	
SAT Score	1.000	0.000	
Pell Amount (log)	1.037	0.025	
Total Federal Work Study (log)	1.016	0.028	
Total Loans (log)	1.016	0.020	
Satisfaction with Social Eng. Neutral	0.895	0.256	
Satisfaction with Social Eng. Agree	1.552	0.379	
Satisfaction with Social Eng. Strongly Agree	1.597	0.400	
Satisfaction with Acad. Eng. Neutral	1.913	0.568	*
Satisfaction with Acad. Eng. Agree	2.743	0.778	***

Retention	Odds Ratio	Standard Error	Significance
Satisfaction with Acad. Eng. Strongly Agree	2.702	0.815	**
College GPA	1.963	0.224	***
Institutional Control: Public	1.539	0.304	*
Institutional Selectivity: Mod Selective	1.346	0.280	
Institutional Selectivity: Very Selective	1.251	0.312	
Institutional Size: Medium	1.122	0.241	
Institutional Size: Large	1.560	0.389	
Note: Significance: *** $p < .001$; ** $p < 0.01$; * $p < .05$			

Artistic Subgroup Logistic Regression for Retention (Table 12)

The variables which showed significance in this model were from the conceptual model categories for psychological factors, pre-college preparation, economic factors, social and academic integration, and college experience.

Student Demographic Factors. The significant predictor within the artistic major subgroup model across student demographic factors was the variable for parental education. The odds of student retention when their parents attained a bachelor's degree were 82% higher than the odds for a student whose parents achieved less than a bachelor's degree ($OR=1.82$, $p < .05$). Similarly, the odds of student retention when their parents attained more than a bachelor's degree were 60% higher than for a student whose parents attained a bachelor's degree or less ($OR=1.60$, $p < .05$).

Psychological Factors. The variables representing student's highest level of education expected were significant in this model. Accordingly, students who expected a bachelor's level of education had 5.4 times the odds of retention ($OR=5.40$, $p < .001$) compared to those who expected less than a bachelor's level of education. Similarly, the odds of retention for those who

expected more than a bachelor's level of education were 9.02 times higher compared to those who expected less than a bachelor's level of education (OR=9.02, $p<.001$).

Economic Factors. A one unit increase in total loans represented a 5% increase in odds for retention (OR=1.05, $p<.001$). This result is consistent with the findings of such studies as Dixon's (2018), who found that an increase in total loans was positively associated with persistence. Although a number of studies have not found this to be the case, in a national study on the effects of loans on degree attainment, it was found that the relationship between total loans and retention varied by subgroup (Kim, 2007).

Social and Academic Integration. While two factors related to social integration were significant within this model, none of the factors related to academic integration were significant. In comparison to those who indicated disagreement with satisfaction with social engagement, the odds of those who indicated agreement were 3.27 times higher (OR=3.27, $p<.001$) and the odds for those who strongly agreed that they were satisfied with their level of social integration were 2.55 higher (OR=2.55, $p<.01$).

College Experience. Within the college experiences category, college GPA was found to be a significant predictor of retention within the artistic major subgroup. For each unit increase in college GPA, the odds of retention were 1.35 times higher (OR=1.35, $p<.05$). Although a significant predictor of retention, the impact of college GPA on student retention within this subgroup fell well below the findings for the whole group and the other subgroups within the model. This finding is also inconsistent with other studies such as Chen and St. John's (2011), who found that college GPA led to a 93% increase in the odds of retention compared to those who dropped out.

Table 12

Artistic Subgroup Logistic Regression, Dependent Variable: Retention

Retention	Odds Ratio	Standard Error	Significance
Female	0.998	0.196	
African American	0.955	0.404	
Hispanic	1.410	0.456	
Asian	1.081	0.451	
Other Races	1.411	0.712	
Age	0.809	0.108	
Total Income (log)	0.935	0.041	
Parent Ed. Bach	1.824	0.428	*
Parent Ed. Above Bach	1.607	0.379	*
First-Generation Immigration Status	1.126	0.392	
Acad. Confidence: Ability to Succeed Agree	1.414	0.398	
Student Highest Level of Educ. Exp. BA	5.409	2.234	***
Student Highest Level of Educ. Exp. Above BA	9.027	3.898	***
Moderate HS GPA	1.894	0.646	
High HS GPA	1.937	0.643	
Highest HS GPA	1.781	0.665	
SAT Score	1.001	0.001	
Pell Amount (log)	0.963	0.028	
Total Federal Work Study (log)	1.026	0.035	
Total Loans (log)	1.054	0.024	*
Satisfaction with Social Eng. Neutral	1.275	0.396	
Satisfaction with Social Eng. Agree	3.277	0.872	***
Satisfaction with Social Eng. Strongly Agree	2.552	0.732	**
Satisfaction with Acad. Eng. Neutral	1.294	0.470	
Satisfaction with Acad. Eng. Agree	1.569	0.522	

Retention	Odds Ratio	Standard Error	Significance
Satisfaction with Acad. Eng. Strongly Agree	1.399	0.483	
College GPA	1.354	0.194	*
Institutional Control: Public	1.139	0.272	
Institutional Selectivity: Mod Selective	1.496	0.419	
Institutional Selectivity: Very Selective	1.501	0.508	
Institutional Size: Medium	1.285	0.380	
Institutional Size: Large	1.342	0.427	
Note: Significance: *** $p < .001$; ** $p < 0.01$; * $p < .05$			

Social Subgroup Logistic Regression for Retention (Table 13)

The variables which showed significance in this model were from the conceptual model categories for student demographics, psychological factors, pre-college preparation, social and academic integration, and college experience.

Psychological Factors. Variables representing students who were academically confident and student's highest level of education were significant in this model. Those who were confident in their ability to succeed had 59% higher odds of retention into the second year compared to those who disagreed or were neutral on academic confidence (OR=1.59, $p < .05$). Accordingly, students who expected a bachelor's level of education had 4.99 times the odds of retention (OR=4.99, $p < .001$) compared to those who expected less than a bachelor's level of education. Similarly, the odds of retention for those who expected more than a bachelor's level of education were 8.06 times higher compared to those who expected less than a bachelor's level of education (OR=8.06, $p < .001$).

Pre-college Factors. Within the artistic major subgroup, SAT score was a significant predictor of retention. For every 100 points of increase in SAT score, the odds of retention increased by one point (OR=1.001, $p < .05$).

Social and Academic Integration. Factors related to social and academic integration all were significant within the model. In comparison to those who indicated disagreement with satisfaction with social engagement, the odds of those who indicated agreement were 69% higher (OR=1.69, $p<.05$) and the odds for those who strongly agreed that they were satisfied with their social integration were 77% higher (OR=1.77, $p<.05$). Students who indicated strong agreement with their level of satisfaction with academic integration had odds of retention 76% higher than the odds for those who indicated disagreement with their level of satisfaction with their academic experience (OR=1.76, $p<.05$).

College Experience. Within the college experience category, college GPA was found to be a significant predictor of retention within the artistic major subgroup. For each point of increase in college GPA, the odds of retention were 2 times higher (OR=2.00, $p<.001$).

Institutional Factors. The variables related to institutional factors that had significance in this model were institutional selectivity and institution size. According to Table 13, moderately selective institutions had 47% higher odds of retaining students compared to low selective institutions (OR=1.47, $p<.05$). Very selective institutions had 67% higher odds of student retention within the social major subgroup (OR=1.67, $p<.05$) compared to low selective institutions. Large institutions had 68% higher odds of retaining students than small institutions (OR=1.68, $p<.05$).

Table 13

Social Subgroup Logistic Regression, Dependent Variable: Retention

Retention	Odds Ratio	Standard Error	Significance
Female	1.013	0.144	
African American	0.982	0.192	
Hispanic	0.999	0.197	

Retention	Odds Ratio	Standard Error	Significance
Asian	1.265	0.555	
Other Races	0.979	0.267	
Age	0.901	0.059	
Total Income (log)	1.051	0.032	
Parent Ed. Bach	0.801	0.128	
Parent Ed. Above Bach	0.746	0.126	
First-Generation Immigration Status	1.098	0.285	
Acad. Confidence: Ability to Succeed Agree	1.595	0.364	*
Student Highest Level of Educ. Exp. BA	4.992	1.363	***
Student Highest Level of Educ. Exp. Above BA	8.060	2.156	***
Moderate HS GPA	0.704	0.159	
High HS GPA	0.761	0.154	
Highest HS GPA	0.910	0.218	
SAT Score	1.001	0.000	*
Pell Amount (log)	0.971	0.018	
Total Federal Work Study (log)	1.033	0.022	
Total Loans (log)	0.999	0.017	
Satisfaction with Social Eng. Neutral	1.306	0.370	
Satisfaction with Social Eng. Agree	1.690	0.377	*
Satisfaction with Social Eng. Strongly Agree	1.779	0.402	*
Satisfaction with Acad. Eng. Neutral	1.517	0.461	
Satisfaction with Acad. Eng. Agree	1.430	0.337	
Satisfaction with Acad. Eng. Strongly Agree	1.766	0.435	*
College GPA	2.001	0.184	***
Institutional Control: Public	1.075	0.181	
Institutional Selectivity: Mod Selective	1.475	0.263	*
Institutional Selectivity: Very Selective	1.674	0.394	*

Retention	Odds Ratio	Standard Error	Significance
Institutional Size: Medium	1.356	0.226	
Institutional Size: Large	1.681	0.340	*

Note: Significance: *** $p < .001$; ** $p < 0.01$; * $p < .05$

Enterprising Subgroup Logistic Regression for Retention (Table 14)

The variables which showed significance in this model were from the conceptual model categories for student demographics, psychological factors, pre-college preparation, economic factors, social and academic integration, college experience, and institutional factors.

Student Demographic Factors. The significant predictors within the enterprising major subgroup model across student demographic factors were variables related to race and first-generation immigration status. The odds of retention for Black students was 46% less than that of White students ($OR=0.54$, $p < .05$). However, the odds of retention for students from other races (American Indian or Alaska Native, Native Hawaiian/other Pacific Islander, and more than one race) were 2.8 times that of White students within the enterprising subgroup ($OR=2.82$, $p < .05$). Similarly, the odds of retention for a first-generation immigrant student were 2.8 times higher than for a student who is not a first-generation immigrant ($OR=2.85$, $p < .01$).

Psychological Factors. The variables representing student's highest level of education expected were significant in this model. Students who expected a bachelor's level of education had 6.8 times the odds ($OR=6.87$, $p < .001$) of retention compared to those who expected less than a bachelor's level of education. Similarly, the odds of retention for those who expected more than a bachelor's level of education were 9.82 times the odds for those who expected less than a bachelor's level of education ($OR=9.82$, $p < .001$).

Pre-college Factors. Within the artistic major subgroup, SAT score was a significant predictor of retention. For every 100 points of increase in SAT Score, the odds of retention

increased by one point (OR=1.001, $p<.01$). This outcome is similar to those within the whole group and other subgroups.

Social and Academic Integration. Factors related to social and academic integration were significant within the model. In comparison to those who indicated disagreement with satisfaction with social engagement, the odds of retention for those who indicated agreement were 101% higher (OR=2.01, $p<.05$) and the odds for those who strongly agreed that they were satisfied with their social integration were 258% higher (OR=3.58, $p<.001$).

The odds of retention for those who indicated agreement with their level of satisfaction with their academic experience were 2.76 times the odds of those who indicated disagreement (OR=2.76, $p<.01$). Likewise, students who indicated strong agreement with their level of satisfaction with academic integration had odds of retention 3.71 times the odds of those who indicated disagreement with their level of satisfaction with their academic experience (OR=3.71, $p<.001$).

College Experience. Within the college experience category, college GPA was found to be a significant predictor of retention within the artistic major subgroup. For each point of increase in college GPA, the odds of retention were 59% higher (OR=1.59, $p<.001$).

Institutional Factors. The variables related to institutional factors that had significance in this model were related to institutional selectivity. According to Table 14, moderately selective institutions had 99% higher odds of student retention (OR=1.99, $p<.05$) than low selective institutions. Very selective institutions had 2.02 times the odds of retaining students in comparison to low selective institutions (OR=2.02, $p<.01$).

Table 14

Enterprising Subgroup Logistic Regression, Dependent Variable: Retention

Retention	Odds Ratio	Standard Error	Significance
Female	0.922	0.184	
African American	0.548	0.160	*
Hispanic	0.615	0.219	
Asian	0.492	0.267	
Other Races	2.820	1.438	*
Age	0.902	0.056	
Total Income (log)	1.033	0.051	
Parent Ed. Bach	1.456	0.358	
Parent Ed. Above Bach	1.275	0.331	
First-Generation Immigration Status	2.855	1.152	**
Acad. Confidence: Ability to Succeed Agree	1.239	0.382	
Student Highest Level of Educ. Exp. BA	6.871	2.679	***
Student Highest Level of Educ. Exp. Above BA	9.825	3.899	***
Moderate HS GPA	1.072	0.368	
High HS GPA	1.179	0.340	
Highest HS GPA	1.959	0.675	
SAT Score	1.001	0.001	**
Pell Amount (log)	1.049	0.034	
Total Federal Work Study (log)	1.026	0.038	
Total Loans (log)	1.028	0.025	
Satisfaction with Social Eng. Neutral	1.847	0.623	
Satisfaction with Social Eng. Agree	2.010	0.562	*
Satisfaction with Social Eng. Strongly Agree	3.580	1.044	***
Satisfaction with Acad. Eng. Neutral	1.984	0.773	
Satisfaction with Acad. Eng. Agree	2.765	0.946	**
Satisfaction with Acad. Eng. Strongly Agree	3.716	1.360	***
College GPA	1.599	0.209	***

Retention	Odds Ratio	Standard Error	Significance
Institutional Control: Public	1.074	0.268	
Institutional Selectivity: Mod Selective	1.991	0.506	**
Institutional Selectivity: Very Selective	2.029	0.653	*
Institutional Size: Medium	1.500	0.451	
Institutional Size: Large	1.209	0.383	
Note: Significance: ***p<.001; **p<0.01; *p<.05			

Summary

Within the whole group, the academic discipline variables were not found to be significant, meaning that the retention rate across all disciplines was not significantly different after controlling for all other factors. Further, high school GPA did not present as a significant predictor both across the whole group and across each of the subgroups. In addition, although not a focus of this particular study, college GPA proved to be a significant predictor across each of the models. Social and academic integration factors were found to be significant in predicting retention for the whole sample, but the relationship between integration and retention was found to be different across disciplines. Specifically, factors related to social integration were not significant within the investigative subgroup. Likewise, none of the factors related to academic integration were significant within the artistic group. Social integration was found to be important in predicting retention for all disciplines except the investigative subgroup. On the other hand, academic integration seemed to be important for all disciplines except the artistic group.

Within all subgroups institutional factors were significant within the model, with the exception of the artistic subgroup (for which none of the institutional factors were significant within the model). Within the whole group and across all subgroups, the variables related to the

student's expected highest level of education were the most highly related to student retention within the models. The gender variable was only significant within the investigative subgroup and the race variable was only significant within the enterprising subgroup. By and large, the results presented within this chapter support previous research on the topic of student retention.

Chapter 5: Conclusions and Implications

Introduction

The purpose of this study was to examine the relationship between student retention and social and academic engagement, and how it varies by academic discipline. Research indicates that students may have varied experiences within higher education based on their academic discipline (Pascarella & Terenzini, 2005). Such varied experiences may be due to integration factors related to their social and academic experience. How these differences lead to varied retention outcomes and the degree to which that is the case is an area of inquiry that is minimally explored throughout the retention literature.

While there have been studies that concluded with mixed results about the relationship between academic discipline and retention outcomes, there is common agreement that the experiences of students in different majors may be very different (Pascarella & Terenzini, 2005; Xu, 2016). Many disciplines have their own standards related to admission, preparation requirements, requirements for completion, and measures for success, which may lead to students studying within the various disciplines to experience the university in different ways (DesJardins et al., 2002-2003). The study of retention based on the interaction between integration and academic discipline will add significantly to the body of knowledge related to student retention. As such, this study explored the disciplinary differences in college student retention along with the impact of social and academic integration across the disciplines.

Findings

Q1: How is academic and social integration distributed across different disciplines?

Information about the social and academic integration distribution across the academic major discipline subgroups was provided within the descriptive analysis. The variables related to social and academic integration were coded into the categories of disagree, neutral, agree, and

strongly agree. Within the sample, a much larger percentage of students indicated strong agreement and agreement in terms of satisfaction with their levels of social and academic integration than those indicating disagreement with their levels of satisfaction. Both the enterprising and social subgroups indicated the highest levels of strong agreement with satisfaction with social integration; percentages were slightly higher than those within the artistic subgroup. Although this is the case, students within the artistic subgroup and the investigative subgroup were among those with the two highest retention rates.

With regard to academic engagement as well, a much larger percentage of students indicated overall agreement with their levels of satisfaction. Again, the social subgroup had the highest percentage of students indicating strong agreement, while each of the other subgroups had the same percentage of students indicating strong agreement with satisfaction with academic integration. Although each subgroup had the same percentage of students indicate disagreement with satisfaction with academic integration, the social subgroup had the lowest percentage of students indicate neutral agreement. Although this is the case, the overall retention rate for the social subgroup was two points below the investigative and artistic subgroups. The enterprising subgroup had the highest number of students agreeing with satisfaction with their level of academic integration, while the investigative subgroup had the lowest.

In summary, most students indicated agreement or strong agreement with their level of satisfaction with both academic and social integration. The highest frequency among students from all academic discipline subgroups was for strong agreement with their levels of satisfaction with social and academic integration.

Q2: Are student retention rates different between students from different academic disciplines?

The descriptive results show differences, but the differences disappear after controlling for other factors. The investigative and artistic subgroups had the highest levels of retention, which matches the retention rate for the whole group. The retention rate for the social group was two points lower than the investigative and artistic subgroups, while the retention rate for the enterprising group was five points lower.

Q3: In general, does academic and social integration relate to student retention?

Yes, academic and social integration factors were both found to be important in predicting retention in general, after controlling for all other factors in the model. Further, it was found that the degree to which social and academic integration does relate to academic discipline varies by subgroup. Information about the social and academic integration distribution across academic major discipline categories was provided within the logistic regression analysis.

Q4: Does the relationship between academic/social integration and student retention differ across different academic disciplines? If so, how?

Social Integration

The subgroup which showed no significance for social integration was the investigative subgroup, which includes such disciplines as biology, civil engineering, mathematics, and sociology. Alternatively, those within the artistic subgroup (which includes such disciplines as art, English, foreign languages, journalism, music, and theater) were much more sensitive to social integration.

Those within the social subgroup, which includes such majors as counseling psychology, elementary education, nursing, and American history, showed minimal significance for both social and academic integration while leaning toward social integration as a strong influence on student retention. The enterprising subgroup, which includes majors such as pre-law, public

policy analysis, business management, marketing, and finance, shows a relationship between social integration and student retention on all levels except neutral agreement for both.

In summary, the relationship between social integration and student retention was significant for all disciplines except the investigative group.

Academic Integration

The findings related to academic integration across the academic discipline subgroups are similar to those of social engagement. All subgroups, with the exception of the artistic subgroup, showed a significant relationship between academic integration and student retention. The investigative subgroup showed significance in all variables related to academic integration and its relationship with student retention.

Those within the social subgroup showed significance in the relationship between strong academic integration and student retention and those within the enterprising subgroup showed significance within the relationship between agreement and strong agreement with academic engagement and student retention.

Implications for Theory

The conceptual model for this study incorporated theoretical models of Holland (1966), Bean (1980), Chickering and Gamson (1987), Astin (1984), Tinto (1975), and Pascarella and Terenzini (2005). The models used to form the conceptual model for this study utilize the various factors found within the conceptual model of this study. These include such factors as student demographics, psychological factors, institutional influences, economic factors, social and academic integration, college experience, and pre-college factors.

As this study took a particular focus on student retention outcomes by academic discipline, Holland's (1966) theory of academic disciplines was used to categorize the academic majors within this study. While most studies examining student retention utilize Holland's

theory to group academic disciplines, this study expanded the use of Holland's theory as extensive subgroup analysis was completed utilizing each category. The findings from this study support previous research related to student retention and the differential effects across disciplines, while also quantifying those differences as they relate to social and academic integration.

Implications for Policy and Practice

Social Integration

Academic Unit Level Focus of Student Retention Plans. Given the findings of this study, along with the number of studies supported by these findings, it is essential that student retention planning include plans for meaningful inclusion of academic units and that such planning occur within academic units. The planning for student retention typically occurs at the institutional level, with participation from representatives from various areas throughout the institution. Given the findings of this study, it is important that student retention planning take place not only at the institutional level but also at the academic unit level, given the varied needs of students from diverse majors.

Improved Institution-wide Retention Planning Inclusive of Academic Discipline Initiatives. As social integration was so highly related to positive retention outcomes for the whole group and for students from all but one of the subgroups examined in this study, it will be necessary for institution-wide retention planning to continue while also implementing initiatives in consideration of the unique characteristics and needs within the academic units. This could include increased representation from academic units at the institutional retention planning level, with a focused responsibility for representation of the nuances of their academic unit.

More Opportunities for Social Integration at the Academic Unit Level. The factors related to social integration are largely accepted to include participation in clubs and

organizations, involvement with the arts, and activities such as club sports. Many of these forms of integration happen at the institutional level and the nature of these activities may preclude participation from within the academic unit. The overall findings within the literature emphasize the significant positive relationship between social integration and student retention. This study supports those findings while also validating the findings across all but one academic discipline category. As such, it is imperative that there are more opportunities for social integration at the academic major level.

Student Participation in Professional Organizations and Mentoring Programs.

Student participation in professional organizations and mentoring programs that are specific to their field create an opportunity for engagement with faculty, advanced students, and alumni. These activities supported at the academic unit level create a level of social integration while supplementing the benefits of internships by immersing students in the practice of the field and with practitioners already working within the field.

Academic Integration

Faculty and Student Engagement Outside of the Classroom. It has been established within this study that informal and formal faculty interactions with students lead to increased positive retention outcomes; this was the case for all but one subgroup, the artistic subgroup. While such interactions may happen more naturally within the classroom, efforts that lead to student and faculty interaction outside of the classroom can be more difficult. If academic student programming such as panels, colloquia, and presentations of faculty research to students were rewarded through the promotion and tenure process, faculty may find it more justifiable of their time to meaningfully engage in such interactions. Further, faculty who are not tenured or tenure-track may participate in similar ways, perhaps focusing more on the practice of the

academic discipline; such engagement could be supported through the promotion and re-appointment process.

Student Opportunities for Research Participation. Opportunities for academic integration are readily available through student research collaboration with faculty. This may be achieved through student honors programs in which students are selected to assist faculty with their research. This type of interaction may raise a student's educational aspirations from bachelor's attainment to post-bachelor's attainment, which was proven within each model in this study to be a highly significant predictor of student retention. Further, participation in such an ongoing process could lead to further feelings of belonging, and thus impetus to return.

Academic Advisement. There are several models that are implemented for academic advisement within colleges and universities. At some institutions, academic advisement is implemented at a campus-level office while some institutions conduct academic advisement within the academic unit. When conducted by well-supported faculty within the academic unit, it provides the opportunity for faculty to engage in a formal interaction with the student outside of the classroom. This could work to establish rapport and enable faculty to extend academic discussions and provide information on academic resources such as internships through interactions that may not be as academically meaningful when they take place outside of the academic unit.

Implications for Future Research

Continued Examination of Retention at the Level of Academic Discipline

The findings of this study indicate significant variance in the factors related to student retention outcomes among the various major subgroups. This validates the research which indicates that students within different majors have varying experiences related to their social and academic integration and that those experiences are related to different levels of retention.

This study aids in quantifying those differences; however, more research is necessary to adequately capture both the quantitative differences and the qualitative differences in the experiences of students from varying major disciplines.

Holland's (1966) Theory for Academic Disciplines. Although Holland's (1966) theory for academic disciplines is the authoritative method for grouping academic disciplines in retention literature, there is a need to investigate student retention factors related to academic discipline in a less aggregated manner. This is often seen in studies on STEM student outcomes. While the current approach adds to the literature on the topic of retention, it does not answer questions about the relationship between individual academic disciplines and retention through the lens of social and academic integration. Upon further study, there will be a need to more meaningfully investigate student retention factors within specific majors.

Investigative and Artistic Subgroup Levels of Satisfaction versus Retention Outcomes. The findings of this study indicate that social integration is not significantly related to student retention for those within the investigative subgroup. Likewise, the findings of this study indicate that academic integration is not significantly related to student retention for those within the artistic group. Interestingly, these two subgroups share the highest retention rates (73%) among the four subgroups. More research is necessary to better understand the specific aspects of social and academic integration pertaining to these two groups.

Qualitative and Mixed-Methods Studies on Retention. Most studies on retention and persistence are understandably quantitative. The qualitative studies included within the literature review of this study add a wealth of context to the scholarship on retention and persistence. Further, while more recent studies utilize a nationally representative sample, many of the studies related to retention and persistence are single-institution studies, which present a limitation on

generalization. The addition of qualitative and mixed-methods studies within the literature on student retention will add context to the scholarly discussion on the topic.

Academic discipline has been identified as a significant variable in studies related to student retention; however, the number of studies that focus specifically on this topic remains low. As this study finds, there are a number of factors that are significantly related to student retention at the academic discipline level. It will be important that this topic is explored further so that recommendations emanating from the identified implications may be effectuated at institutions.

The Beginning Postsecondary Student Survey/NCES Data Collection. The literature reveals that there are a number of robust data sets which allow for the study of retention and persistence at the national level. The Beginning Postsecondary Student survey is an instrument that has been utilized in such studies in the past, and includes data found in other databases. In the case of the BPS survey, the items related to social and academic integration follow the primary theoretical framework guiding this study—Tinto (1975). However, to address the questions of student retention in a more meaningful way, it will become necessary for the inclusion of more specific questions that are targeted to student retention factors.

Finally, although a rich source of national data on higher education, the BPS has limitations related to the points at which it collects data. As identified in Chapter 3, the main limitation identified within previous studies has been that data for some key variables are not collected during each administration of the survey (Chen, 2009; Kim, 2007). Consistent with the limitation identified by Chen (2009), the BPS survey collected data related to major during each of its data collection periods during the 1996/2001 administration of the survey. However, data on students who may have selected a particular major between data collection points was not

collected (Chen, 2009). This limitation was mitigated for this study, as the focus of this study was on first-year retention only. To strengthen further study on this very important topic, tracking major discipline data more consistently throughout the life cycle of the student will be necessary. This may be done by requesting academic discipline change information from institutions and capturing that data by creating the appropriate fields within the BPS survey.

Summary of Implications

As indicated in Chapter 1, student retention has been a highly researched area within the field of higher education, primarily during the past five decades. Throughout these five decades, the actual outcomes related to retention have remained consistently low (Slanger et al., 2015; Tinto, 2006). Past research has found that low student retention in the college and university setting has an impact on individuals, higher education institutions, and society (Pascarella & Terenzini, 2005; Tinto, 2006; Xu, 2016). Tinto (1993) found that students who are not successfully integrated into their institution are likely to attrite.

While a number of subcategories have emerged as areas of particular foci within the broader topic of student retention, there have been very few studies examining factors leading to and outcomes related to retention vis-à-vis academic discipline. A major goal of this study was to illuminate these findings while spurring an increase in the body of literature on this topic. This study supports previous findings related to student retention while adding to the retention literature findings that quantify the relationship between social and academic integration and student retention through the lens of academic discipline.

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