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Influence of Remaining Unmet Financial Need on the Persistence Behaviors of Students

Enrolled at a Small, Private, Liberal Arts Institution of Higher Education

Zachary Yoder

A dissertation submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

In

Partial Fulfillment of the Requirements

for the degree of

Doctor of Philosophy

School of Strategic Leadership Studies

April 2020

FACULTY COMMITTEE

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Abstract

This single institution, quantitative study examined the degree to which remaining unmet financial need affected both 2nd fall and 3rd fall persistence measures at a small, private, religiously affiliated, liberal arts university in the southeastern United States. The purpose of this research was to contribute to the literature on college persistence and explore the complex world of how students finance their college education. A hierarchical logistic regression analysis was used to determine if the control variables (entry year, gender, race/ethnicity) and independent variables (high school GPA (HSGPA) and remaining unmet financial need (RUFN)) were significant contributors to models that predicted both 2nd fall (3rd semester) and 3rd fall (5th semester) persistence. The findings of this study suggest that RUFN was a statistically significant predictor of both 2nd fall and 3rd fall persistence, as was HSGPA. The control variables were all non-significant in models that included HSGPA or RUFN. The implications of knowing a student's RUFN are provided, along with recommendations for future research involving higher education leadership and RUFN.

Chapter 1-Introduction

In his book (2015) "Breakpoint: The Changing Marketplace for Higher Education," Jon McGee hypothesizes that long-running trajectories involving demographics, cultures, and economic factors have begun to uncomfortably challenge many of the long-standing assumptions that institutions of higher education have had about their students and their missions. These assumptions include the type of curricular content students prefer, the desired pedagogical delivery of that content, effective prospective student recruiting and retaining practices, and technological innovations that both streamline and add complexity to the student experience. McGee frames the new reality for college and universities around five important ideas: Accessibility, Affordability, Accountability, Sustainability, and Differentiation. In order for the sector of higher education to function effectively (i.e. meet the needs of all stakeholders), the expectations and realities of students, their families, public policy, and the institutions must align reasonably well with respect to the ideas that McGee presents in his book. From a leadership vantage point, three key questions need to be asked and answered appropriately in order to best serve students: what are we trying to achieve educationally, how will we deliver our programs/experiences to our students, and who *does* and *should* attend my institution (McGee, 2015)?

This third question (who *does* and *should* attend my institution) relates to the first two ideas McGee presents in his book, *accessibility* and *affordability*, and speaks directly to the financial concerns of students, their families, and the institutions they attend. Leadership at colleges and universities must be prepared to deal with financial realities

related to student enrollment and success that have become significantly more complicated over the past ten years. McGee's third question can easily be framed another way: "Who can afford us and whom can we afford?" (McGee, 2015, p. 4). Almost all institutions of higher education need students that are willing to pay in order to survive and operate. This reality is particularly poignant for small, private colleges with fewer than 1,000 students (Busta, 2019). Part of this challenge stems from the ways that students and their families pay for a college education, which can be as idiosyncratic as the reasons that students choose to attend a particular institution.

Small, private, liberal arts colleges, many of which have a religious affiliation, are experiencing a large degree of uncertainty for their futures due to numerous risk factors. These risk factors include enrolling less than 1,000 students, large annual tuition increases, the absence of robust online programs, and a dependence on tuition for more than 85% of revenue (Busta, 2019). According to Kent Chabotar, an expert in higher education finance and former president of Guilford College, these institutions are facing three concurrent dynamics, or the "iron triangle of doom," that spell trouble. He is quoted as saying, "There are fewer students out there. Of those students, fewer are attending colleges and universities. And it's costing us more to get them in terms of financial aid" (Woodhouse, 2015).

The first risk factor that Chabotar highlights, the declining number of traditional-aged college students, is fortunately not an overnight, unexpected phenomenon. Every traditional student that will begin college over the next decade is already enrolled in a school somewhere. After a peak of around 3.4 million in 2010-11, the number of high school graduates nationally began to decline slowly and it is not estimated to reach 2010-

11 levels again until 2023-24. At this point, starting in 2026, the proverbial "enrollment cliff" is expected to occur, and the number of high school graduates is expected to drop almost 15% in less than six years. Combining this with current migration and immigration patterns, many areas of the country (Midwest and Northeast) are expected to see even sharper declines in traditional college-aged students (Grawe, 2018).

Chabotar's second risk factor incorporates both a leveling-off of high school completion rates and static high school-to-college participation rates. In addition, the marketplace of traditional college students has become more congested and competitive over the past decade. Since 1996, just over 20 years ago, there are 1,000 *more* degree-granting colleges and universities (McGee, 2015). With respect to the demographic of students that are entering the college marketplace, a larger percentage of them will be first-generation students with family income levels at or below poverty level (The 2015 Student Success State of the Union, 2015). Leaders at small, enrollment driven institutions, who rely primarily on traditional-aged college students, need to have a clear understanding that they are unlikely to be able to rely on population growth and wealthy families to sustain their enrollment levels.

The third risk factor, the competition among institutions that drives larger financial aid packages for students, is evident in the increasing number of degree-granting colleges and in the increasing discount rate that institutions are using to recruit students. While most of the recently formed degree-granting institutions are not considered part of the traditional 4-year residential college sector, their addition to an already crowded postsecondary marketplace has raised the level of competitive pressure that most institutions are feeling. One manifestation of this competitive pressure is the

annual increase in the discount rate provided to students at all types of institutions, most notably small, private institutions that rely on tuition as their main source of revenue.

Discounting student tuition is a strategy of the high price/high aid model that many private colleges utilize. The primary characteristic of this high price/high aid model is price discrimination, where institutional grants/scholarships are provided to students for a variety of reasons, including academic merit, personal characteristics, and financial need. At most institutions, this "tuition-discount" is nothing more than a discount off the arbitrary sticker price, as a large majority of institutional aid offered is in the form of an unfunded award. In 2014, the ratio of unfunded to funded institutional aid was 5:1 compared with a ratio of 2:1 in 1997. The reality of this large increase in unfunded institutional aid is the subsequent large increase in "sticker price" to attend a particular institution, a published rate that virtually no student pays (Rine, 2016).

At many private institutions, the discount rate (the average amount of tuition that a student pays after institutional scholarships/grants are applied to their aid package) is climbing to potentially unsustainable levels (Valbrun, 2019). Tuition discounting has existed for a long time but has recently become a significant practice of listing one price for tuition but offering deals for select students, or in the case of many small, private institutions, almost all students. What was once hailed as a progressive way to increase the diversity of an institution by transferring money from individuals with greater means to those with more need has been turned upside down and at many institutions, unbeknownst to both types of students, the needy student is supporting the "meritorious" student (Wu, 2017). Additionally, tuition discounting does not factor in auxiliary costs, such as room and meals, course fees, books, and transportation. Institutions that rely on a

traditional, residential model of college may face even larger financial pressures due to less students being able to afford to live on campus, leaving empty rooms in dorms. The issue of the "real cost of attending college" and how it affects college students has led a group of researchers to start the Hope Center for College, Community, and Justice. This organization is dedicated to identifying and researching how basic student needs, such as food, affordable housing, childcare, and transportation intersect with college students and the institutions they attend (The Hope Center, 2020).

Current Landscape for Small, Private Institutions

An example of this "iron triangle of doom" was evident in the (almost) closing of Sweet Briar College in March of 2015. While a robust alumni fundraising effort eventually saved the college from closing, the news of its struggle triggered predictions of doom and gloom for similar, small, private institutions across the nation, causing many to wonder "Who's next?" (Cohen, 2015). This incident, along with other popular press predictions of future closures and mergers, has put many college administrators, especially at institutions that are enrollment driven, in the hot seat regarding their school's future (Hoover, 2014). In 2015, Moody's Investor Service predicted that the closure of small colleges and universities would triple in the coming years and that by 2017, over 15 institutions a year would close or merge (Woodhouse, 2015). While this headline grabbing prediction did not quite come true, there has indeed been an increase in college closures over the past three years, to an average of around 11 per year. Additionally, a more recent Moody's projection is that one in five small private colleges are under fundamental financial stress (Seltzer, 2018).

Is College Worth it?

Decreasing retention and graduation rates have led many critics to argue that institutions of higher education are no longer worth the investment and that many degrees are a waste of money (Is College Worth It?, 2014). A nation-wide debate, fueled by political and presidential discussions of "free" college education has put administrators in higher education on the defensive (Smith, 2015). Additionally, many colleges and universities across the country are facing increased criticism after years of tuition increase and perceptions of poor preparation for their students entering the workplace. Students, parents, alumni, trustees, and even politicians are asking colleges to provide evidence of student success as determined by a myriad of outcomes. In 2015, the U.S. Department of Education released their "College Scorecard" website that attempts to provide comparative information on average annual cost, graduation rates, and student retention rates of individual colleges and universities (U.S. Department of Education, 2015).

In this environment, many institutions of higher education are being forced to re-examine their internal structures (administrative costs, faculty-to-student ratios, auxiliary services) and pay closer attention to both enrolling more students and helping them retain and graduate once they enroll. While admitting new students will always be an important piece of the enrollment puzzle, more than a few higher education pundits believe that retention and student success initiatives are increasingly starting to become priorities across a variety of campuses, including 4-year, private, liberal arts colleges and universities (Field, 2018; Grawe, 2018; Jaschik, 2018) . To help students transition to their institutions, progress towards a degree, and graduate, administrators must help

students both adjust and thrive in their new environments by accommodating student learning styles and interests (Lau, 2003). Additionally, colleges and universities must enroll students that are both financially willing and able to enroll and persist. This ability and willingness to pay is a function of several different facets, starting with student/family financial variables such as parental income levels, college savings accounts, assets, and credit scores. It also includes federal, state, local, and institutional financing options and policies.

Student Finance

Most students pay for their education through a combination of scholarships/grants, savings and payment plans, and student loans. A recent poll by Sallie Mae reported that scholarships, income and savings, and loans each cover roughly a third of students' tuition, room/meals, and fees (Lobosco, 2017). Only nine percent of students reported using a college savings plan to help fund their college education while almost half of all students reported borrowing money to pay for college (Lederman, 2008).

The debate of "Who should pay for college?" has been ongoing for a long time and stems from the private vs. public benefits that higher education provides. Any funding policy, at the local, state, or federal level, tries to measure the important and often vexing amount of public benefit that is a direct result of higher education services. According to Toutkoushian and Paulsen (2016):

> Researchers have concluded that when students go to college, it results in
> economic, health, and social benefits for others. The economic spillover benefits
> for society may include higher tax contributions, which are then used to provide

services for the public, enhanced economic growth, reduced unemployment, and

higher quality of workforce. Some of the health benefits that emerge from higher

education are reductions in second-hand smoke and increased blood donations.

Finally, there is a range of possible social benefits for the public form college,

such as improved civic participation, increased donations to charities, greater rates

of volunteerism, reduced crime rates, and increased racial tolerance (p. 205).

While researchers are in relative agreement that when students go to college, there are

economic, health, and social benefits for everyone, the amount of public benefit is

difficult to measure (Mayhew, et al., 2016). In theory, if half of the benefit of graduating

from college is public and the other half is private, then the government should pay for

half of a student's college education. However, measuring the amount of public vs.

private benefit has proven to be a very difficult task and better and more accurate

estimates of public external benefits are essential to move this debate forward

(Toutkoushian & Paulsen, 2016).

Private benefits resulting from higher education are often easier to measure and

communicate to the public. The most common private benefit communicated in the

media, and among higher education researchers, is average annual salary based on the

highest level of education. Using the median earnings for each group, individuals with a

bachelor's degree make 67% more per year ($53,882 vs. $32,320) than individuals with

only a high school degree. This number increases to almost 90% more when including

bachelor's degree and higher median earnings ($61, 273) compared with high school

degree only ($32,320) (United States Census Bureau, 2017). This median average salary

calculation is also likely biased in favor of high school only educated individuals, as

many average salary comparisons include only working adults and fail to include unemployed adults, which are more likely to have lower levels of education (Toutkoushian & Paulsen, 2016).

Other private benefits of going to college are also being explored with more frequency, such as measures of well-being and happiness. A recent study linked higher levels of education to a wide range of private benefits, such as better well-being, less hostile attitudes toward others, and better physical health (Manstead, 2014). In his book, *Higher Learning, Greater Good: The Private and Social Benefits of Higher Education* (2009), professor emeritus Walter McMahon pushes back against the increasingly common public sentiment that higher education is primarily about earning a higher salary. His book highlights other private benefits of higher education and cites improved health (lower smoking and obesity rates) and parenting (lower infant mortality and childhood obesity rates) as two important examples.

Who *should* pay for college?

Over the past few decades, the financial burden of enrolling and persisting in college has gradually shifted away from governments and institutions to the individual students and their families. At the turn of the century, college students who went to public institutions paid for around one-third of their education. In 2018, students pay for most of their education in more than half of all states (Selingo, 2018) and all but two states have seen a reduction in state support since 1980, with Colorado leading the way, at almost a 70% reduction in state support between 1990 and 2011 (Mortenson, 2012). The declining financial contribution to higher education that each state government provides has been a popular topic in the press recently (Selingo, 2018; Wyllie, 2018) and

overall state funding is currently more than $7 billion below where it was before the 2008

Great Recession (Mortenson, 2012). Higher education has always been somewhat of a

balance wheel for state lawmakers, as they can always raise tuition to cover budget

shortfalls; the same cannot be said for prisons, health care, or K-12 education (Delaney &

Doyle, 2011; Selingo, 2018,). One recent researcher concluded that the biggest

contributor to the decline in higher education funding was state spending on Medicaid

(Weber, 2018).

Types of public and private financial aid

Financial aid, in itself, is a response to the first two key ideas of accessibility and

affordability presented by McGee. Historically, universities have always competed for

students and while institutions compete for students through non-price mechanisms, such

as prestige and academic offerings, price competition remains a key variable to attract

students. Lowering the cost is one way that schools can compete for students, but

another common response is to provide financial aid to help reduce the net price that

students pay on the advertised tuition and fees (Toutkoushian & Paulsen, 2016).

There is a diverse and expanding body of research that examines the impact that

various financial aid programs have on student outcomes. This research covers the gamut

of financial aid programs, including federal, state, and institutional policies and how they

affect student persistence (Hossler, Ziskin, Gross, Kim, & Cekic, 2009). At the macro

level, Pascarella and Terenzini (2005) concluded that students who receive some type of

financial aid, especially grants and scholarships, were at least as likely as other students

to retain and graduate. There is even evidence that simply applying for financial aid may

help promote educational attainment outcomes both through increasing financial support

offered to a student, but also by signaling a student commitment to the importance of college (Mayhew, et al., 2016).

Additional research related to student financial aid has included loans, work study, and merit-based scholarships as predictors of educational persistence. Almost all of these studies have results that vary dramatically, with some of the studies being positively related, some negatively related, and others with no significant relation. Recent studies have also looked at how state performance funding impacts retention and graduation rates and the results have been mixed or insignificant that these performance funding policies improve student success metrics (Li, 2017). This type of funding has also incentivized many regional, comprehensive universities to decrease their access for students, since their source of funding has shifted from the number of students enrolled to the number of students retained and graduated (Orphan, 2015). Leaders at these institutions need to continue to educate the public and politicians on the realities of what it means to hold institutions accountable for student success and the unintended consequences of this type of funding, which could include more recruitment of out of state students and less access for students from lower SES families (Jaquette & Salazar, 2018).

One aspect that makes the intersection of financial aid on student outcomes particularly difficult to study is that eligibility for both types of financial aid (merit-based and need-based) is based on pre-enrollment characteristics that are strongly correlated with persistence and graduation outcomes. Financial assistance is not an exogenous variable and it is almost never awarded at random (Toutkoushian & Paulsen, 2016). The characteristics associated with financial aid, such as socio-economic status, standardized

test scores, and high school GPA are often not controlled for in research designs, which can lead to inaccurate conclusions regarding the impact of financial aid on student outcomes (Mayhew, et al., 2016). Quasi-experimental approaches to answering these questions can be used to determine if there are significant differences in the persistence rates of students who face different net prices but have otherwise similar characteristics.

Study Rationale

For institutions of higher education, there are both practical and ethical reasons to focus on the impact that student finance has on student outcomes. At small, private, tuition-driven colleges and universities, institutional priorities, policies, and actions play a large and significant role in the student finance equation. It is impossible for these institutions to remove themselves from their own policies due to the large percentage of tuition discount that is "unfunded." Decisions about merit vs. need-based aid, how endowed scholarships are "sunk" into financial aid policies, and the schools/areas targeted through admission procedures are all intricately meshed with student financial realities. No longer can students expect to be able to afford attending these private institutions through borrowing student loans and working hard in the summer to pay off their future tuition balance. Forward thinking institutions need to have a clear understanding whether or not they have the will and capacity to support students that are coming from families with little or no ability to pay.

Access to higher education has been a controversial topic for many years (Hartocollis, 2018; Landmark Cases, 2018; Mears, 2014), most often focused on the legal and moral aspects of admissions decisions related to race/ethnicity (affirmative action). This debate is likely to continue for years at the most highly selective and prestigious

universities around the world. The opposite end of the college enrollment equation is graduation and all institutions of higher education, regardless of selectivity, have an obligation to share in the responsibility of increasing the number of their students that graduate with a degree. This obligation has become part of the public discourse and one manifestation is the renewed interest in performance-based funding for institutions of higher education. Much of this renewed interest followed Tennessee's 2010 development of a performance-based funding system, in which all state appropriations for public higher education institutions were based on specific performance metrics (Toutkoushian & Paulsen, 2016). In 2018, 36 states had either approved or enacted some type of performance-based funding for public institutions of higher education (Obergfell, 2018).

The metrics of retention and graduation rates have been used for years as proxies for educational quality, and with lawmakers and the public having instant access to these "quality" measures, institutions are increasingly focused on improving these metrics (Hossler, Ziskin, Gross, Kim, & Cekic, 2009). The message about the importance of student retention and completion has permeated into the faculty and front-line staff ranks, with deans, chairs, institutional research directors, and financial officers continuing to respond to increased pressures toward this completion mandate. As mentioned previously, many states have implemented some type of performance funding for public colleges and universities, as citizens and politicians demand accountability for scare taxpayer dollars (Zumeta & Li, 2016). The efforts of colleges and universities to improve student success (earning a degree), while balancing the importance of diversity, equity, and inclusion, may well be the defining characteristic in which this generation of higher education leaders will be evaluated (Gagliardi & Wilkinson, 2017).

For many small, private, enrollment driven colleges and universities, this obligation to help students persist and graduate goes far beyond the moral imperative of providing both a public and private benefit for students that are likely taking out student loans to finance their education. This obligation is one of survival. Without increased levels of retention and graduation, many of these college and universities will face a real and predictable financial quandary, as the "iron triangle of doom" continues to manifest in the higher education sector.

One area where research has consistently yielded similar results is the negative impact that remaining (unmet) financial need has on educational persistence. Even after controlling for numerous other factors, students that have remaining need in their financial aid package drop out at higher rates that their peers without any remaining need (Benson, 2018; Bresciani & Carson, 2002). Traditionally, remaining need is calculated by using the estimated cost of attendance and subtracting all institutional, state, and federal grants and scholarships. At this point, a student's calculated EFC (expected family contribution) is subtracted to determine the remaining need of a student. However, the definition of "remaining need" is potentially problematic due to the various ways that colleges and universities award their student financial aid packages and the complexity in how a student's EFC is determined (Baum, 2015).

A leading scholar in financial aid research, Sara Goldrick-Rab, also raises concerns that the typical standard definition of remaining need is not a true reflection of the actual cost of attending college for many working and lower-class students (2016). She writes, "The debates about the cost of college often dismiss the importance of addressing living costs, suggesting they aren't really educational expenses. But students

have to pay for books, food, rent, and gas if they are to have any chance of succeeding in school" (Goldrick-Rab, 2016, p. 41). The reality is that institutional, state, and federal financial programs have become so complex and disparate in their purposes that they no longer serve the public, the institutions, or the students very effectively (Hossler, Ziskin, Gross, Kim, & Cekic, 2009). For these reasons, careful consideration and justification of how remaining need is determined for future studies is crucially important.

The undeniable reality is that the remaining need of students, however it is defined, has gotten larger over the past decade at almost all colleges and universities, with a notable exception being the prestigious, elite universities with massive endowments. Many factors have contributed to this increase and include the following: continued increases in tuition (and net price), declining state appropriations for higher education, stagnant eligibility amounts for federal loans and grants, a shift from need-based to merit-based financial assistance, and declining annual family income earnings for families that are in the poorest fifth of households. (Appelbaum, 2017). Together, all of these factors have created a reality for many students where their remaining need has become a significant barrier for enrolling, persisting, and graduating from college.

As previously highlighted, state support for higher education has declined significantly over the past decade, shifting the burden of paying for college to the students and their families. To finance their education, many students must take out federal loans, which do not require any type of credit check for students, but has limits. A dependent student (which includes almost all traditional undergraduate students) can only borrow up to $5500 in federal loans for their first year of enrollment, an amount that has remained flat since 2008-09. A decade ago, this amount covered around 66% of the

average direct costs for an undergraduate student, but in 2014-15, this amount only covered 35% of these average costs. In addition, the Perkins Loan Program was eliminated in 2016-17, further increasing the gap that many students have to fill in order to finance their education (Issue Brief: Loan Limits, 2018). Almost all dependent students needing to borrow more money to finance his or her education are forced to have a credit worthy co-signer for a private student loan or have a parent willing (and able) to take out a federal Parent PLUS loan.

Another factor related to the increase in student's remaining need is the disparity in family earning increases over the past decade. Starting with the Great Recession in 2008-09, average family incomes in the lowest quintile ($0-$30,000) have decreased $571 while the average income of the wealthiest fifth of households has increased by around $13,000, adjusting for inflation in both groups (Appelbaum, 2017). Concurrently, the growth in lower income families ($0-$30,000) between 2000 and 2013 increased almost 30%, while families in the highest two quintiles of income ($90,000-$120,000 and $120,000 and up) saw only small growth percentages of 5% and 6% (The 2015 Student Success State of the Union, 2015). For colleges and universities that are not considered elite institutions, this means that more and more of their students are likely to come from families that have significant financial need, if they show up at all. Susan Dynarski, a University of Michigan professor of public policy, education, and economics has researched how financial aid impacts college choice and says, "Students typically find out about financial aid far too late for it to affect their application choices" (Banerjee, 2018). In the face of all these realities, high quality research into how remaining need influences both the enrollment and persistence of students is desperately needed.

Research Questions

The purpose of this single-institution quantitative study is to explore the relationship between the remaining unmet financial need of students and their educational persistence at a small, private, religiously affiliated liberal arts university in the southeastern United States. Institutional persistence and financial assistance data for traditional first year cohorts will be combined and analyzed to explore the relationship. While the researcher will use individual student level data in the analysis, it is important to consider that the financial situations of students are tied closely to the institutional realities of small, private, enrollment-driven institutions. If students are unable or unwilling to pay, these institutions do not have any type of security blanket (large endowments, taxpayer support) to rely on. If remaining need continues to grow and influence student enrollment and persistence decisions in a negative way, institutions such as the one presented in this case study could be crippled financially and may be forced to close their doors or change in significant ways.

The institution highlighted in this single-institution quantitative study has many contextual challenges that make it unique, yet most other small, private institutions face similar enrollment and financial challenges. Its historical affiliation with a church denomination has created recent tribulations surrounding the issue of same-sex marriage and its faculty hiring policy, an issue that has split the denomination nationally (Shellnutt, 2018). The number of students that self-identify with the denomination has seen a sharp decrease over the past decade, dropping from 52% of traditional first-year students in 2008 to 29% in 2018. There are many potential reasons for this drop and they mirror larger demographic changes, including a drop in denominational affiliation and an

increase in students attending college closer to home (McGee, 2015). Another reality for this institution is a small endowment, with only around 1% of its institutional aid considered funded (Hensley, 2019). While these challenges are contextually specific for the institution being researched, for the other 1,700 other private institutions nationwide, similar challenges are sure to be found (Eide, 2018).

In investigating the impact that remaining unmet financial need has on student outcomes, the following question serves as the fundamental focus of this study: "To what extent does remaining financial need influence educational persistence?" The researcher plans to look beyond the traditional measure of retention, which is defined as the percentage of first year, first-time in college students enrolled in the fall semester that return to the same institution for their second fall semester. Based on the researcher's experience, the remaining need of a student is often masked during their first year due to local scholarships/grants that are usually a one time, non-renewable payment. Instead of only using this traditional measure of retention (the percentage of first-year cohort students that return for their second fall semester), the research plans to use a second dependent variable, the number of students that persist into their junior year, or 5th semester of enrollment. The researcher believes that remaining unmet financial need will have a negative impact on student persistence, including when persistence is measured outside of the traditional measure of 2nd fall retention.

Results gathered from the data analysis will have the potential to help expand the field of retention and student success literature based on remaining unmet financial need, which is an important and evolving measure of financial aid (Mayhew, et al., 2016). The researcher believes that virtually all future persistence research should control for unmet

remaining financial need. Regardless of an institution's academic (tutoring, advising) or social (living communities, student life policies) interventions aimed at increasing student success and persistence, students that are unable to afford to remain enrolled will not be able to persist. Said another way, a student can have the best academic advising, be enrolled in the perfect major with outstanding faculty members, live in an intentional community in a state of the art dorm room, and still not persist at an institution due to the inability to afford the cost of attendance. This study will research the following questions:

     1. To what extent do models that include only demographic control variables predict persistence into the 3rd and 5th semesters of enrollment? It was hypothesized that none of the demographic control variables would have statistically significant odds ratios associated with them and would not influence persistence into either the 3rd or 5th semesters of enrollment.

     2. To what extent does high school grade point average (HSGPA) add to the models that include demographic control variables when predicting the outcomes (persistence into 3rd and 5th semester)? It was hypothesized that there would be a statistically significant odds ratio associated with HSGPA and that students with higher high school GPA's would persist into both the 2nd fall and 3rd fall at higher rates, even after controlling for entry year, race, and gender.

     3. To what extent does remaining unmet financial need (as a continuous variable) add to the models that include HSGPA and demographic control variable when predicting the outcomes (persistence into 3rd and 5th semester)? It was hypothesized that there would be a statistically significant odds ratio associated with remaining unmet financial need (RUFN as a continuous variable) and that students with higher RUFN's would

persist into both the 2nd fall and 3rd fall at lower rates, controlling for HSGPA, entry year, race, and gender.

      4. To what extent does remaining unmet financial need (as a dichotomous grouping variable) add to the models that include HSGPA and demographic control variable when predicting the outcomes (persistence into 3rd and 5th semester)? It was hypothesized that there would be a statistically significant odds ratio associated with remaining unmet financial need (RUFN as a dichotomous variable) and that students in the higher RUFN group (> $5700) would persist into both the 2nd fall and 3rd fall at lower rates that the lower RUFN group (< $5700), controlling for HSGPA, entry year, race, and gender.

Conclusion

      The following chapters contain theoretical, conceptual, and leadership frameworks that help contextualize this research that investigates the relationship between RUFN and measures of persistence. A comprehensive literature review of current institutional strategies to promote persistence is also included. The methodology is described and the results of the hierarchical logistic regression analysis are explored. Finally, the implications of the findings, recommendations for higher education leaders, future research suggestions, and research limitations are provided.

Chapter 2-Models, Frameworks, and Literature Review

This chapter will introduce the theoretical and conceptual framework for this single-institution quantitative study. It will summarize how shared leadership theory contributes to the study and helps contextualize the research question within the broader challenges that higher education administrators and faculty leaders are facing with respect to student success outcomes. Finally, the chapter will provide a comprehensive literature review on student persistence research, starting with research that investigates the between-college effects and then looking at the within-college effects. Research on the impact that financial aid (including unmet financial need) has on student persistence will conclude the literature review.

Theoretical Model

A theoretical approach that describes the paradoxical way that institutional, state, and federal financial programs award students with financial aid is the theory of organized anarchy. First proposed by Cohen and March (1986), and later discussed by various authors such as Manning (2018), organized anarchy highlights the multiple realities that institutions of higher education are contending with on an annual basis. While the term *anarchy* is often associated with chaos, lack of control, and disorder, Cohen and March added the modifier "organized" to help convey the paradoxical nature of organizational structure within higher education (Manning, 2018).

There is little disagreement that higher education institutions have ambiguous, unclear, and often contested organizational goals. Without even comparing the different sectors of higher education (public vs. private, 2-year vs. 4-year, non-profit vs. for-profit) and focusing on small, 4-year, private, non-profit institutions, there are many conflicting

goals. Should faculty members be focusing on teaching, research, or service? Are these faculty goals mutually exclusive? What is the role of external stakeholders to help shape the mission of a college? Is the primary goal of educating students to produce enlightened citizens or workforce ready employees? This complexity is often most vibrantly exemplified within the role of the board of trustees. This group often struggles to understand the internal dynamics present at institutions, especially regarding the voracity that individual faculty or staff members cling to their individual goals (Manning, 2018).

In regards to the topic being explored in this single-institution quantitative study, the theory of organized anarchy is clearly exemplified. Enrolling the budgeted number of first-year students is the main priority of the admissions office, while the financial assistance office has an obligation to ensure that the enrolling students deliver the tuition revenue needed by the institution. Other offices on campus (retention, students services, student life) are tasked with helping enrolled students persist and graduate, thus providing the institution with a four-year revenue stream, along with providing competitive retention and graduation rates.

Organized anarchy has three main characteristics that help to conceptualize its framework in regards to the relationship between remaining unmet need and student persistence: problematic goals, unclear technology, and fluid participation (Cohen & March, 1986). From a student perspective, these three characteristics have the potential to create a confusing and inconsistent experience during their college career, starting with the admissions process and continuing all the way until graduation day. The message a student receives from an admission counselor about enrolling and financing their

education may be different from the message a student gets from their academic advisor, who is often times unaware of a student's financial realities.

The first characteristic of organized anarchy, problematic goals, is clearly portrayed by considering the various goals of the offices' most involved in the enrollment of a student: admissions, financial aid, and retention. From an admissions standpoint, it can be reasonably assumed that institutions with higher levels of pressure to meet enrollment goals (smaller, private, less endowed institutions) will have more customer-friendly admissions offices. Students that apply to the institutions and meet the admissions criteria (high school GPA and SAT/ACT score) are then often provided with highly personalized, responsive, and accommodating admissions counseling. Acceptance letters are sent with large scholarships highlighted to help recruit the student to the institution. The messages are custom tailored to the students' interests (athletics, music, art, major program, etc.) and the eventual goal is to enroll as many students as possible.

Again, conceptualizing an enrollment driven institution relative to problematic goals, the financial aid office has the goal to control the student discount rate. This discount rate is determined by the average amount of institutional scholarship and grant that is given to each student. From a financial perspective, an institution would love to have all students pay full price for their attendance, but with many options for post-secondary education, colleges and universities often provide scholarships and grants to encourage students to enroll. From an academic perspective, an institution would love to have as many high achieving students as possible, but these students often have more options and cost more (higher tuition discounts) in terms of getting them to enroll, which drives up the institutional discount rate. Failing to meet the budgeted discount rate for an

incoming cohort will lead to decreased tuition revenue, which usually leads to unpleasant budget cuts.

After students begin at a university, the retention office is tasked with trying to keep as many current students enrolled as possible. The retention rate has been standardized as percentage of first time, first year students that return for their second year of enrollment at an institution. The retention office's effectiveness is easily measured using this metric and budgets are estimated using historical retention rates, so any dip in retention also has budgetary ramifications. While the retention office has an incentive to try to help as many students as possible stay enrolled, students often get mixed signals from other areas of campus regarding their future enrollment. Academic departments often have departmental criteria required for students to persist in their selected major and students that fail to do so are encouraged to change majors or cease enrollment. Athletes that are recruited may not have the positive experience they anticipated or have a conflict with coaches/teammates and reconsider their commitment to the team (which is often the main reason they choose to attend the university). Students' scholarships are decreased or taken away if they fall below an arbitrary GPA requirement and they are forced to pay more money than expected to persist at the university. All of these factors are involved in a student's decision to remain enrolled at a university and by the time an at-risk student is identified and contacted by the retention office, they often have already decided to transfer or cease enrollment.

Understood through the lens of organized anarchy, the goals of these offices are problematic for a student. Is the admissions office's message that they should enroll and attend the institution being supported by the financial assistance office? Does the

admissions office care if the student retains or not? Can the retention office be held

accountable for the retention rate when they are not involved in the enrollment of the

students or academic departmental policy decisions?

Fluid participation is a second characteristic of organized anarchy that has the

potential to impact students. Fluid participation is the idea that organizational members

vary their involvement from time to time, semester to semester, year to year (Manning,

2018). Admission counselors, a position that is often a temporary job instead of a career

path, are frequently no longer around when the student completes their first year of

enrollment (Phair, 2014). At many small, enrollment driven institutions, faculty are the

primary academic advisors and many students, especially those that change majors, end

up with two or more advisors during their crucial first year of enrollment. In addition,

faculty that serve as the academic advisor for a student may take a sabbatical.

Fluid participation has been blamed as a key characteristic as to why colleges and

universities have a hard time making "rational" financial decisions. Committee

compositions change annually, faculty meetings are held when not everyone is able to

attend, financial realties force undesirable compromises, and new deans or vice

presidents change the agenda to suit their personal desires and interest. Without stable

levels of participation, there are very few, if any, situations where decisions on two

related issues are made by the same group of people (Birnbaum, 1988).

Unclear technology is the final characteristic of the organized anarchy model that

relates to potential student outcomes. In the context of this research, unclear technology

refers to the idea that members within an organization may not fully understand the

various processes that students must navigate to enroll and persist at a university (Cohen

& March, 1986). Again, considering the impact that remaining need has on persistence, should academic advisors have access to a student's financial realities when advising a student? Do they know what it means financially for students to enroll in a summer course? What options does a student have that wants to persist at an institution but has already maxed out their student loan eligibility? Is the message students are getting from an advisor, about needing to repeat a class they earned a C- in, supported by the financial aid office?

In summary, the theory of organized anarchy provides a theoretical framework for researching the question of how remaining need affects the persistence of students at small, private, enrollment driven institutions. The reality of multiple goals, unclear internal processes, and fluid participation makes students vulnerable with respect to being able to collect accurate information that inform future decisions. Institutions must consider the increasing environmental and organizational complexity that students must navigate and strive to maintain *organization* in the *anarchy* of their complex set of goals. It is crucial moving forward that researchers, scholars, faculty, staff, and other constituents of higher education understand the fundamental connection between organizational behaviors and student success. The two are inextricably linked and any story of institutional change should also involve the story of student success (or lack thereof).

Conceptual Model

Within the framework of organized anarchy, Berger and Milem (2000) provide a conceptual model for researching how organizations impact student outcomes. Their model controls for student entry (gender, ethnicity, academic achievement) and

organizational (size, selectivity, location) characteristics and looks beyond the typical two

dimensions of college life (academic, social) by adding a third vector—functional—that

accounts for all the non-academic and non-social, but still necessary, aspects of the

student experience. The authors write:

> While functional experiences may seem trivial at first glance, it is through these
>
> functional experiences that students interact with the organizational environment
>
> of the campus. Moreover, the extent to which students successfully negotiate
>
> these functional experiences and the extent to which they perceive that these
>
> experiences provide a supportive campus environment, the more likely functional
>
> experiences are to influence the quantity and quality of involvement that students
>
> have in social and academic aspects of college (p 319).

In the context of this research, the functional experiences that students have with respect

to financing their college education are closely connected with their academic and social

experiences, all three of which affect persistence decisions. Students with or without

small remaining financial need are less likely to make decisions that may have negative

consequences on persistence behaviors. Students that have large remaining needs may

start to re-consider their commitment to the university, potentially within the first few

weeks of their initial enrollment. They may also make decisions that have been linked to

lower rates of persistence, such as living off campus (Schudde, 2016) or working too

many hours at part (or full) time jobs (Titus, 2006b).

Another assertion of the Berger and Milem conceptual model is that student

outcomes, such as persistence, are influenced by both behaviors and *perceptions* of the

three dimensions of the college environment and that peer group characteristics have the

potential to mediate these relationships. Berger and Milem (2000) contend that, "The combination of individual characteristics of students at any one college or university creates a particular set of peer group characteristics that come together to form the peer climate of the institution" (p. 309). This concept of peer influence on student outcome is largely based on earlier theories developed by Astin (1993) and Weidman (1989) that focus primarily on the social and academic aspects of a student's experience (Titus, 2004).

Navigating the admissions process, turning in the required health center paperwork, completing the many steps necessary to receive financial assistance, and figuring out the varied options available to pay their student account are examples of the functional aspects of the student experience on a college campus. While students will not likely conceptualize their experience in terms of organizational theories (e.g. collegial, political, anarchical), there is research that suggests that student success has been linked to the extent to which students perceive that organizational decision making and functioning promotes communication, provides support, allows for participation, and is fair (Berger & Braxton 1998: Braxton & Brier, 1989; Milem & Berger, 1997;).

Potential student outcomes in the Berger and Milem conceptual model are based on Astin's typology (1970, 1991) and fall into a two-by-two matrix, with type of outcome (cognitive or affective) and type of data (psychological or behavioral) as the two dimensions. The cognitive behaviorial dimension (retention, graduation) outcome is most often the focus of research related to the impact of a student's financial realities (Mayhew, et al., 2016), although affective psychological (satisfaction, beliefs) outcomes

also have the potential to be impacted in significant ways due to the inconsistent student experience highlighted by the theory of organized anarchy.

Through the lens of this conceptual model, the remaining need of a student is part of the functional student experience and is personified in their interaction with the financial assistance office and business (accounts payable) office. At most small, private, enrollment driven institutions, this interaction begins shortly after a student is admitted to the institution and is facilitated by the admissions office. Almost all of these institutions have need-blind admissions policies in which students are admitted or denied based solely on academic variables. While a small number of need-blind institutions meet the full remaining need of admitted students, most are not able to meet the full need of students and require a practice known as "gapping" to meet their revenue goals. Gapping refers to the difference between financial aid offered (plus the expected family contribution) and the sticker price (Kiley, 2012).

Once a student is admitted, admissions counselors begin the process of discussing with students and their families their financial situations. Students that require additional aid beyond a merit-based scholarship that is offered as part of the admissions decision, complete the FAFSA (Free Application for Federal Student Aid) and receive a financial aid package from the financial assistance office. This letter includes anticipated institutional, state, and federal aid, including grants and loans. Only very recently have these award letters been mandated to include a standard format (Walter, 2019), which for years created significant confusion for students and families trying to make college enrollment decisions. Admissions counselors field initial financial aid related questions

from students and parents and refer more complicated questions to the financial assistance office.

Very early in this admissions/financial aid process, students' and their families' perceptions of the bureaucratic mechanisms (functional aspects) of an institution are formed. Many students easily navigate these mechanisms, often with a large degree of help from their parents, but others encounter situations that result in a negative perception of the bureaucratic functioning or organizational agents (staff). These perceptions can often lead to negative behavioral consequences, including enrolling at another institution or enrolling but carrying over their frustration into other aspects of their educational experience (academic, social) (Berger & Milem, 2000; Godwin & Markham, 1996).

It is through this functional lens of the Berger and Milem (2000) conceptual model that this single-institution quantitative study will examine the relationship between the remaining unmet financial need of students and their educational persistence at a small, private, enrollment driven university. The conceptual model allows for consideration of variables that often have high levels of collinearity with remaining need (academic achievement, race/ethnicity) and also considers the role that organizational behavior, student perceptions, and peer influence play in influencing student persistence.

Leadership Framework

Leadership at institutions of higher education almost always begins with a president. This individual is usually surrounded by some type of leadership team that consists of vice presidents, provosts, or deans. Traditionally, these presidential "cabinets" are composed of a representative from student affairs, academics, finance, enrollment, and development, along with at least one or two faculty representatives. This

cabinet establishes the priorities for the campus and works with the board of trustees to ensure success and sustainability of the institution.

This leadership "team" at an institutional level is similar to what Strand (2014) refers to as a Top Management Team, or TMT, of many corporations. This small group of executives is afforded the overall responsibility of the organization, and according to the "upper echelons theory" of Hambrick (2007), this relatively small group of people have a significant effect on organizational outcomes. Traditionally, most of the research that pertained to TMT's has been focused on the demographics of the individuals within the team. Recently, however, some of this research has shifted to reflect on the actual positions that constitute the TMT (Strand, 2014). This shift was recommended by Hambrick (2007), who wrote, "I have long thought there needs to be much more attention paid to the "structure" of TMT's, to complement—and improve—our understanding of TMT composition and processes."

Within the framework of a president's cabinet, institutions of higher education have often been accused of operating in "silos," where various departments and/or colleges are vertically articulated and focused primarily on serving their own internal agendas (Kuh, 1996). Academic departments, which serve a subset of the student population, can have various agendas and needs, which do not always align with the overall realities of the university. Student Affairs divisions, which serve all students within a university setting, often struggle for resources in this context, as departments across campus compete with each other for scarce resources (Keeling, Underhile, & Wall, 2007). Even within centralized institutional departments such as Student Affairs, professionals are often more likely to collaborate locally or regionally with others in

similar roles outside of their institution than they are likely to collaborate across departments within their home campus (Keeling, Underhile, & Wall, 2007). Therefore, it is essential that members of the presidential leadership team work collaboratively to ensure that any campus-wide initiatives are communicated clearly and are promoted across all levels and departments within a university setting.

Along with the president, two other groups play a prominent role at most colleges and universities: trustees and faculty. Trustees often sit at the very top of the organization chart and while members of this board are often volunteers that are removed from the day-to-day operations of the institutions, they are the final authority on all fiduciary and policy related matters. They are responsible for providing accountability to the administration, including the president, whom they select, evaluate, support, and ultimately remove if necessary. The impact of any decision that the board makes spreads throughout the campus by the president. It is essential for the president and the board to have a positive and productive working relationship in order for the university to function smoothly and for any positive change initiatives to occur (Eckel & Kezar, 2016).

Faculty have traditionally had a voice in institutional leadership via faculty senates or other formal groups. Faculty inclusion in university leadership is essential to protect the fidelity of the academic mission and faculty interest. While there is concern that faculty senates are losing some of their importance and power, due to the shrinking number of tenure track professors and increased emphasis by legislators on performance-based funding, the relationship between the faculty and the president will always be critical. It becomes quickly apparent when faculty and presidents clash and these examples of failed shared leadership often generate headlines and lead to faculty votes of

"no-confidence" in the president. This extreme situation, sometimes called the "nuclear option" requires the board to quickly step in and help facilitate some type of productive resolution (Eckel & Kezar, 2016).

Shared leadership among boards, presidents, and faculty can be perplexing at times due to environmental circumstances, fluid participation among members, and unclear or disputed lines of power and control. However, due to the increased rate of change within higher education, it is impossible for a single individual to understand the large number of issues that may face an institution. Colleges and universities will continue to have a large number of issues to grapple with and only within a model of shared leadership is it possible to effectively address these complex challenges (Eckel & Kezar, 2016).

With respect to how remaining unmet financial need influences student persistence, it is important for all areas of leadership within the university to understand the ramifications of enrolling students with significant remaining financial need. It is not simply a problem for the financial assistance office to deal with. Advancement divisions may need to increase their focus on fundraising for need based, endowed scholarships. Departments may need to reconsider policies or requirements that have significant financial ramifications for students. Residence life policies and procedures need to reflect an understanding on students' abilities to pay. Relying on the organized anarchy framework (with garbage can decision-making models) to make decisions is likely to negatively affect students with respect to this functional aspect of their college enrollment (Manning, 2018).

In the realm of higher education and in the context of the organized anarchy framework, shared leadership is a theory that shifts the perspective of leadership from a traditional top-down hierarchical framework to a perspective of leadership as a dynamic social process, where group members actively and intentionally shift the role of leader to one another as necessary due to the circumstances in which the group operates (Wassenaar & Pearce, 2012). With so many complex issues currently confronting higher education leaders (new technologies, racial/gender tensions on campus, declining budgets, adjunct faculty), the demand to empower multiple leaders across campus is becoming a necessary reality for institutions of higher education (Holcombe & Kezar, 2017).

Shared leadership (or collaborative leadership) helps maximize the contributions of many individuals in solving difficult problems. While recognizing the importance of leaders that hold positions of authority (i.e. president, vice president, dean), shared leadership focuses on how these leaders capitalize on expertise within the institution by delegating authority and creating appropriate infrastructure to maximize collaboration amount such experts (Holcombe & Kezar, 2017). Shared leadership is different from shared governance, which focuses more on the distinct areas of delegated authority and decision-making that faculty and administrators have. Shared leadership is more flexible and encourages multiple perspectives instead of a single decision-making body. So while departmental faculty may have ultimate authority over which classes are required for a particular major, shared leadership encourages participation from administration and other staff (admissions, financial aid, etc.) that bring varied perspectives to the discussion (Kezar & Holcombe, 2017).

The development of shared leadership theory can be partially traced to the writing of Hollander (1961), which delves into the idea that leaders can emerge or be selected by other members of a leaderless group. More recently, Yukl (2017) highlighted a similar message in his writings on cross-functional teams and the reality that most of these teams are temporary and cease to exist when their mission is completed. This understanding is crucial to complex organizations, such as colleges and universities that display the main tenants of organized anarchy, especially with respect to the principle of fluid participation. With so many individuals falling in and out of the decision-making process, shared leadership helps frame the idea that multiple leaders can and will emerge over time, depending on the needs and realities that an institution finds itself in.

Leadership at institutions of higher education have undergone major shifts regarding the way it is conceptualized over the past two decades (Liang, 2015). States and communities have called upon leaders at institutions of higher education to help form relationships that are mutually beneficial to both the institution and to the community through engaging the students in their larger communities (Liang, 2015). Particularly in higher education, no longer, if it ever was, is the traditional top-down, leader-centric view of leadership relevant.

It is also important to consider the role of power in shared leadership. In their seminal research on the bases of social power, French and Raven identify the five bases of power that influence individuals within organizations. Of these five bases (reward, coercion, legitimate, referent, and expert), legitimate power is arguably the most complex (1959). Within institutions of higher education that have many highly educated participants, with varied perspectives and motivations, legitimate power is often hard to

agree upon. Cultural influences and social structures both play a significant role in this base of power, as does designation by a legitimizing agent. French and Raven use the example of department heads at a university accepting the authority of a vice president in their area because this authority has been granted by the president of the university (1959, p. 160).

A second base of power that is especially important in university settings, in relation to the theory of the organized anarchy theory, is that of expert power, which is based on the perception that the leader has some type of special knowledge or expertise (French & Raven, 1959). With respect to the theory of shared leadership, where a large percentage of "followers" hold a terminal degree, it is imperative that leaders can convince others of their expert power.   While it is true that most of these followers are highly educated in a particular arena, such as biology or statistics, it does create an increased burden on university leadership to create a clear vision that these highly educated followers can fully support and integrate into a shared and collective purpose.

Regarding both legitimate and expert power, one potential way to help galvanize institution-wide support in the challenging setting of higher education, is to reference the ideas presented by Salancik and Pfeffer (1977) in their influential work concerning institutional authority. They argue that power is "in its most naked form, one of the few mechanisms available for aligning an organization with its own reality (p. 3)." They go on to say that when organizations decline, it's "not because they played politics, but because they failed to accommodate to the political realities they faced (p. 3)."   Using a more cynical tone, they maintain that leaders need to legitimate their own authority by diminishing the legitimacy of others (Salancik & Pfeffer, 1977).

These authors reference power sharing in higher education institutions as an activity that is necessitated by various desired outcomes. These outcomes are based on limited resources and no one person controls all of these preferred outcomes. Within the context of organized anarchy, the goals of the various university departments are often blurred and contested instead of clearly and universally agreed upon. Furthermore, they are rarely centered around abundant resources. Power is thus important to influence organizational decisions where resources are scarce or limited (Salancik & Pfeffer, 1977). In the research questions to be explored in this paper, there are many examples of limited resources that contribute to the relationship between students' remaining need and persistence, most importantly revenue dollars and the pool of potential students.

Kotter supports the importance of legitimate power within shared leadership by stressing that successful leaders must regularly involve other people (faculty and staff) in decision making and deciding how to achieve an organization's vision. At an institution of higher education, not only does this give faculty and staff a sense of control, but it also satisfies the need they have to feel valued and makes them feel as though the work they are doing is important to the success of the institution (Kotter, 2001). The primary goal of leadership, regardless of the sector, should be to create something that is greater than the sum of its parts. This means that leaders should avoid distracted purpose by creating conditions that encourage positive synergy toward a shared vision and putting people in positions that highlight their strengths and mitigate their weaknesses (Weinzimmer & McConoughey, 2013).

Summary

The role of power, influence, and shared leadership theory are all part of the contextual challenges present when investigating the influence of remaining unmet financial need on student persistence. Unmet remaining financial need is a function of many aspects of an institution's operation and ultimately often times comes down to budgetary considerations. Who "owns" the decisions surrounding institutional financial aid policies certainly involves power and influence on individual college campuses. How and by whom these decisions are made cannot be viewed separately from the impact they have on student success and the remaining unmet financial need of students. Once again, student success and organizational practices are closely related and this study hopes to shed light into one aspect of this intersection. Tinto (2012, p. 23) perhaps says it best when he writes: "Establishing an environment that provides students with a clear roadmap and high expectations for their success requires collaborative efforts of *all members* of an institution, especially the faculty."

It is not solely up to the leadership team at institutions to ensure a clear roadmap for student success. Leading from the middle is important and it is within these middle management positions where most relevant student information is gathered and either shared or not shared, both vertically and horizontally. In the realm of students remaining unmet financial need, the director of the financial assistance office could be empowered as part of a comprehensive organizational team and encouraged to provide RUFN data to a wide range of constituents across campus, along with gathering feedback from various groups.

Literature Review

The review of student retention/persistence literature begins with Tinto's theory of student departure, as his writings help inform the many reasons why students decide to stay or leave an institution. Secondly, it will briefly consider the between-college effects that inform persistence literature and while this quantitative study only includes data from a single institution, this background helps frame the research question and provides a background into policy that influences higher education writ large. Thirdly, the within-college effects will be summarized, including the academic and social aspects of a student's experience. Finally, and most germane to this study, the literature pertaining to the functional aspect of within-college effects will be highlighted and the role that financial assistance plays in student persistence will be broadly covered.

Student Departure Decision

Research into student retention and persistence (educational attainment) at postsecondary institutions in the United States almost without fail will at some point consider/mention Tinto's theory of student departure (Tinto, 2012; Tinto, 1987). The underlying premise of this theory is that pre-college student characteristics impact the levels of commitment to completing a degree at the institution where the student enrolls. These characteristics then lead to student experiences in the academic and social dimensions, which create a level of integration into the institution for each individual student. This level of social and academic integration then directly influences any departure decision a student may or may not make. Tinto has modified his theory to include students that integrate into one aspect of campus life (but not necessarily the entire campus) and how this can still serve as the positive integration mechanism that

increases a student's commitment to remaining enrolled at an institution (Mayhew, et al., 2016).

Tinto's almost-canonical theory of student departure, although frequently criticized (Museus, 2014; Tierney, 1992), shares many similar attributes with other alternative theories for college student departure. Tinto's and other student departure theories share an intersection of student characteristics and institutional traits that inform a student's decision to persist or depart by enlightening the student of the congruence or incongruence between this intersection (Mayhew, et al., 2016).

Between-College Effects

The between-college effects for educational attainment and persistence (does "college A" retain and graduate students at a significantly higher percentage than "college B"?) are often analyzed controlling for institutional selectivity and vary in magnitude throughout the literature. A meta-analysis of six related studies (involving a total of 11,482 students) exploring the relationship between institutional selectivity and retention found a bivariate correlation of .197 with around 2.46% of the observed variance accounted for by institutional selectivity (Robbins, et al., 2004). Additional studies, almost all done without controlling for measures related to student involvement, have found a positive effect of selectivity on graduation, even after controlling for a variety of student and institutional characteristics (Alon & Tienda, 2005; Chen & St. John, 2011; Schudde, 2016). On the surface, most of the findings would support the idea that students benefit from attending more selective institutions (Mayhew, et al., 2016).

However, when digging deeper into the hypothesis that persistence can be predicted using institutional selectivity, almost all studies that include measures of

campus involvement as a variable do not detect significant relationships between selectivity and persistence (Mayhew, et al., 2016). These findings have held true across multiple student characteristics that often interest researchers and policy makers, including first-generation college student status (Lohfink & Paulsen, 2005) and students' race/ethnicity (Alon & Tienda, 2005).

Another between-college relationship that has been analyzed recently on numerous occasions is effect of institutional expenditures on educational attainment (graduation) (Mayhew, et al., 2016). In one important study, Webber (2012) examined public universities in the state of Ohio and was one of the first researchers to look closely at how different expenditure categories (student services, instructional, academic support) impact subpopulations of students at various institutions. One of the conclusions from this study was that student service expenditures (outside the classroom resources such as tutoring, advising, programming) had a larger impact on students with lower standardized test scores while instructional expenditures (faculty salaries) were more important for students with higher test scores.

Additional research attempting to explain how institutional attributes (between-college effects) predict educational attainment have explored a variety of domains, including tuition, institutional racial/gender compositions, size, location, public vs. private, and state policy implications. A vast majority of these studies have found little to no significant relationship between any of these domains and educational attainment (Mayhew, et al., 2016). Tuition frequently receives a lot of public attention due to large increases over the past few decades (Martin, 2017; Seltzer, 2017) but most of the attention related to high tuition focuses on how it is a potential barrier to college

attendance, not its impact on measures of persistence. In fact, the research strongly suggests that tuition does not significantly affect measures of persistence for students already enrolled in college (Mayhew, et al., 2016). While this may be true, with the almost universal practice of tuition discounting (especially at private institutions), additional studies that explore the relationship between net price (how much students actually pay) and measures of persistence are crucial for both students and the institutions that recruit them.

Policy impacting between-college effects

Returning to the topic of performance-based funding explored in the introduction, many states have now implemented some type of policy that allocates the educational budget, at least in part, on one or more measures of institutional performance, most often graduation rates. The few studies that have explored this relationship have found that performance-based funding does not have the intended impact on institutional graduation rates that many politicians had in mind when implementing such policies (Shin, 2010; Tandberg & Hillman, 2014). If the intended benefits of performance-based funding policy that many states have implemented do not appear to manifest, are there other levers that state politicians can pull that have the potential to impact measures of institutional persistence? Titus (2009) scrutinized the impact that changes in state funding had on the number of bachelor's degrees awarded per enrolled student and concluded that increasing per-capita appropriations to higher education led to an increase in the number of degrees awarded.

This conclusion was supported by other researchers (Shin, 2010; Zhang, 2009) and much of the interest in the topic of state funding for higher education may have been

a response to significant cuts that resulted from the 2008 great recession. While the focus of most of this research is related to public institutions, it is important to consider one tangential aspect of state funding for higher education that may span across both the public and private sector of higher education: the amount of need-based aid appropriated per undergraduate student. When states are required to make cuts to balance their budget, it is no secret that funding for state colleges and universities is often viewed as a discretionary item (Zhang, 2009) or "balance wheel" (Titus, 2009) since institutions can theoretically simply raise tuition to help offset any loss in state appropriations. However, increasing tuition while holding need-based aid steady means that high need students will face greater amounts of remaining need, which is the variable of interest in this research.

Conceptual framework linkage

Almost all of the between-college conclusions are supported by Berger and Milem's conceptual framework (2000), which suggests that the relationship between institutions and student outcomes is mediated by student experiences. Said another way, most of the between-college effects are primarily explained by the within-college differences of students' experiences and perceptions ("student A" has a different experience/perception than "student B" at the same institution). This may help explain why finding significant between-college effects are rare in educational attainment and persistence research (Mayhew, et al., 2016).

Within-College Effects

An immense number of research studies have attempted to understand how variations within an institution affect student retention, persistence, and graduation. These studies can be organized into the three dimensions of college life identified in

Berger and Milem's theoretical framework (2000): academic, social, and functional dimensions. Within the academic realm, academic performance (grades), learning communities, experiences with faculty members and academic major are the dominant domains explored in the literature. For the social dimension, the largest domains are residence status, interactions with peers, and social integration. Third, within the functional domain, financial aid literature dominates the field and its impact on educational persistence and attainment may be "simultaneously more voluminous and more contradictory in its findings than for any other topic" (Mayhew, et al., 2016, p. 390).

The data set used for this study does not include any of the following academic/social intervention strategies that will be summarized. All students in the data set are required to take a first year seminar class and there is currently not any type of summer bridge program offered to incoming first year students. Additionally, first year students are assigned to a faculty member as their advisor and there is not any type of formalized, campus wide proactive advising offered to first year students. Even without the ability to control for these commonly used campus strategies, I felt it was important to summarize the literature surrounding their impact on student persistence. Additionally, it is important to note that none of the studies mentioned in the academic and social dimension control for the remaining unmet financial need of students. This is problematic and better and more comprehensive data sets need to be explored in the future that consider unmet financial need as a control variable.

Academic and Social Within-College Effects

Perhaps as a response to Tinto's theory of student departure, many studies over the past twenty years have focused on the level of students' academic and social integration. Three meta-analyses (Crede & Niehorster, 2011; Pan, 2010; Robbins, et al., 2004) have focused on the impact that various manifestations of student integration had on persistence. Crede & Niehorster (2011) used the Student Adaptation to College Questionnaire (Baker & Siryk, 1989) to directly measure students' levels of academic/social integration and found that higher levels of academic/social integration (even after controlling for precollege achievement) predicted higher levels of retention. While all of the studies used simple bivariate correlations between academic/social integration and persistence, their findings were very similar regarding the positive relationship between the two constructs.

Many colleges and universities have tried to intentionally create structures that promote students' academic and social integration. In a study of retention efforts at four-year colleges and universities, 73.7% of respondents surveyed said there was a person on campus that was responsible for the coordination of retention/persistence programs. However, within those institutions, there was little agreement on who was most responsible for retention, with the highest percentage (18%) saying a director was responsible (ACT, Inc. , 2010).

While there was little agreement about who is most responsible for student retention, the literature on best practices for promoting student retention is not nearly as discordant. Overwhelmingly, the research surrounding institutional academic and social initiatives to improve retention/persistence almost always centers on the freshman year

experience. In a report on student retention practices (Noel-Levitz, 2011), 93% of four-year private colleges have programs designed for first-year students and 84% of these institutions have mandatory one-on-one and face-to-face advising between first-year students and faculty. Additionally, the report highlights that 92% of four-year private colleges have an institution-wide emphasis that faculty teach first-year students, reinforcing the ideas presented in a 1984 National Institute of Education report, entitled *Involvement in Learning: Realizing the Potential of American Higher Education,* that recommended assigning the best faculty to teach introductory courses. This report also recommends providing more resources during the freshman year than the other three and redesigning courses for first-year students to increase interaction between instructors and students (National Institution of Education, 1984). With the freshman year as the primary focus of most retention research and practice, the three most common academic and social integration strategies for improving retention will be explored: first-year seminars, summer "bridge" programs, and proactive academic advising.

First-Year Seminars. Perhaps the most common academic integration initiative to help promote student retention is some type of first-year seminar or experience course. These courses are a popular way to help students integrate to campus life and help them succeed during this difficult transition from home. On some campuses, orientation activities continue as a credit course throughout the fall term (Noel, Levitz, Saluri, & Associates, 1985). This course often focuses on time-management, reading and writing skills, and other abilities that translate into improved academic performance and can be offered to specific groups of students or linked with other courses to form a "learning community" of students (Tinto, 2012).

Consistent evidence points to freshman seminars as being an effective retention strategy. At a medium-sized, regional four-year university, students who enrolled in a freshman-year experience course had a statistically significant higher rate of 2nd year retention than did those students who elected not to enroll in the course. The freshman seminar course was co-taught by a member of the faculty and an administrative staff member, which sent a clear message to current and potential students that the campus placed a high priority on the academic success of their students (Sidle & McReynolds, 2009).

Implementation of a first-year seminar is not an easy task due to the numerous logistical challenges, not the least of which is the reluctance of many institutions to give more than one credit for a course that is often seen as non-academic (Tinto, 2012). Partly due to this reason, many first-year seminar courses are being integrated into a common first-year academic class or structured as a curricular learning community (Friedman & Alexander, 2007). At the institution where the data for this research comes from, the first-year seminar class (entitled "Transitions") is required for all first-year students. The students are grouped into intentional "learning communities" for this Transitions class, meeting two times a week throughout the first eight weeks of the semester. The Transitions instructor is a faculty or staff member that is dedicated to helping students navigate the challenges they may face during their first semester of enrollment.

First-year seminars have even been found to be effective when enrollment numbers are increasing and instructional resources are declining. In the College of Agricultural and Life Sciences at the University of Wisconsin-Madison, enrollment rose 30% over three years (2009-2012) while instructional resources declined by more than

5%. In a study comparing students who took a first-year seminar course within the college and those that did not, higher retention rates were reported, as well as various other academic success indicators, such as first-term grade point average and shorter time to degree (Klatt & Ray, 2014).

Despite the overwhelming number of institutions that use first-year seminars as a way to help promote student retention, some researchers have questioned their role in higher education, especially when they are designed around a theme meant to appeal to a large number of first-year students (Hickinbottom-Brawn & Burns, 2015). Seminars entitled "The Real CSI" and "Social Problems in Cinema" focus on a particular topic, while also attempting to help train students with a number of skills necessary for high academic achievement, such as time-management, study skills, and interpersonal communication. Critics of such theme-based seminars, while admiring efforts to pique student interest, suggest a need to consider what these institutions are trying to achieve (Hickinbottom-Brawn & Burns, 2015).

Summer "Bridge" Programs. Another common institutional retention strategy is the implementation of summer bridge programs. These transitional programs, also called "pipeline programs," range in form from basic early intervention programs to more all-inclusive summer sessions designed to help students transition successfully from high school to college. These programs almost always focus heavily on the academic skills necessary to succeed as a college student but can also incorporate a focus on non-cognitive factors and the "soft-skills" often associated with college success, such as time-management and interpersonal communication (Slade, Eatmon, Staley, & Dixon, 2015).

These programs have been popular on college campuses in the past three decades, with the goal of providing new students with increased opportunities to learn about student activities on campus, meet informally with faculty in a non-classroom environment, and acclimate students with expected behaviors and regulations (Pascarell, Terenzini, & Wolfe, 1986). Even with this long history of helping students retain and graduate, summer bridge programs are continuing to gain attention as student retention strategies. To illustrate this point, the University of North Carolina's 2013 Strategic Direction publication (2013) highlights the expansion of the summer bridge program as one of its main strategies to increase student retention by the year 2018, with a goal of increasing participation by 100%.

While summer bridge programs vary in the programmatic components and implementation, most are aimed at helping traditionally underserved populations, such as first-generation college students, acclimate to campus resources and gain exposure to college course expectations. At the University of Arizona's New Start Summer Program (NSSP), evidence has shown that students who participated in the NSSP program retained at significantly higher rates than those students who did not (Cabrera, Miner, & Milem, 2013).

Some summer bridge programs are a requirement for students whom otherwise would not be admitted to a university. Other summer bridge programs are recommended for students who show potential but may be borderline for academic or social readiness. At Columbia College in Chicago, students are oriented to the overall mission of the institution through a series of summer writing courses. While this four-week bridge program showed that students who completed the program were retained in greater

numbers than at-risk students who did not attend the program, the long-term success of these students diminishes after the first year (McCurrie, 2009).

At Georgia Tech, a summer program called the "Challenge Program" aims to serve traditionally under-represented students in the field of engineering. Focusing primarily on minority students and women, first-year students that attend the program start at the end of June and continue through the end of July. While the academic component of the program is meant to reflect coursework in calculus, computer science, and other important courses, time-management and discipline are also addressed within the program. Students who fail to meet rigorous behavioral and social standards within the program are sent home. As with many other bridge programs, the outcomes of the Georgia Tech "Challenge Program" show that even after controlling for demographic and academic characteristics, students that are enrolled in this summer program have a higher likelihood of graduation than those who did not participate (Murphy, Gaughan, Hume, & Moore, 2010).

Proactive Advising. Along with first-year seminar courses and summer programs, academic advising practices have commonly been highlighted in literature as an additional way to help increase retention rates. Students that receive proper advising are more likely to retain to future semesters and progress towards graduation, while also enjoying the classes in which they are enrolled. Traditionally, an academic advisor's main job is to help students determine a major and select courses that will progress them toward meeting the requirements of graduation. While the most common questions that advisors help students with are related to what courses they will take in upcoming semesters, increasingly, advisors are also required to help students deal with personal

issues outside the classroom, help resolve conflicts that students have with faculty members, and be knowledgeable about on-campus resources, such as the career center or tutoring (Khalil & Williamson, 2014).

A new phenomenon, known as proactive or intrusive advising, has replaced the more passive concept of academic advising for some institutions. At a public, large-sized institution in the Midwest, a PLUSS advising initiative was instituted for science, technology, engineering, and math (STEM) majors due to low retention and graduation rates. This advising model used extensive advisor training and a low student-advisor ratio to help facilitate numerous one-on-one advising sessions throughout the semester. Furthermore, the advisors would help students navigate the time-management aspect of college life, and the advising structure was linked with a first-year seminar course taught by the PLUSS advisors that helped students succeed within the STEM major (Rodgers, Blunt, & Trible, 2014).

Ideally, advisors help students access some type of clearly defined roadmap for the requirements necessary to earn a degree in their field of study. Moreover, advisors become crucial when students change their major, and it is estimated that between a third and a half of all students at four-year colleges will change their major at least once (Tinto, 2012). Some intrusive advising programs have differentiated between high-risk students, particularly those on academic probation, and the more traditional students (Vander Schee, 2007). These intrusive advising models for at-risk student populations focus on personal contact and consider factors other than just academic variables that influence a student's overall success in college. This model has been shown to have a

positive effect on academic achievement as determined by GPA fluctuations (Vander Schee, 2007).

Academic advising structures vary within institutions of higher education. Conventionally, larger universities employ a number of professional advisors, especially for first and second-year students, while smaller institutions use primarily faculty advisors. Often, academic advising is a decentralized system where advisors are provided with little incentive to serve as academic advisors (Chiteng Kot, 2014). With an increased focus on student retention, some colleges and universities have expanded advising services and attempted to increase the quality of these services. In fact, the number of higher education institutions with a dedicated advising center increased from 14% in 1979 to over 73% in 2003 (Habley, 2004).

At the institution under study, academic advisors are primarily faculty members who are not incentivized or loaded for their role as an advisor. This university uses an advising strategy that limits the number of credits at-risk students are allowed to take during their first year, particularly during their first semester. The rationale behind limiting the number of credits students can take is to help students with the transition to the more rigorous academic expectations of college by providing them with a manageable course load. In the past, this advising structure has been questioned. In a study investigating course load, Szafran (2001) found that no relationship exists between academic load, pre-enrollment success, and first-year success. Regardless, academic advising plays a large role in helping students retain and succeed at almost all institutions of higher education. However, once again, these studies rarely, if ever, control for remaining financial unmet need of students.

Functional Within-College Effects

The third dimension of Berger and Milem's student experience framework is the functional dimension and as previously stated, is conceptualized as "experiences that students have in college that are neither academic nor social, but are necessary forms of participation in campus life (p. 319)." Overall, less attention has been devoted in the research literature on how the student experience, including persistence and attainment data, is mediated by these functional experiences (Berger & Milem, 2000). However, as previously mentioned, inside of this functional context is a plethora of research on how financial aid impacts student persistence and attainment (Mayhew, et al., 2016).

Student Financial Aid

In order to understand the types of financial aid that are available to students, it is important to consider the various ways that institutions of higher education are funded. The most obvious difference in funding mechanisms is between public and private colleges and universities, although some researchers have argued that the public/private distinction is not meaningful in any real sense for most students due to the direct or indirect dependence on governments for tax credits, tax exemptions, and student grants and loans (Vedder, 2018). State governments spent $91.5 billion supporting higher education in the 2018-19 fiscal year, with a majority of the funding going to large, public 4-year universities and community colleges (Toppo, 2019). Prior to 1993, the majority of state funding to public colleges and universities was in the form of uniform subsidizes (or block grants) given to designated public institutions or in the form of need-based financial aid given to students. With the introduction of the HOPE (Helping Outstanding Pupils Educationally) scholarship in Georgia, quite a few states started shifting some of

their funding to merit aid programs. This scholarship required students to earn a 3.0 high school GPA and was implemented to help incentivize students to perform well in high school and help keep the brightest students enrolled at in-state institutions, preventing "brain drain" from the state of Georgia. By the end of 2010, almost a third of all states had some type of merit aid program (Toutkoushian & Paulsen, 2016).

State support for higher education has slipped over the past thirty years and has been a popular topic in the press (Seltzer, 2018; Toppo, 2019; Wyllie, 2018). Only two states (Wyoming and North Dakota) have maintained their fiscal commitment to higher education and some states have reduced their commitment by over greater than 50%. The state with the largest decline between 1980 and 2011 was Colorado, with an almost 70% reduction in state support for higher education (Mortenson, 2012). More recently, a report by the Center of Budget and Policy Priorities (CBPP) analyzed state spending on public colleges and universities since the 2008 Great Recession. After adjusting for inflation, overall state funding was more than $7 billion below its 2008 level and Colorado had a 9% decline since 2008 (Mitchell, Leachman, Masterson, & Waxman, 2018).

Some would argue the claim that higher education has faced declining support from state governments over the past thirty years. In a New York Times opinion piece, law professor Paul F. Campos (2015) writes that state appropriations were at an inflation-adjusted record of $86.6 billion in 2009, and claims by university leaders that raises in tuition are a result of declining state support are dubious. Instead, he and others blame tuition increases primarily on the expansion of university administration, which has

grown by 60% since 1993 (Belkin & Thurm, 2012; Campos, 2015; Harlan Reynolds, 2014).

The most obvious way that institutions can make up for decreases in state monies (and more administrators) is to increase tuition/fees. In 2009-10, in order to make up for a large deficit in funding caused by the Great Recession, public four-year colleges posted a 9.5% increase in tuition and fees, and 2-year public institutions posted a 10.2% increase (Seltzer, 2017). Another obvious way that institutions can increase revenue is to increase overall enrollment in traditional programs or expand their offerings to include graduate, non-traditional, or niche programs, such as certification and non-degree options. Increasing enrollment is harder to accomplish in the short term, due to demographic constraints (less traditional aged students) and increased costs associated with expanding programs (mission creep) (Jenkins, 2014).

Higher education's response to needing more revenue has also led to an interesting, less obvious, dynamic for many public 4-year institutions, including flagship universities. This dynamic is the percentage of in-state vs. out-of-state students. From an economics point of view, incentivizing the best and brightest students to remain in state for college is a desirable proposition for the state, due to the numerous public benefits that higher education provides, often referred to as "positive externalities." States are most easily able to do this by providing uniform merit-based scholarships to high achieving high school students who enroll in one of the public universities in the state. While much easier to administer and politically appealing for many policy makers, this type of merit-based state support potentially takes away increased funding opportunities for students with higher levels of need (Toutkoushian & Paulsen, 2016).

At many public universities around the country, the percentage of in-state vs. out-of-state students has shifted, with increasingly large percentages of the student body being made up of out-of-state students. Eleven flagship universities have a larger percentage of freshman from out-of-state than they do from in-state. Many prestigious, public flagships are prioritizing wealthy, out-of-state students over low-income, yet highly qualified in-state students. Other less prestigious flagship universities are targeting out-of-state applicants that have been denied by their in-state university, often because they can afford to attend at much higher rates of tuition. Students that come from out-of-state often have tuition charges that are $20,000 or more higher per year than their in-state counterparts (Jaquette, 2017). Again referencing Colorado, the state with the largest decrease in state funding for higher education since 1980, approximately 34% of the total student enrollment at CU-Boulder were from out-of-state in 2008 but that percentage jumped to almost 42% by the year 2018. Was this increase in out-of-state students a financial necessity for CU Boulder or a strategy to attract more "top-quality students" from across the country (Eason, 2019)?

Private Institutions

Private institutions rely on a combination of tuition, endowments, donations, and auxiliary revenues (room/board) to fund their operational costs (Public vs. Private Colleges, 2019). Their tuition is the same for in-state and out-of-state students, since they do not receive direct subsidies from state governments, although some states do provide portable tuition vouchers for students to attend state private institutions (Virginia Tuition Assistance Grant, 2019). At non-elite private institutions, most without an endowment large enough to fund students that are unable to pay their share of tuition, tuition

discounting has become the primary strategy for meeting enrollment and revenue goals.

This strategy is a form of price-discrimination, where students that are able (and willing)

to pay more in tuition are charged more than their less wealthy classmates, leading to

largely unfunded tuition discounts (Wong, 2017). At some institutions, there are virtually

no students that pay the sticker price of tuition (Rine, 2016). While this type of price

discrimination is similar to public colleges charging higher rates for out-of-state students,

the main difference is that at most private institutions there is not replacement of the

discounted tuition, whereas public institutions have state subsidies to supplement lower

tuition from in-state students (Toutkoushian & Paulsen, 2016).

There are two overarching problems with the economics of financing small,

private institutions of higher education that have become a stark reality for many

institutions. The first is the economies of scale. Two leading experts on higher education

economics estimated that efficiency and productivity can be maximized at an enrollment

level up to around 24,000 students. For smaller colleges, this means that higher education

services could be delivered at a total lower cost if smaller institutions merged into larger

ones (Toutkoushian & Paulsen, 2016). Unfortunately, these savings are often not as large

as expected due to complexities created by the merger of institutions. There are a number

of features any institution must have in order to retain accreditation and legitimacy.

While you may only need one financial aid director if two schools merge, the number of

staff positions is unlikely to decrease by 50%, if at all. A final argument against the idea

of economies of scale is that large universities are not always in the best interest of all

students (Toutkoushian & Paulsen, 2016).

The second economic problem that small, private colleges and universities face is that of how outputs in higher education are measured. If two institutions enroll the same number of students, how do we know which university did a better job at "educating" these students? Even controlling for the incoming student attributes, with what outputs should the consumer be most concerned? Job placement rates? Average starting salary? Largest gains in learning, as measured by standardized tests? This conundrum is not a new phenomenon but the recent public and political outcry regarding tuition increases and rising student debt have put the pressure on institutions to justify their costs. For private colleges and universities, leaders need to continually justify why students should pay considerably more to attend their institution than a community college or state public institution. Without clear and undisputed evidence that private institutions have better outcomes, many students and their families are choosing to attend cheaper, public colleges and universities.

Student Financing

Regardless of what educational sector (private/public/for profit) a student chooses to attend, there are multiple ways that they can pay for their education. Student's finance their college education in a variety of ways, ranging from parent's savings plans, to state grants, to federal and private loans. In 2011-12, almost 40% of all undergraduate student financial aid was in the form of federal Stafford loans, or federal Direct loans as they are currently known (Nowicki & US Government Accountability, 2014). These loans come in two different forms, subsidized (interest does not accrue while enrolled) and unsubsidized (interest starts accruing while enrolled). Students must demonstrate financial need to qualify for the subsidized loan program. The latest increase in the loan

limit of the federal Direct loan program occurred during the 2008-09 school year, when the combined total of the loans jumped from $2625 to $5500 for a dependent student in their first year (Nowicki & US Government Accountability, 2014).

Accessibility to post-secondary education is a common theme in the literature over the past number of years. Reports of an impending or current student loan crisis are also common and articles often cite data that show student loans are the second largest source of debt in the United States (Hopkins & Pustizzi, 2014). Additionally, the fact that tuition usually increases faster than inflation leaves many wondering about the sustainability of how higher education is currently being funded (Gianneschi & Pingel, 2014). The problem of how students will access (or afford) post-secondary education is an issue that will be contemplated for years to come.

A concern with any increase in student loan limits is that institutions of higher education will simply raise their prices to match the increase amount. This idea is commonly known as the Bennett Hypothesis, which stems from a New York Times op-ed (Bennett, 1987), where then Secretary of the Education Department William Bennett wrote:

> If anything, increases in financial aid in recent years have enabled colleges and universities blithely to raise their tuitions, confident that Federal loan subsidies would help cushion the increase. In 1978, subsidies became available to greatly expanded number of students. In 1980, college tuitions began rising year after year at a rate that exceed inflation. Federal student policies do not cause college price inflation, but there is little doubt that they help make it possible (p. 31).

This hypothesis was the primary focus of a report by the United States Government Accountability Office in 2014.   The conclusion of this report was that although college prices went up following the 2008-09 loan limit increase, "we were unable to determine whether or not these increases resulted from the loan limit increases because of the interference of various economic factors occurring around the same time these loan limit increase went into effect" (Nowicki & US Government Accountability, 2014, p 13). Of course, many of these economic factors were created by the 2008 national recession.

One question often raised regarding student loans is how much money the government is making off the interest that is being charged. According to the official estimate by the Government Accountability Office, the federal student loan program could make around $1.6 billion dollars in 2016, although it cautions that this estimate is an extremely tricky and complex formula and if adjusted to include more students falling behind on payments or defaulting, the loan program could actually lose up to $20.6 billion dollars in 2016 (Lobosco, 2016). According to another source, the federal government made $41.3 billion dollars in 2013, which was a higher profit than all but two companies in the world during that year, Apple and Exxon (Jesse, 2013).

Undergraduate student loans almost always lose money for the government due to their low interest rates while graduate and parent plus loans make money (Lobosco, 2016). A report by the Dept. of Education shows that 41% of all undergraduate students take out federal loans, which was an increase of over 6% from four years previous (Jesse, 2013). In 2013, Congress passed a law that based student loan interest rates to the 10-year Treasury Rate but allowed rates to change every year. For undergraduate loans, the rate is the Treasury Rate plus 2.05% while the Graduate loan rate is Treasury Rate plus

3.6% and the parent loan rate is Treasury Rate plus 4.6%. While proponents of this new law say that the rate changes will help keep college affordable, critics point out that the government is still expected to make over $175 billion from student loans over the next decade (Jesse, 2013).

Federal Pell Grant

The Federal Pell Grant is often considered the foundation of a student's financial aid package and is limited to undergraduate students with demonstrated financial need (Federal Student Aid, 2018). As higher education is managed by states and not the federal government, providing this need-based grant is one important lever that the federal government has to encourage more students to receive an education beyond high school (Toutkoushian & Paulsen, 2016). There are additional federal and state grant programs available to help low-income students attend college and many universities provide institutional financial aid to help students, including many public colleges (Hillman, 2010).

The Pell Grant program has grown considerably over the past twenty years and its total expenditures are now approximately $35 billion a year. This program now serves more than nine million students, up from four million at the turn of the century. These increases have led many critics to argue that the costs of the Pell program are "out of hand" and some have even compared students receiving Pell grants to "welfare recipients." Anecdotal stories of students who bounce around from college to college and enroll just long enough to receive a Pell Grant refund (Field, 2011) or Pell grant recipients driving a fancy Corvette during a spring break trip to Florida (Goldrick-Rab, 2016) have led to many criticisms of the program. In reality, based on a report by the US

Department of Education's Office of the Inspector General, only around 0.02 percent of

Pell grant funds were considered a fraud loss (Goldrick-Rab, 2016).

      The critics and media coverage of Pell Grants have obscured the fact that the

actual purchasing power of the Pell Grant has declined over the past quarter century, as

increases have not kept pace with the actual cost of college attendance. In order to help

cover the costs of their education, students have looked to states and institutions

themselves to help cover their remaining costs. State need-based aid took a substantial

hit during the 2008 recession and has yet to recover to pre-recession levels (Goldrick-

Rab, 2016). In order to help students enroll and persist, many colleges and universities

increased their need-based aid, which has fueled another phenomenon in higher

education: increasing tuition discount rates (Valbrun, Tuition Conundrum, 2018).

      Research exploring the relationship between Pell Grants and measures of student

persistent has been scant due to difficulty in obtaining accurate data on Pell Grant

recipients (Bettinger, 2004). Recently, IPEDS (Integrated Postsecondary Education Data

System) updated their data set to include retention and graduation rates for Pell Grant

recipients. Even though the 2008 Higher Education Act required colleges and

universities to disclose Pell graduation rates upon request, some colleges were unable or

unwilling to disclose this data until the recent IPEDS update. In an analysis of this long

awaited data, limited to four-year colleges and universities with at least fifty students in

each category (Pell recipients and Non-Pell recipients), the average six-year graduation

rate of Pell recipients was 51.4%, compared to 59.2% for non-Pell recipients (Kelchen,

2017).

This analysis did not control for any of the predictors that are commonly linked to measures of persistence, such as academic variables or levels of social integration. However, it did show a striking gap between Pell/Non-Pell graduation rates for many institutions, with one university showing a remarkable 89.5% difference between the Non-Pell graduation rate (92.2%) and the Pell graduation rate (2.7%) (Kelchen, 2017). Unless there was an error in the submission of this data, this raises serious questions of equity within institutions that have large Pell/Non-Pell graduation gaps, regardless of the collinearity between the receipt of a Pell Grant and other variables related to decreased likelihood of graduation. At the institution highlighted in this case study research, the Pell/Non-Pell graduation gap was 24.1% in 2017, the highest gap among peer institutions located in its region (Kelchen, 2019).

Additional studies exploring the relationship between Pell-Grant and Non-Pell Grant recipients and measures of student attainment are likely to increase over the next decade, as interest in higher education's role in promoting social equity continues to be a topic of interest for educators, policymakers, and researchers (Bettinger, 2015; Goldrick-Rab, 2016; Mayhew, et al., 2016). The most pertinent type of research related to Pell Grants may be their role in reducing the remaining (unmet) need, as research has consistently found that unmet need predicts lower levels of persistence, even when controlling for various other factors. Additional research into this topic is needed and may yield crucial findings related to measures of student persistence and attainment (Mayhew, et al., 2016).

Grants/Scholarships/Loans

Outside of Pell Grants, many states and institutions provide scholarships and other forms of grants (financial aid that does not have to be repaid) to both encourage students to attend their particular institution and to promote persistence once the student enrolls. Some research has been conducted to compare the effectiveness of grants/scholarships versus loans in promoting persistence. While the evidence is ambiguous, there does appear to be limited support that grants/scholarships are more effective than loans in regards to measures of persistence. Several studies explored this issue by examining the outcomes of several debt-reduction programs that replaced loans with need-based grants for students and found that replacing loans with debts reduced the likelihood of students leaving college, especially when the students' unmet need is low (Mayhew, et al., 2016).

At least one noted researcher on student financial aid cautions that research on providing additional grant aid and its effect on student outcomes is not as straightforward as it may appear. Sara Goldrick-Rab studied the Wisconsin Scholars Grant program, which provided up to $3500 per year for students that were eligible due to financial need. This program used a lottery system to select students to be a part of the program and many eligible students were not selected. As such, this study provided similar comparison groups for students that were awarded the grant and students that were not. While the results showed a significant increase in second year retention rates, there were not any statistically significant differences in four-year graduation rates between the groups (Goldrick-Rab, 2016). Godrick-Rab writes, "The important lesson this experiment taught us is that financial aid is not money….unlike cash gifts or wages, the

grants and loans that make up financial aid include complex rules, procedures, and requirements (p. 231)."

Free Application for Federal Student Aid

At the most basic level, some studies have simply explored the relationship of applying for financial aid and its impact on educational attainment. Several of these studies have found that there is a positive relationship between applying for aid (completing the Free Application for Federal Student Aid (FAFSA)) and measures of persistence. These studies have faced considerable scrutiny however, as the multicollinearity of applying for aid and other difficult to measure variables (cultural capital, intrinsic motivation, etc.) may be quite high. Said more succinctly, students that apply for financial aid may already have a greater chance at remaining in school than those that do not (Mayhew, et al., 2016).

This conclusion may not hold true for many small, private institutions with high tuition. At these institutions, many "non-filers" (students that do not complete the FAFSA) are considered financially lower risk due of the level of personalized financial aid counseling that is provided to admitted students and their parents. Students that do not file generally have families that understand that they will not qualify for need-based aid and therefore do not waste their time completing the FAFSA. At these institutions, it is likely that applying for financial aid indicates larger levels of remaining need, which as previously mentioned, consistently predicts lower levels of persistence.

Unmet Need Research

There have been some attempts to isolate the effect that remaining unmet need has on measures of students persistence and the research has consistently demonstrated

that unmet need predicts greater student departure patterns and lower levels of

educational attainment (Mayhew, et al., 2016). Bresciani and Carson (2002) found that

the level of unmet need is more predictive for a student's ability to persist than the

percentage of gift aid (defined as all sources of grants and scholarships as a proportion of

total student cost of attendance). Herzog (2005) found that unmet need impacted students

differently depending on their families income level, with upper and lower-level incomes

being relatively unaffected by unmet need, while middle-income students with greater

levels of unmet need faced twice the risk of dropping out during their first semester of

enrollment. A study of undergraduate students in Michigan found that moderate unmet

need did not influence retention rates but extreme levels of unmet need (greater than

$12,000) clearly led to lower levels of retention (Ternes, 2017). On the other hand, at

least one study determined that after controlling for numerous other factors, persistence

was unrelated to unmet financial need (Titus, 2006a). However, the definition of unmet

need is not clearly articulated in this research study, which has been cited as an important

definition due to the various interpretations of this variable that exist in the literature

(Goldrick-Rab, 2016).

The Titus study (2006a) attempts to add an interesting additional layer of control

to studying the relationship between student characteristics and measures of persistence,

the percentage of an institution's budget that is tuition dependent. This study uses

resource dependency theory and draws from the Berger-Milem (2000) conceptual model

to reveal that after controlling for student predictors, student persistence is positively

influenced by the tuition dependency of an institution. The author highlights the reality

that many institutions have increased their focus on retaining students as public funds

(state appropriations) have declined, leading to increased dependency on tuition as a source of revenue (Titus, 2006a). While most of the schools in this study were public institutions, replicating a similar study using only private, tuition dependent institutions could yield informative conclusions.

Linking Finances to College Attendance and Retention

Retention and persistence research that use various measures of financial aid as a student level variable have increasingly highlighted the influence that financial support has in college attendance and college choice (Herzog, 2005). While this is not a new line of research, numerous studies over the past fifteen years have looked at the relationship between financial aid and the enrollment of students (Farrell, 2005; Horn, Peter, & Carroll, 2003; Potter, 2003; Turkel, 2006). These studies generally show a positive relationship between financial aid and college attendance, regardless of institutional differences. This is in contrast to retention outcomes that are not nearly as consistent due to variations in model specifications and institutional differences (Herzog, 2005).

The confluence of numerous retention and college attendance studies, decreased public financial support leading to increased institutional reliance on tuition, and the release of standardized college outcome information has led to an explosion of interest in student access and persistence. This level of unprecedented access to data has begun to create transformational change in higher education and leaders are increasingly focused on helping students attain degree completion. The efforts of colleges and universities to improve student success (earning a degree), while balancing the importance of diversity, equity, and inclusion, may well be the defining characteristic that our generation of higher education leaders will be evaluated on (Gagliardi & Wilkinson, 2017).

On the surface, institutional efforts to improve student retention and college attendance are a win-win proposition for both the institution and the student. In fact, much of the impetus for politicians and government leaders to establish indicators of institutional performance is to hold institutions accountable for helping enrolled students graduate with degrees that lead to gainful employment (Herzog, 2005; U.S. Department of Education, 2015). However, there are concerns that an increased focus (with potential funding consequences) on institutional rates of persistence could impact both student accessibility and affordability.

A striking example of how this intersection of student and institutional financial realities affects accessibility and affordability within higher education is found in a recent New York Times opinion piece by Jaquette and Salazar (2018). With an increased reliance on tuition as a source of revenue and pressure from the public to improve student outcome measures, some institutions are unintentionally (or intentionally) employing enrollment strategies that cannot be considered equitable or fair. Many colleges and universities are very intentional about the profile of students they recruit. This article provides data to show that both private and public institutions recruit at richer and whiter schools, regardless of the academic achievement of the students at the school. Can institutions of higher education really claim to want to enroll the best and brightest minds if their recruitment strategies suggest they are more concerned with enrolling the richest and whitest minds (Jaquette & Salazar, 2018)?

Chapter Summary

Chapter 2 summarized the theoretical, conceptual, and leadership frameworks used to contextualize this research and provided a literature review of student persistence

research. Organized anarchy is the theoretical approach that provides a foundation for exploring how RUFN affects student persistence. Berger and Milem's conceptual model highlights the functional aspects of a student's experience and the role they have in student success. Shared leadership theory compliments the organized anarchy framework and establishes the importance of a collaborative approach to decision making within a university setting in regards to students financial realities. The literature review focused primarily on within-college effects and their impact on student persistence. The upcoming methodology section describes the research design, sample, data collection, and variables used. It ends with pre-analysis descriptive statistics exploring the relationship between some of the variables.

Chapter 3-Methodology

This research was conducted using data from a single institution. While the results will not be generalizable across the field of higher education, or even with the sector of private, non-profit institutions, the researcher is interested in helping facilitate consideration of a larger topic or issue. The purpose of this particular study was to explore the relationship between remaining financial need of students and their educational persistence at a small, private, religiously affiliated liberal arts university in the southeastern United States. In this particular study, the researcher was examining remaining unmet financial need data to provide insights into a larger phenomenon and potentially reconsider generalizations about student retention and persistence. The institution itself was of interest and its data was examined in depth but it also played a supporting role in helping to understand the larger issue of how student finance affects measures of persistence in higher education. While reports and research often do not fit neatly into categories, this study can best be conceptualized as a single-institution quantitative study.

The research design for this study was based on Berger and Milem's theoretical framework (2000), which includes three different dimensions of the student experience: academic, social, and functional. Financial assistance is considered to be part of the functional experience and theoretically influences various types of student outcomes, including cognitive-behavioral outcomes such as persistence and graduation. In this functional context, the remaining unmet financial need of students and its relationship to educational persistence was explored and analyzed. The study asks the following four research questions:

1. To what extent do models that include only demographic control variables predict persistence into the 3rd and 5th semesters of enrollment? It was hypothesized that none of the demographic control variables would have statistically significant odds ratios associated with them and would not influence persistence into either the 3rd or 5th semesters of enrollment.

2. To what extent does high school grade point average (HSGPA) add to the models that include demographic control variables when predicting the outcomes (persistence into 3rd and 5th semester)? It was hypothesized that there would be a statistically significant odds ratio associated with HSGPA and that students with higher high school GPA's would persist into both the 2nd fall and 3rd fall at higher rates, even after controlling for entry year, race, and gender.

3. To what extent does remaining unmet financial need (as a continuous variable) add to the models that include HSGPA and demographic control variable when predicting the outcomes (persistence into 3rd and 5th semester)? It was hypothesized that there would be a statistically significant odds ratio associated with remaining unmet financial need (RUFN as a continuous variable) and that students with higher RUFN's would persist into both the 2nd fall and 3rd fall at lower rates, controlling for HSGPA, entry year, race, and gender.

4. To what extent does remaining unmet financial need (as a dichotomous grouping variable) add to the models that include HSGPA and demographic control variable when predicting the outcomes (persistence into 3rd and 5th semester)? It was hypothesized that there would be a statistically significant odds ratio associated with

remaining unmet financial need (RUFN as a dichotomous variable) and that students in the higher RUFN group (> \$5700) would persist into both the 2nd fall and 3rd fall at lower rates that the lower RUFN group (< \$5700), controlling for HSGPA, entry year, race, and gender.

Sample

Traditional fall first-time-in-college (FTIC) cohorts were used in this study. These cohorts were classified based on their year of entry (the 2012 cohort began their college experience in August of 2012). All students in this study were considered full-time students when they began their college experience (enrolled in 12 or more credits). Students that were part of these FTIC cohorts are traditionally entering college straight from high school but there may have been some students that took a gap-year or had other reasons for delaying college. There were six years' worth of FTIC cohorts in the study, starting with the 2012 cohort and ending with the 2017 cohort. Students that were not eligible to receive federal or state financial assistance were excluded from this study. These students were primarily international students. This exclusion is consistent with Integrated Postsecondary Education Data System (IPEDS) data collection. Persistence data was also included in the data set and students' fall registrations were used to determine if students were enrolled at the university on the census date during their third semester (2nd fall) and fifth semester (3rd fall). The census date was the 10th day of the semester each fall. It was possible that students withdrew during a semester and then re-enrolled during a future semester.

This sample was consistent with cohort data that the IPEDS collects and makes available to the public for a variety of research and governmental purposes (IPEDS,

2019). Transfer students and new students starting in the spring semester were not used in this study as a way to produce results that, while not generalizable to all institutions of higher education, can be used to help reconsider prior assumptions of student retention and persistence.

Data Collection

The institutional research (IR) and financial assistance offices at the university highlighted in the study provided the data set. All of the data was considered secondary data, as it had already been collected and used for other reporting purposes. IRB approval was obtained from both James Madison University and the institution used in the study.

The IR office supplied a dataset from six consecutive years (2012 to 2017) of traditional first-time-in-college (FTIC) fall cohorts. Demographic variables that were included in the data set were race/ethnicity, gender, and incoming cohort year. Students' high school GPA were also included in the dataset as a variable. The financial assistance office provided the IR office with the remaining financial need for each of the students included in the dataset. The IR office then de-identified the individual students by removing the student ID number and name from the dataset before sending it to the researcher.

<div align="center">

Variables

</div>

In this quantitative study design, the following variables were used in the analysis.

Independent variables

The two independent variables used in this study were high school grade point average (HSGPA) and the amount of remaining unmet financial need (RUFN).

High school GPA

The first independent variable used in the second model of the hierarchical logistic regression model was high school GPA (HSGPA). This GPA was collected during the admission process. Traditional high school GPA ranges from 0 to 4.0, although many students enter college with GPA's higher than 4.0 due to taking Honors, Advanced Placement (AP) class enrollment, or Dual-Enrollment (DE) classes during their high school career. At the institution used in the study, students must have a high school GPA of 2.6 in order to receive unconditional admission, although there are a limited number of students that earn conditional admissions each year. Students' high school GPAs were rounded to the nearest hundredth. HSGPA has consistently shown to be a strong predictor of student success in college (Blanchet, 2016; Chen & St. John, 2011; Cooper, 2018; Hodara & Lewis, 2017). High school GPA was used instead of standardized test scores for two primary reasons. The first was that the institution used in the study required either an ACT or an SAT, not both, so there would be a considerable loss of power in the study if only one of these standardized tests scores were used as the measure of incoming academic college preparation. The researcher could have decided to use a conversion chart to try to standardize these test scores but there is scant literature that shows the validity or reliability of these conversion/concordance charts. The second reason was because the SAT changed its scoring formula in March of 2016 and the sample of students used in this study were impacted by this change (Compare SAT Specifications, 2020). There were some students that took the "old" SAT, some that took both, and some that only took the "new" SAT. Once again, using this variable would

have led to a significant loss of power in the analysis or would have forced the researcher

to make uninformed decisions about converting old SAT scores to new SAT scores or

vice versa.

Remaining unmet financial need

The second independent variable used in model 3 of this study was the amount of

remaining unmet financial need (RUFN) an individual student had during their first year

of college enrollment. This variable was conceptualized as both a continuous measure

and as a dichotomous variable. For the continuous measure of unmet need, the amount

was calculated based on the calculated cost of attendance (COA) minus all student

financial aid and expected family contribution (EFC). The amount of student financial

aid is determined by a number of variables, including institutional scholarship/need based

grant amount, state grant eligibility, federal grant eligibility, and loan eligibility.

Eligibility for need-based aid and the calculation of EFC were determined based on

information the student provided on the Free Application for Federal Student Aid

(FAFSA). This application is required for every year of college enrollment and a

student's financial aid and EFC (and therefore remaining need) can change between

subsequent years of enrollment. In this study, remaining need was assumed to remain

consistent between years of enrollment. The range of remaining need had a lower bound

of $0 (a student had no financial need) and a higher bound of the COA for the incoming

year minus $5500, since all students in the sample were eligible for at least a $5500

unsubsidized loan.   After a comprehensive review of educational attainment and

persistence research conducted in the 2000's, Mayhew, et. al. (2006) write, "…greater

attention to unmet need, along with the extent to which several sources of financial aid

may reduce unmet need, may yield important insights (p. 392)." A large majority of the research that explores unmet need has found that after controlling for numerous other factors, unmet need consistently predicts lower levels of educational persistence and attainment (Chen & St. John, 2011: Herzog, 2005). For the dichotomous measure of unmet need, students were divided into two groups based on their RUFN. Those students with a remaining need over $5700 were coded as a 0 and students with a remaining need less than $5700 were coded as a 1.

The rationale for using the $5700 remaining need threshold was based on a combination of cost of attendance (COA) calculations and federal student loan policies. First, a common misunderstanding regarding student financial aid are the policies surrounding federal and private student loans (Adams, 2013; Friedman, 2017). Many students and their families, especially first-generation families, assume that they will be able to borrow federal student loans to cover their cost-of-attendance. While this is true for students with parents that are willing and able (based on their credit history) to borrow federal Parent Plus loans, students without the parental willingness or ability to borrow have much more limited options to cover their unmet financial need. FTIC students, regardless of parental support or dependency status, are able to borrow up to $5500 in federal loans during their first year. Assuming adequate yearly progress, students are able to borrow $6500 their second year, and $7500 during their third and fourth years. Independent students (including students 24 years old or older, married students, and students with dependent children) are able to borrow an additional $4000 during their first two years of enrollment and an additional $5000 during their last two years of enrollment. Dependent students who have a parent that applies for and is denied

a federal Parent Plus loan can borrow the same additional amounts in loans as an independent student. Students with an additional "parent denial" loan <u>did not</u> have this additional loan money ($4000) included in their calculation of unmet remaining financial need. This was done purposefully and is important for the justification of $5700 as the cut-point for the dichotomous measure of RUFN. The researcher believed that students with remaining unmet need higher than $5700 face an uncertain source of financing and are at a greater risk of dropping out than their peers with less remaining need.

The additional $1700 (on top of the $4000 potential additional "parent denial" loan) came from the cost of attendance calculation for all students. This calculation includes both indirect (books, travel, personal, room/meal estimates for off-campus students) and direct (tuition, fees, room/meal for on-campus students) costs for students. At the institution used in this study, approximately $1700 was added annually to the COA for personal and travel expenses and an additional $1000 was added for books/supplies. It is becoming an increasingly common viewpoint that these indirect costs are overlooked in financial aid research (Goldrick-Rab, 2016; The Hope Center, 2020) However, in this study, the researcher chose to include the $1700 as part of the calculation of which students faced a more uncertain source of financing. Since this $1700 is not a direct charge to the students, the researcher hypothesized that any students with a RUFN of less than $5700 were more likely to persist than students with a RUFN of more than $5700.

Remaining unmet financial need and its underlying values

The financial assistance office determined the remaining financial need of each student using the following set of variables: cost-of-attendance (COA), expected family

contribution (EFC) and student financial aid. The cost-of-attendance was for the fall and

spring academic year, which included direct costs (tuition and fees), along with

room/meal, books, transportation, and other estimated costs that were determined by the

financial assistance office. For students that were living on-campus, their room/meal was

a direct cost that was added to their student account. For students living off-campus or

with parents, their room/meal was estimated based on federal and institutional guidelines.

The expected family contribution is the financial support a student and their

family are expected to make towards their education. This calculation was based on

financial information that students/parents provided through the Free Application for

Federal Student Aid (FAFSA). The FAFSA first determines if a student is dependent or

independent. Dependent students were required to submit parental financial information,

along with student financial information. Independent students were not required to

submit parental financial information. EFC was then determined based on a combination

of family/student income (using IRS data) and assets. Students that were eligible to

submit a FAFSA but chose not to were assumed to have no remaining need. In an

interview with the director of financial assistance at the institution being examined, she

felt confident that there were no students that "slipped through the cracks" and did not fill

out the FAFSA even though they should have (Hensley, 2019).

Student financial aid was the amount of aid that is determined based on a variety

of factors. Students were first given a need-blind scholarship amount based on incoming

academic variables. High school GPA and standardized test scores (SAT/ACT) were

used as a matrix to assign students a score between 0 and 100. Students were grouped

into five "tiers" and scholarships were assigned based on their tier. Tier 1 students

received the highest academic scholarship, while tiers 2 and 3 received a smaller scholarship. Tier 4 students received an academic "grant" while Tier 5 students did not receive any type of academic scholarship/grant. FAFSA information was then used to determine if students were eligible for the Federal Pell Grant, Supplemental Educational Opportunity Grant (SEOG), and institutional need-based grants. All students in this dataset were eligible to receive federal direct student loans and the level of need determines if the loans were subsidized or unsubsidized. Student were eligible to borrow a total of $5500 in direct student loans during their first year, $6500 during their second year, and $7500 during their third and fourth years. Students with large amounts of need were also usually eligible to borrow additional federal loans in the form of a Perkins loan, with an average annual award of $1700. Students that were residents of the state where the institution is located were eligible for a state grant, regardless of need. Students whose parents were alumni of the institution received an additional one-time grant and students who have a parent that was an employee of the institution (or a number of affiliated secondary and post-secondary institutions) received an additional employee tuition discount. Finally, students that had an approved church provide some type of financial support received a matching grant from the institution. The institution matches the church support dollar for dollar up to $1000 and then at a rate of 25% after that. As an example, if a student receives a $2000 church grant, they would receive a matching grant of $1250 from the institution. "Outside" scholarships, such as those a student may get from their local high school, were not included in a student's financial aid package.

Control variables

   This study included demographic control variables, used in the first hierarchical

logistic regression model described in the introduction. As this was a study using data collected from one institution, there were no institutional characteristics (sector, size, location) used as controls. All of the demographic variables were consistent with what Integrated Postsecondary Education Data System (IPEDS) uses for reporting purposes.

Race/Ethnicity

In this study, due to having very small numbers of students in many of the race categories, students were dummy coded into a categorical variable where 0 = White and 1 = African American/Black, Hispanic/Latino, Asian, American Indian or Alaska Native, Native Hawaiian/other Pacific Islander, or Two or more races (AHANA). Students that selected Race and Ethnicity Unknown were coded as part of the White category. There were fifteen students in the dataset that were part of this group. See Table 1 for frequencies of each race category.

Table 1

Descriptive Statistics for Race/Ethnicity (n = 1284)

	Number	Percent
American Indian or Alaska Native	4	0.3
Asian	27	2.1
Black or African-American	166	12.9
Hispanics of any race	117	9.1
Native Hawaiian or Other Pacific Islander	1	0.1
Race and Ethnicity unknown	15	1.2
Two or more races	60	4.7
White	894	69.6

This collapsing of all categories other than white was done primarily to ensure adequate statistical power, as many of the race/ethnicity categories contained few

students. The author is aware how this type of categorical collapsing should only be done

through a critical orientation so that inequalities in groups of students are not

marginalized and individual stories silenced (Wells & Stage, 2015). Research that has

examined the affect of race/ethnicity on persistence and attainment primarily uses

between-college effects and has found mixed results (Chen, 2012; Titus, 2006a). Other

researchers have claimed that students from diverse backgrounds may access and respond

to financial aid in different ways (Chen & St. John, 2011). Students that were not eligible

for state and federal student aid (primarily international students) were excluded from the

study. In other words, the sample was restricted to only include students who could have

exercised some form of federal or state financial aid to pay for at least part of their

education.

Gender

In this study, gender was coded as a categorical variable where male = 0 and

female = 1. Some studies have found that women persist at higher rates than men

(Radford, Berkner, Wheeless, Shepherd, & Hunt-White, 2010) while other institutional

analyses have found an inconsistent relationship between proportion of women and

measures of persistence and attainment (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl,

2006; Porter, 1999).

Entry Year

Students were assigned a cohort year that corresponded with their first year of

enrollment in college after high school graduation. Some students had earned college

credit during high school in AP classes or dual-enrollment classes and may actually have

been considered a sophomore or junior by the registrar's office, but for the purposes of

this study, they were considered as first year students. Rising annual tuition has received

a lot of attention over the past decade and since 1980, tuition has more than tripled at

four-year institutions of higher education (Baum & Ma, 2014). Almost all of the research

that explores the effect of tuition on educational attainment have found no significant

relationship (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006; Titus, 2006a)

although some researchers suggest the importance of considering the ratio between state

need-based aid and tuition (Chen & St. John, 2011). Students that began in the fall of

2012 (lowest tuition) were coded as 1, while the cohort years 2013, 2014, 2015, 2016,

and 2017 were coded as 0. This coding was done to determine if there was a statistically

significant difference between the cohort year with the cheapest tuition (2012) and the

other cohort years, all of which had tuitions that were higher than 2012.

Dependent variables

There were two primary dependent variables used in this study. The first

dependent variable was a dichotomous outcome variable that was based on students'

persistence into their 3rd semester of enrollment (2nd fall). This measure is the traditional

measure of student "retention." The 5th semester of enrollment (3rd fall) was the second

dependent variable used in this research study. The researcher was interested in exploring

this expanded definition of student persistence to determine if there are significant

differences in odd ratios between the 3rd and 5th semesters of enrollment. The researcher

has reason to believe that some of the effects of unmet remaining need are masked during

the first year of college enrollment due to a variety of factors, including one-year

scholarships that many students receive from their high school and local community

(Ruritan Clubs, Rotary Clubs, Future Educator Scholarships, etc.). Additionally, students

are required to submit the FAFSA on an annual basis and a student's unmet need has the

potential to change after the first year. Coding for both of the dependent variables was 0

for did not persist/retain and 1 for persisted/retained. This outcome was based on full

time enrollment at the census date in the fall semester, which was the 10th day of the

semester.

Pre-Analysis Statistics

Before conducting the series of logistic regression analyses, the researcher ran a

number of descriptive statistics to screen for missing data, to test the assumptions of the

data, and to assess multicollinearity between continuous predictor variables. The only

variable with missing data was high school GPA. There were four students who were

missing a HSGPA value. Those four students were eliminated from the study. This left

1284 students as part of the final data analysis. Each of the variables had descriptive

statistics produced and outliers were identified. See table 2 for frequencies of each of the

categorical predictor variables, table 3 for the mean and standard deviation of the

continuous predictor variables, and table 4 for frequencies of the dependent variables.

Table 2

Descriptive Statistics of Control Variables and Dichotomous Independent Variable (n = 1284)

	Number	Percent
Cohort Year		
2012	208	16.2
2013-2017	1076	83.8
Gender		
Male	536	41.7
Female	748	58.3
Race		

Table 2 (continued)

White	909	70.8
AHANA	375	29.2
RUFN Group		
> $5700	593	46.2
< $5700	691	53.8

Table 3

Descriptive Statistics of Continuous Independent Variables (n = 1284)

	Min	Max	Mean	Standard Deviation
HSGPA	1.8	4.95	3.473	0.537
RUFN	0	19848	5260.12	4670.935

Table 4

Descriptive Statistics of Dependent Variables (n = 1284)

	Number	Percent
Retain to 2nd Fall		
Yes	966	75.2
No	318	24.8
Retain to 3rd Fall		
Yes	826	64.3
No	458	35.7

Next, descriptive statistics of the dependent variables crossed with each

categorical control variable were produced to identify sparse data (cells with low N or no

data). Sparseness can cause estimation problems (no convergence) and the maximum

likelihood estimation method used for our logistic regression analysis may not be able to

converge. If there is sparse data, the test of model deviance and Wald test will be biased

due to overly large parameter estimates and standard errors. See table 5 for results.

Sparseness was not identified as a potential issue for any of the data cells.

Table 5

Crosstabs of Control Variables and Dependent Variables (n = 1284)

	Yes FA2	No FA2	Yes FA3	No FA3
Cohort Year				
2012	161 (77%)	47 (23%)	143 (69%)	65 (31%)
2013-2017	805 (75%)	271 (25%)	683 (64%)	393 (37%)
Gender				
Male	382 (71%)	154 (29%)	330 (62%)	206 (38%)
Female	584 (78%)	164 (22%)	496 (66%)	252 (34%)
Race				
White	712 (78%)	197 (22%)	621 (68%)	288 (32%)
AHANA	254 (68%)	121 (32%)	205 (55%)	170 (45%)

*Percentages may not add to 100% due to rounding.

Descriptive statistics of the dependent variables crossed with each of the

continuous independent variables were also produced to identify if there were any

problems associated with sparseness along the independent variables. Specifically, the

researcher looked for complete separation of groups (persisted into 2nd fall, did not persist

into 2nd fall) along each of the independent variables. For example, if all students below

a 3.5 GPA failed to persist, this could lead to similar problems with sparseness as

described in the preceding paragraph. See Table 6 for results of the continuous

independent variables (grouped as an ordinal variable for presentation purposes) and

categorical independent variable. Sparseness was not identified as a potential issue for

any of the continuous independent variables or the categorical independent variable.

Table 6

Crosstabs of Independent Variables and Dependent Variables (n = 1284)

	Yes FA2	No FA2	Yes FA3	No FA3
HSGPA				
1.8 - 3.08	165 (51%)	156 (49%)	129 (40%)	192 (60%)
3.09 - 3.49	224 (70%)	97 (30%)	176 (55%)	145 (45%)
3.5 - 3.89	275 (85%)	50 (15%)	239 (74%)	86 (27%)
3.9 - 4.95	302 (95%)	15 (5%)	282 (89%)	35 (11%)
RUFN (Continuous, but grouped as an ordinal variable for presentation purposes)				
$0	329 (85%)	58 (15%)	298 (77%)	89 (23%)
$1 - $5108	218 (85%)	37 (15%)	183 (72%)	72 (28%)
$5109 - $8793	235 (75%)	77 (25%)	198 (63%)	114 (37%)
$8794 - $19,848	184 (56%)	146 (44%)	147 (45%)	183 (56%)
RUFN (Dichotomous)				
> $5700	382 (64%)	211 (36%)	312 (53%)	281 (47%)
< $5700	584 (85%)	107 (16%)	514 (74%)	177 (26%)

*Percentages may not add to 100% due to rounding.

Finally, the two continuous independent variables (HSGPA and RUFN) were assessed for multicollinearity by performing a correlation analysis. As expected, the two independent continuous variables were significantly correlated ($r = -.477$, $p < .01$) but not so closely that multicollinearity was considered an issue. See Table 7 for results.

Table 7

Correlation of HSGPA and RUFN (n = 1284)

	HSGPA	RUFN
HSGPA	1.000	
RUFN	-.477**	1.000

** $p < .01$

Analysis

This research investigated the role that remaining financial need played in student persistence at a small, 4-year, private, religiously affiliated, liberal arts institution in the southeast United States. The research design for this study used the conceptual model proposed by Berger and Milem (2000), which expanded upon the well-established importance of a student's academic and social experience to include the functional domain of a student's experience and its potential impact on college outcomes. The functional area that was explored in this study is the amount of remaining unmet financial need a student has and how it affected student persistence. A series of hierarchical logistic regression analyses were conducted to determine the extent that remaining unmet financial need influenced the persistence of students.

For the first model, a logistic regression analysis was used that measured the amount of deviance left unexplained with demographic control variables (race/ethnicity, gender, cohort year) as predictors of both 3rd and 5th semester persistence. This amount of unexplained deviance was tested for significance to determine if the model (control variables) adequately predicts the criterion (persisted into 3rd and 5th semesters).

For the second model, a logistic regression model that added HSGPA variable was compared to a the first model that uses only the demographic control variables to determine if HSGPA adds to the model in a statistically significant way. A Likelihood Ratio χ^2 Test for Significance was conducted to determine if the full model (model that includes HSGPA and demographic control variables) performed better than a model without it (only demographic control variables). This analysis and comparison was done separately for both 3rd semester persistence and 5th semester persistence. Research has

shown that students' precollege academic skills and abilities play a role in departure

decisions (Tinto, 1987; Tinto, 2012). Research has also shown that greater persistence

can be predicted at institutions considered more selective based on students' high school

grades and test scores (Alon & Tienda, 2005; Long, 2008)

The third model added remaining unmet financial need (RUFN) as a variable.

This model included two *separate and distinct* analyses and quantified remaining unmet

financial need as a continuous variable in the first analysis and a dichotomous variable in

the separate second analysis. The full model that added a continuous measure of

remaining unmet financial need was analyzed and compared with the reduced model that

only includes HSGPA and the demographic control variables. A Likelihood Ratio χ^2 Test

for Significance was then conducted to determine if the full model (model that includes

RUFN, HSGPA and demographic control variables) worked better than a model without

it (only HSGPA and control variables) for both 3rd semester and 5th semester measures of

persistence. For the second analysis, a dichotomous measure of unmet remaining

financial need was used. Two groups of students were created that included those with a

remaining unmet need of greater than $5700 and those with a remaining unmet need less

than $5700. A group comparison of average 3rd semester and 5th semester persistence

rates was analyzed to determine if there are significant group differences between the two

groups of students. Research has consistently determined that remaining need is a

significant predictor of higher rates of attrition, even after controlling for many other

student and institutional characteristics (Bresciani & Carson, 2002; Herzog, 2005; Titus,

2006).

Limitations

A limitation to any study involving student finance is the fact that financial assistance is based on an annual snapshot of a student's financial situation. For dependent students (virtually all students under 24 years old), this includes parents' income and assets. This study was using financial information from a student's first year in college to determine their remaining financial need. The study assumed that the student's financial situation did not change significantly from year to year during their time of enrollment. While this is true for most students during their undergraduate enrollment, there are a number of students that have major life changes while in college that will affect their remaining financial need, most notably the loss of employment for a parent. This study did not control for this variable. Future research could look at students with noteworthy changes in their remaining unmet financial need and how it impacted their persistence.

A second limitation to this study was based on differential cost of attendance amounts that students have or are able to request on an annual basis. Aside from the differentiated cost of the three main attendance categories for student (on-campus, off-campus, with-parent), students can request to have their cost of attendance increased for educational purposes, such as buying a new computer or having significant course fees, such as nursing programs or taking a large number of art/music classes. Increasing the cost of attendance impacts remaining unmet financial need and thus could have affected the results. Future research could attempt to define unmet remaining financial need by using a more consistent measure of cost, such as billed tuition.

A final limitation to this study was that it did not consider academic/social integration as one of the variables used in the study. While this variable would have been difficult to conceptualize and measure, it was also done purposefully due to the researchers concern that academic/social integration is at least partially mediated by a student's remaining financial need. Students with little or low remaining financial need may be more able/willing to live on campus, participate in social activities, and integrate with the academic and social expectations of a small, liberal arts campus. Students that have high remaining needs may feel more pressure to work off campus or live at home to help reduce costs, therefore limiting their ability to integrate at the level as their peers. Future studies could look at the relationship between remaining financial need and level of campus integration.

Conclusion

By exploring the intersection between students remaining unmet financial need and their persistence behaviors, the researcher hoped to shed light into the larger phenomenon of student success in higher education. While this study is not generalizable for all students enrolled across the various sectors of higher education, it should add to existing literature on the role that remaining unmet financial need (one category of the larger umbrella of financial assistance in general) plays in student persistence outcomes.

Chapter 4-Results

The purpose of this study was to explore the relationship between remaining unmet financial need of students and their educational persistence at a small, private, religiously affiliated liberal arts university in the southeastern United States. The researcher believed that remaining unmet financial need would have a negative relationship with persistence into the 3rd semester (2nd fall) and a negative relationship with persistence into the 5th semester (3rd fall). Logistic regression with variables added in a hierarchical order was used for all models.

Model Results for 3rd semester (2nd fall) measures of persistence

Models 1A and 1B

Models 1A and 1B included only the three variables that the researcher used as controls (gender, entrance year, and race) to analyze their relationship with 3rd semester (2nd fall) persistence. Models 1A and 1B included the exact same variables and therefore produced the same results.

Models 1A & 1B accounted for a significantly better outcome than the constant only (null) model. Based on a significant likelihood ratio χ^2 test ($\chi^2 = 22.23$, df = 3, p < .001), which tested the amount of null deviance explained by the set of predictors, Models 1A & 1B explained a significant amount of null deviance. The three measures of effect size (Cox & Snell R^2, Nagelkerke R^2, and R^2_L) all showed small effect sizes with between 1.5% - 2.5% of the deviance explained by the set of predictors. See Table 8 for results.

Table 8

Logistic Regression for Models 1A and 1B

$\chi2$	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
22.3	3	0.000	0.017	0.025	0.015

When looking at the contributions of each control variable, gender (OR = 1.390, p < .05, CI 1.074 to 1.797) and race/ethnicity (OR = 0.594, p < .01, CI .454 to .777) both had significant odds ratios associated with them while entry year did not. As females were coded "1" in the data set, the odds of persisting into the 3rd semester of enrollment are 1.390 times higher if a student is female vs. if they are male. Students that were AHANA had odds of persisting that were .594 times lower than students that were white. These results partially support hypothesis #1, which projected that all three demographic control variables would have an insignificant relationship with 2nd fall persistence. This was true for cohort year but not for race/ethnicity or gender. See Table 9, which includes all parameter estimates for the models with 3rd semester (2nd fall) as the dependent variable.

Table 9

Logistic Regression Analysis for Variables Predicting Persistence into 3rd semester (2nd Fall) for Students Enrolled at a Small, Private, Liberal Arts University in the Southeastern United States between 2012 and 2017. (Sample n = 1284)

| | Continuous RUFN | | | | | | Dichotomous RUFN | | | | | |
| | Model 1A | | Model 2A | | Model 3A | | Model 1B | | Model 2B | | Model 3B | |
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Entry Year	1.104	0.182	1.182	0.199	1.073	0.202	1.104	0.182	1.182	0.199	1.094	0.202
Gender	1.390*	0.131	0.957	0.146	1.002	0.148	1.390*	0.131	0.957	0.146	0.999	0.148
Race/Ethnicity	0.594**	0.137	1.201	0.157	1.290	0.174	0.594**	0.137	1.201	0.157	1.277	0.159
HSGPA			7.959**	0.163	6.418**	0.174			7.959**	0.163	6.824**	0.169
RUFN					0.947**	0.017					1.642**	0.155

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

A classification table that predicted group membership (persisted to 2nd fall, did not persist to 2nd fall) based on the three control variables did not increase the overall percentage of correct classification, nor change either groups' percentage of correct classification. See Table 10.

Table 10
Models 1A & 1B-Classification Table for Predicting Persistence into 3rd semester (2nd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	966	0	100%
Did Not Persist	318	0	0%
Overall Percentage			75.2%

Note: The cut value used was 0.500

Models 2A & 2B

Models 2A & 2B included the three control variables (gender, entrance year, and race) along with the first predictor variable, HSGPA, to analyze their relationship with 3rd semester (2nd fall) persistence. Models 2A and 2B included the exact same variables and therefore produced the same results.

Models 2A & 2B accounted for a significantly better outcome than Models 1A & 1B. Based on a significant likelihood ratio χ^2 test ($\chi^2 = 203.687$, df = 1, p < .001), which tested the amount of null deviance explained by the addition of HSGPA above and beyond the control variables used in Models 1A and 1B, Models 2A & 2B explained significantly more null deviance. The three measures of effect size all increased, demonstrating better model fit than the model that included only the control variables. The Cox & Snell R^2 increased from 0.017 to 0.161, the Nagelkerke R^2 increased from 0.025 to 0.24, and the R^2_L increased from 0.015 to 0.157 in models 2A and 2B. The three

effect sizes accounted for between 15.7 % - 24.0 % of the null deviance explained by the set of predictors. See Table 11 for results.

Table 11
Logistic Regression for Models 2A and 2B

χ2	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
203.687	1	0.000	0.161	0.240	0.157

When looking at the contributions of each variable included in models 2A and 2B, the only statistically significant odds ratio was associated with HSGPA (OR = 7.959, p < .001, CI 5.787 to 10.947). Gender, entry year, and race/ethnicity all had insignificant odds ratios. These results supported hypothesis #2, which predicted that HSGPA would have a significant relationship with 2nd fall persistence. It also reframes the results from models 1A/1B that indicated a significant relationship between race/ethnicity and gender and 2nd fall persistence. Both of these relationships are no longer significant after controlling for HSGPA, fully supporting hypothesis #1. For every increase in one unit of high school grade point average, the odds of persisting into the 3rd semester (2nd fall) of enrollment increased by a factor of 7.959. A student with a 4.0 HSGPA was 7.959 times more likely to persist into the 2nd fall than a student with a 3.0 HSGPA, controlling for gender, entry year, and race/ethnicity. See Table 9.

A classification table that predicted group membership (persisted to 2nd fall, did not persist to 2nd fall) based on models 2A & 2B increased the overall percentage of correct classification to 77.8%, and increase of 2.6% from models 1A and 1B. The percentage of students that were correctly predicted to persist decreased from 100% to 93.5% but the percentage of students correctly predicted to not persist increased from 0% to 30.2%. See Table 12.

Table 12
Models 2A & 2B-Classification Table for Predicting Persistence into 3rd semester (2nd fall)

Observed		Predicted		
		Persisted	Did Not Persist	% Correct
	Persisted	903	63	93.5%
	Did Not Persist	222	96	30.2%
Overall Percentage				77.8%

Note: The cut value used was 0.500

Model 3A

Model 3A included the three control variables (gender, entrance year, and race), the first predictor variable, HSGPA, and added the second predictor variable, Remaining Unmet Financial Need (RUFN) to analyze their relationship with 3rd semester (2nd fall) persistence. Model 3A used RUFN as a continuous measure.

Model 3A accounted for a significantly better outcome than models 2A and 2B. Based on a significant likelihood ratio χ^2 test ($\chi^2 = 10.613$, df = 1, p < .01), which tested the amount of null deviance explained by the addition of RUFN above and beyond the variables used in models 2A & 2B, model 3A explained significantly more null deviance. The three measures of effect size all slightly increased, demonstrating better model fit than the model that included only the control variables and HSGPA. The Cox & Snell R^2 increased from 0.161 to 0.168, the Nagelkerke R^2 increased from 0.24 to 0.25, and the R^2_L increased from 0.157 to 0.165 in model 3A. The three effect sizes accounted for between 16.5 % - 25.0 % of the null deviance explained by the set of predictors. See Table 13 for results.

Table 13
Logistic Regression for Model 3A

χ^2	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
10.613	1	0.001	0.168	0.250	0.165

When looking at the contributions of each variable included in model 3A, the statistically significant odds ratio were associated with HSGPA (OR = 6.418, p < .001, CI 4.560 to 9.034) and RUFN (OR = .947, p < .01, CI 0.916 to 0.979). Gender, entry year, and race/ethnicity all had insignificant odds ratios. These results supported hypothesis #3, that RUFN (as a continuous variable) would have a statistically significant relationship with 2nd fall persistence. It also strengthened hypothesis #2, that HSGPA would have a statistically significant relationship with 2nd fall persistence. For every increase in one unit of high school grade point average, the odds of persisting into the 3rd semester (2nd fall) of enrollment increased by a factor of 6.418. A student with a 4.0 HSGPA was 6.418 times more likely to persist into the 2nd fall than a student with a 3.0 HSGPA, controlling for gender, entry year, race/ethnicity, and RUFN. For every increase in one unit of remaining unmet financial need (a unit is = $1000), the odds of persisting into the 3rd semester (2nd fall) of enrollment decreased by a factor of 0.947. A student with a RUFN of $1000 was 0.947 times as likely to persist into the 2nd fall than a student with a $0 RUFN, controlling for HSGPA, gender, entry year, and race/ethnicity. A student with a RUFN of $7000 was 0.68 times as likely to persist into their 2nd fall as a student with a RUFN of $0, controlling for HSGPA, gender, entry year, and race/ethnicity. See Table 9.

A classification table that predicted group membership (persisted to 2nd fall, did not persist to 2nd fall) based on model 3A did not increase the overall percentage of correct classification. The overall percentage of correct classification decreased from 77.8% in models 2A & 2B to 77.3% in model 3A. The percentage of students that were

correctly predicted to persist decreased from 93.5% to 92.5% while the percentage of

students correctly predicted to not persist increased from 30.2% to 30.8%. See Table 14.

Table 14

Model 3A-Classification Table for Predicting Persistence into 3rd semester (2nd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	894	72	92.5%
Did Not Persist	220	98	30.8%
Overall Percentage			77.3%

Note: The cut value used was 0.500

Models 3B

Model 3B included the three control variables (gender, entrance year, and race),

the first predictor variable, HSGPA, and added the second predictor variable, Remaining

Unmet Financial Need (RUFN) to analyze their relationship with 3rd semester (2nd fall)

persistence. Model 3B used RUFN as a dichotomous grouping measure, with $5700 as

the cut point. To avoid confusion, the dichotomous measure of RUFN will be referred to

as RUFN(d).

Model 3B accounted for a significantly better outcome than models 2A and 2B.

Based on a significant likelihood ratio χ^2 test ($\chi^2 = 10.3$, df = 1, p < .01), which tested the

amount of null deviance explained by the addition of RUFN(d) above and beyond the

variables used in models 2A & 2B, model 3B explained significantly more null deviance.

The three measures of effect size all increased, demonstrating better model fit than the

model that included only the control variables and HSGPA. The Cox & Snell R^2

increased from 0.161 to 0.168, the Nagelkerke R^2 increased from 0.24 to 0.249, and the

R^2_L increased from 0.157 to 0.164 in model 3A. The three effect sizes accounted for

between 16.4 % - 24.9 % of the null deviance explained by the set of predictors. See

Table 15 for results.

Table 15
Logistic Regression for Model 3B

χ^2	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
10.3	1	0.001	0.168	0.249	0.164

When looking at the contributions of each variable included in model 3B, the

statistically significant odds ratio were associated with HSGPA (OR = 6.824, p < .001, CI

4.903 to 9.498) and RUFN(d) (OR = 1.642, p < .01, CI 1.212 to 2.223). Gender, entry

year, and race/ethnicity all had insignificant odds ratios. These results supported

hypothesis #4, that RUFN (as a dichotomous variable) would have a statistically

significant relationship with 2nd fall persistence. It also strengthened hypothesis #2, that

HSGPA would have a statistically significant relationship with 2nd fall persistence. For

every increase in one unit of high school grade point average, the odds of persisting into

the 3rd semester (2nd fall) of enrollment increased by a factor of 6.824. A student with a

4.0 HSGPA was 6.824 times more likely to persist into the 2nd fall than a student with a

3.0 HSGPA, controlling for gender, entry year, race/ethnicity, and RUFN(d). For every

increase in one unit of RUFN(d) the odds of persisting into the 3rd semester (2nd fall) of

enrollment increased by a factor of 1.642. A student in group 1 (a RUFN less than $5700)

was 1.642 times as likely to persist into the 2nd fall than a student in group 0 (a RUFN of

more than $5700), controlling for HSGPA, gender, entry year, and race/ethnicity. See

Table 9.

A classification table that predicted group membership (persisted to 2nd fall, did

not persist to 2nd fall) based on model 3B increased the overall percentage of correct

classification, from 77.8% in models 2A & 2B to 78.0% in model 3B. The percentage of

students that were correctly predicted to persist decreased from 93.5% to 93.3%, and the

percentage of students correctly predicted to not persist increased from 30.2% to 31.8%.

See Table 16.

Table 16
Model 3B-Classification Table for Predicting Persistence into 3rd semester (2nd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	901	65	93.3%
Did Not Persist	217	101	31.8%
Overall Percentage			78.0%

Note: The cut value used was 0.500

Model Results for 5th semester (3rd fall) measures of persistence

Models 1C & 1D

Models 1C and 1D included only the three variables that the researcher used as

controls (gender, entrance year, and race) to analyze their relationship with 5th semester

(3rd fall) persistence. Models 1C and 1D included the exact same variables and therefore

produced the same results.

Models 1C & 1D accounted for a significantly better outcome than the constant

only (null) model. Based on a significant likelihood ratio χ^2 test ($\chi^2 = 24.939$, df = 3, p <

.001), which tested the amount of null deviance explained by the set of predictors,

Models 1C & 1D explained a significant amount of null deviance. The three measures of

effect size (Cox & Snell R^2, Nagelkerke R^2, and R^2_L) all showed small effect sizes with

between 1.9% - 2.6% of the deviance explained by the set of predictors. See Table 17 for

results.

Table 17

Logistic Regression for Models 1C and 1D

χ^2	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
24.939	3	0.000	0.019	0.026	0.015

When looking at the contributions of each control variable, race/ethnicity (OR = 0.567, p < .01, CI .443 to .726)) contributed the only significant odds ratio, while gender (OR = 1.180, p > .05) and entry year (OR = 1.229, p > .05) did not contribute significantly. These results partially support hypothesis #1, which projected that all three demographic control variables would have an insignificant relationship with 3rd fall persistence. This was true for cohort year and gender but not for race/ethnicity. Students that were AHANA had odds of persisting that were .567 times lower than students that were white. See Table 18, which includes all parameter estimates for the models with 5th semester (3rd fall) as the dependent variable.

Table 18

Logistic Regression Analysis for Variables Predicting Persistence into 5th semester (3nd Fall) for Students Enrolled at a Small, Private, Liberal Arts University in the Southeastern United States between 2012 and 2017. (Sample n = 1284)

| | Continuous RUFN | | | | | | Dichotomous RUFN | | | | | |
| | Model 1C | | Model 2C | | Model 3C | | Model 1D | | Model 2D | | Model 3D | |
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Entry Year	1.229	0.164	1.321	0.178	1.229	0.180	1.229	0.164	1.321	0.178	1.244	0.180
Gender	1.180	0.119	0.839	0.132	1.180	0.133	1.180	0.119	0.839	0.132	0.866	0.133
Race/Ethnicity	0.567**	0.126	1.066	0.144	1.130	0.146	0.567**	0.126	1.066	0.144	1.115	0.145
HSGPA			6.218**	0.144	5.261**	0.155			6.218**	0.144	5.507**	0.150
RUFN					0.956**	0.015					1.460**	0.137

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

A classification table that predicted group membership (persisted to 3rd fall, did not persist to 3rd fall) based on the three control variables did not increase the overall percentage of correct classification, nor change either groups percentage of correct classification. See Table 19.

Table 19

Models 1C & 1D-Classification Table for Predicting Persistence into 5th semester (2nd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	826	0	100%
Did Not Persist	458	0	0%
Overall Percentage			64.3%

Note: The cut value used was 0.500

Models 2C & 2D

Models 2C & 2D included the three control variables (gender, entrance year, and race) along with the first predictor variable, HSGPA, to analyze their relationship with 5th semester (3rd fall) persistence. Models 2C and 2D included the exact same variables and therefore produced the same results.

Models 2C and 2D accounted for a significantly better outcome than Models 1C & 1D. Based on a significant likelihood ratio χ^2 test ($\chi^2 = 195.756$, df = 1, p < .001), which tested the amount of null deviance explained by the addition of HSGPA above and beyond the control variables used in Models 1C & 1D, Models 2C & 2D explained significantly more null deviance. The three measures of effect size all increased, demonstrating better model fit than the model that included only the control variables. The Cox & Snell R^2 increased from 0.019 to 0.158, the Nagelkerke R^2 increased from 0.026 to 0.217, and the R^2_L increased from 0.015 to 0.132 in models 2A and 2B. The

three effect sizes accounted for between 13.2 % - 21.7 % of the null deviance explained

by the set of predictors. See Table 20 for results.

Table 20
Logistic Regression for Models 2C and 2D

$\chi2$	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
203.687	1	0.000	0.158	0.217	0.132

When looking at the contributions of each variable included in models 2C and 2D,

the only statistically significant odds ratio was associated with HSGPA (OR = 6.218, p <

.001, CI 4.686 to 8.251). Gender, entry year, and race/ethnicity all had non-significant

odds ratios. These results supported hypothesis #2, that HSGPA would have a significant

relationship with 3rd fall persistence. It also reframes the results from models 1C/1D that

indicated a significant relationship between race/ethnicity and 3rd fall persistence. This

significant relationship was no longer present when controlling for HSGPA, which

supports hypothesis #1. For every increase in one unit of high school grade point

average, the odds of persisting into the 5th semester (3rd fall) of enrollment increased by a

factor of 6.218. A student with a 4.0 HSGPA was 6.218 times more likely to persist into

the 3rd fall than a student with a 3.0 HSGPA, controlling for gender, entry year, and

race/ethnicity. See Table 18.

Foreshadowed by an increase is effect sizes, a classification table that predicted

group membership (persisted to 3rd fall, did not persist to 3rd fall) based on models 2A &

2B increased the overall percentage of correct classification to 69.9%, an increase of

5.6% from models 1C and 1D. The percentage of students that were correctly predicted to

persist decreased from 100% to 85.4% but the percentage of students correctly predicted

to not persist increased from 0% to 42.1%. See Table 21.

Table 21

Models 2C and 2D-Classification Table for Predicting Persistence into 5th semester (3rd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	705	121	85.4%
Did Not Persist	265	193	42.1%
Overall Percentage			69.9%

Note: The cut value used was 0.500

Model 3C

Model 3C included the three control variables (gender, entrance year, and race), the first predictor variable, HSGPA, and added the second predictor variable, Remaining Unmet Financial Need (RUFN) to analyze their relationship with 5th semester (3rd fall) persistence. Model 3C used RUFN as a continuous measure.

Model 3C accounted for a significantly better outcome than models 2C and 2D. Based on a significant likelihood ratio χ^2 test ($\chi^2 = 8.459$, df = 1, p < .01), which tested the amount of null deviance explained by the addition of RUFN above and beyond the variables used in models 2C & 2D, model 3C explained significantly more null deviance. The three measures of effect size all slightly increased, demonstrating better model fit than the model that included only the control variables and HSGPA. The Cox & Snell R^2 increased from 0.158 to 0.163, the Nagelkerke R^2 increased from 0.217 to 0.224, and the R^2_L increased from 0.132 to 0.137 in model 3C. The three effect sizes accounted for between 13.7% - 22.4% of the null deviance explained by the set of predictors. See Table 22 for results.

Table 22

Logistic Regression for Model 3C

$\chi2$	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
8.459	1	0.004	0.163	0.224	0.137

When looking at the contributions of each variable included in model 3C, the statistically significant odds ratio were associated with HSGPA (OR = 5.261, p < .001, CI 3.886 to 7.122) and RUFN (OR = .956, p < .01, CI 0.928 to 0.986). Gender, entry year, and race/ethnicity all had insignificant odds ratios. These results supported hypothesis #3, that RUFN (as a continuous variable) would have a statistically significant relationship with 3rd fall persistence. It also strengthened hypothesis #2, that HSGPA would have a statistically significant relationship with 3rd fall persistence. For every increase in one unit of high school grade point average, the odds of persisting into the 5th semester (3rd fall) of enrollment increased by a factor of 5.261. A student with a 4.0 HSGPA was 5.261 times more likely to persist into the 3rd fall than a student with a 3.0 HSGPA, controlling for gender, entry year, race/ethnicity, and RUFN(d). For every increase in one unit of remaining unmet financial need (a unit is = $1000), the odds of persisting into the 5th semester (3rd fall) of enrollment decreased by a factor of 0.956. A student with a RUFN of $1000 was 0.956 times as likely to persist into the 3rd fall than a student with a $0 RUFN, controlling for HSGPA, gender, entry year, and race/ethnicity. A student with a RUFN of $7000 was times 0.730 times as likely to persist into their 3rd fall as a student with a RUFN of $0, controlling for HSGPA, gender, entry year, and race/ethnicity. See Table 18.

A classification table that predicted group membership (persisted to 3rd fall, did not persist to 3rd fall) based on model 3C increased the overall percentage of correct classification. The overall percentage of correct classification increased from 69.9% in models 2C & 2D to 70.7% in model 3C. The percentage of students that were correctly

predicted to persist increased from 85.4% to 86.6% while the percentage of students

correctly predicted to not persist remained the same at 42.1%. See Table 23.

Table 23

Model 3C-Classification Table for Predicting Persistence into 5th semester (3rd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	715	111	86.6%
Did Not Persist	265	193	42.1%
Overall Percentage			70.7%

Note: The cut value used was 0.500

Model 3D

Model 3D included the three control variables (gender, entrance year, and race),

the first predictor variable, HSGPA, and added the second predictor variable, Remaining

Unmet Financial Need (RUFN) to analyze their relationship with 5th semester (3rd fall)

persistence. Model 3B used RUFN as a dichotomous grouping measure, with $5700 as

the cut point. To avoid confusion, the dichotomous measure of RUFN will be referred to

as RUFN(d).

Model 3D accounted for a significantly better outcome than models 2C and 2D.

Based on a significant likelihood ratio χ^2 test ($\chi^2 = 7.629$, df = 1, p < .01), which tested

the amount of null deviance explained by the addition of RUFN(d) above and beyond the

variables used in models 2C & 2D, model 3D explained significantly more null deviance.

The three measures of effect size all slightly increased, demonstrating better model fit

than the model that included only the control variables and HSGPA. The Cox & Snell R^2

increased from 0.158 to 0.163, the Nagelkerke R^2 increased from 0.217 to 0.224, and the

R^2_L increased from 0.132 to 0.136 in model 3D. The three effect sizes accounted for

between 13.6% - 22.4% of the null deviance explained by the set of predictors. See Table

24 for results.

Table 24
Logistic Regression for Model 3D

χ2	df	Sig.	Cox & Snell R^2	Nagelkerke R^2	R^2_L
7.629	1	0.004	0.163	0.224	0.136

When looking at the contributions of each variable included in model 3D, the

statistically significant odds ratio were associated with HSGPA (OR = 5.507, p < .001, CI

4.103 to 7.391) and RUFN (OR = 1.460, p < .01, CI 1.117 to 1.908). Gender, entry year,

and race/ethnicity all had insignificant odds ratios. These results supported hypothesis #4,

that RUFN (as a dichotomous variable) would have a statistically significant relationship

with 3rd fall persistence. It also strengthened hypothesis #2, that HSGPA would have a

statistically significant relationship with 3rd fall persistence. For every increase in one

unit of high school grade point average, the odds of persisting into the 5th semester (3rd

fall) of enrollment increased by a factor of 5.507. A student with a 4.0 HSGPA was 5.507

times more likely to persist into the 3rd fall than a student with a 3.0 HSGPA, controlling

for gender, entry year, race/ethnicity, and RUFN(d). For every decrease in one unit of

remaining unmet financial need, the odds of persisting into the 5th semester (3rd fall) of

enrollment increased by a factor of 1.460. A student in group 1 (a RUFN less than

$5700) was 1.460 times as likely to persist into the 3rd fall than a student in group 0 (a

RUFN of more than $5700), controlling for HSGPA, gender, entry year, and

race/ethnicity. See Table 18.

A classification table that predicted group membership (persisted to 3rd fall, did

not persist to 3rd fall) based on model 3D increased the overall percentage of correct

classification, from 69.9% in models 2C & 2D to 70.0% in model 3D. The percentage of

students that were correctly predicted to persist decreased from 85.4% to 85.1% and the

percentage of students correctly predicted to not persist increased from 42.1% to 42.8%.

See Table 25.

Table 25

Model 3D-Classification Table for Predicting Persistence into 5th semester (3rd fall)

Observed	Predicted		
	Persisted	Did Not Persist	% Correct
Persisted	703	123	85.1%
Did Not Persist	262	196	42.8%
Overall Percentage			70.0%

Note: The cut value used was 0.500

Chapter 5-Discussion

This study aimed to quantify the relationship between the remaining unmet financial need of students enrolled in a small, private, religiously affiliated, liberal arts university in the southeastern United States and their educational persistence. The researcher combined financial assistance and institutional persistence data for six cohorts of first year students and used a hierarchical logistic regression analysis to explore this relationship. The study used four different models to predict the persistence of students into both their 2nd fall and 3rd fall of enrollment. The four models used are summarized below:

1. To what extent do models that include only demographic control variables predict persistence into the 3rd and 5th semesters of enrollment?

2. To what extent does high school grade point average (HSGPA) add to the models that include demographic control variables when predicting the outcomes (persistence into 3rd and 5th semester)?

3. To what extent does remaining unmet financial need (as a continuous variable) add to the models that include HSGPA and demographic control variables when predicting the outcomes (persistence into 3rd and 5th semester)?

4. To what extent does remaining unmet financial need (as a dichotomous grouping variable) add to the models that include HSGPA and demographic control variables when predicting the outcomes (persistence into 3rd and 5th semester)?

Review of Findings

Models 1A-1D

Models 1A though 1D included three control variables, entry year, gender, and race/ethnicity. Model 1A & 1B used a logistic regression to determine if these variables were significant predictors of 3rd semester (2nd fall) persistence while model 1C & 1D used a logistic regression to determine if these variables were significant predictors and 5th semester (3rd fall) persistence.

Entry Year. Entry year (as defined in the methodology section) was not a statistically significant predictor in any of the models. This finding aligns with almost all of the literature exploring the relationship between tuition and educational persistence that has found no significant relationship between the two (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006; Titus, 2006a). At the institution featured in this study, tuition increased for every cohort used in the study, which could lead many to wonder if rising costs are prohibiting college access and success. While this study does not attempt to explore the relationship between rising tuition costs and college access, it does not appear that students are less likely to persist as tuition costs have grown. One of the main contributing factors to this non-significant relationship could be the rising tuition discount at the institution over the same timeframe. The average discount rate has also steadily increased over time, which translates into first year students actually paying "out of pocket" relatively the same amount for their education as students the year before them (Hensley, 2019).   The average increase in discount rate has been a cause of concern for administrators and higher education researchers over the past decade and deserves continued attention in future research studies (Wu, 2017).

Gender. In model 1A/1B, gender was a statistically significant contributor to the model predicting 3rd semester persistence. Females had odds ratios that indicated they were more likely to persist into the 3rd semester than males. Based on the odds ratio (OR = 1.390, p < .05, CI 1.074 to 1.797), female students' odds of persisting into the 3rd semester were 1.390 higher than males, controlling for entry year and race/ethnicity. Taken without any other context, this finding could lend support to some studies that have found that women persist at higher rates than men (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006).

In models 1C/1D, gender is no longer a statistically significant contributor for the model that predicts 5th semester (3rd fall) persistence. Any significant effect that gender plays in persistence disappeared by the junior year at the institution used in the study. This was foreshadowed in Table 5 when looking at the gender statistics for persistence. Third semester persistence had a difference of seven percentage points between genders (female=78%, males=71%) while 5th semester persistence declined to only a four percentage point difference (female=66%, male=62%). This finding indicates that females and males persist at similar rates into their 5th semester (3rd fall), which supports research that has found an inconsistent relationship between gender and measures of persistence (Porter, 1999). Depending on which measure of persistence is being used, gender may or may not be a significant contributor to the model.

In models 2A-2D and 3A-3D, gender is not a statistically significant contributor. When adding HSGPA and Remaining Unmet Financial Need (RUFN) into the models, males and females persist into both 3rd semester and 5th semester at similar rates. The relationship between gender and HSGPA and RUFN was probed after running the

hierarchical logistic regression analysis to determine if there were any statistically significant differences between genders along these two independent variable measures. Running two independent sample t-tests, there were insignificant differences between genders when comparing average RUFN (t = 0.563, df = 1282, p = 0.573) but significant differences between genders when comparing average HSGPA (t = 6.925, df=1282, p < .001, CI of difference in mean 0.148 to 0.265). Females entered the institution used in this study with higher high school GPAs. While this study is not generalizable across all institutions of higher education, this reality may be present at many institutions, which may contribute to some of the literature that indicates females persist at higher rates than males. Future literature exploring the role that gender plays in measures of persistence should control for incoming academic variables.

Race/Ethnicity. For models 1A-1D, race/ethnicity (as defined in the methodology section) was a statistically significant predictor variable. Students that were AHANA had statistically significant lower odds ratios of persisting into both the 3rd semester of enrollment (OR = 0.594, p < .01, CI .454 to .777) and the 5th semester of enrollment (OR = 0.567, p < .01, CI .443 to .726). This was foreshadowed in Table 5, due to the large differences between white and AHANA students and their persistence rates. White students persisted at 78% and 68% respectively into their 3rd and 5th semesters while AHANA students persisted at lower rates, 68% and 55% respectively.

For models 2A-2D and 3A-3D, race/ethnicity was no longer a significant contributor to the model. After controlling for HSGPA and RUFN, white and AHANA students are equally as likely to persist into both the 3rd and 5th semesters. The inconsistent results for Models 1, 2, and 3 supports the literature that has found mixed

results when the effect of race/ethnicity on educational persistence and attainment is explored (Chen, 2012; Titus, 2006a).

The relationship between race/ethnicity and HSGPA and RUFN was probed after running the hierarchical logistic regression analysis to determine if there were any statistically significant differences between race/ethnicity groups along these two independent variable measures. Running two independent sample t-tests, there were significant differences between race/ethnicities when comparing average HSGPA (t = 13.072, df = 1282, p < .001, CI of difference in mean 0.344 to 0.466) and RUFN (t = 10.390, df=1282, p < .001, CI of difference in mean 2320.343 to 3402.779). White students entered the institution used in this study with higher high school GPAs and less remaining unmet financial need than AHANA students. While this study is not generalizable across all institutions of higher education, future studies exploring race/ethnicity and its impact on measures of persistence should be sure to control for both incoming academic variables and remaining unmet financial need.

As mentioned in the methodology section, Race/Ethnicity other than white was collapsed into a common grouping to ensure adequate statistical power. Future research that has adequate sample size should look at various subgroups of race/ethnicity to determine if there are significant group differences in their persistence rates, after controlling for a number of different measures, such as incoming HSGPA and RUFN.

Models 2A-2D

Models 2A-2B added high school GPA as a predictor variable for 3rd semester persistence. These models accounted for between 15.7% and 24.0% of the null deviance explained by the set of predictors, which was a substantial increase over models 1A &

1B, which only accounted for around 2% of the null deviance explained.   In models 2A-2B, HSGPA was the only variable that had a significant odds ratio (OR = 7.959, p < .001, CI 5.787 to 10.947). Gender and race/ethnicity were no longer significant. The relationship between HSGPA and both gender and race/ethnicity was analyzed and both sets of relationships had significant group differences, as discussed in previous paragraphs.

Models 2C-2D added high school GPA as a predictor variable for 5th semester persistence. Once again, there was a statistically significant difference between models 1C-1D and 2C-2D. The amount of null deviance explained increased from around 2% to between 13.2% and 21.7%. The only significant odds ratio belonged to HSGPA (OR = 6.218, p < .001, CI 4.686 to 8.251) and the three control variables did not have significant odds ratios associated with them.

These findings support the literature that has consistently shown HSGPA to be a strong predictor of student success in college (Blanchet, 2016; Chen & St. John, 2011; Cooper, 2018; Hodara & Lewis, 2017). This confirmation of previous research was not surprising and to use a colloquial phrase, it supported the idea that "the best predictor of future success is past success." While persistence is just one measure of student success in college, the results of this analysis helps confirm that students entering college with stronger academic backgrounds are more likely to persist into both their 3rd and 5th semesters of enrollment.

Models 3A-3D

Models 3A-3B added remaining unmet financial need as the final predictor variable for 3rd semester persistence while models 3C-3D added remaining unmet

financial need as a predictor variable for 5th semester persistence. Models A & C used RUFN as a continuous variable for 3rd and 5th semester persistence respectively and models B & D used RUFN as a dichotomous grouping variable for 3rd and 5th semester persistence respectively. All of the models that included RUFN (as both a continuous measure and a dichotomous grouping variable) had a statistically significant increase in the amount of null deviance explained over previous models that did not include RUFN. These findings support previous research that has shown a negative relationship between remaining unmet financial need and measures of persistence (Bresciani & Carson, 2002; Mayhew, et al., 2016; Ternes, 2017)

Implications for Higher Education Leaders

The following is a list of five recommendations for higher education leaders, incorporating any relevant links to the theoretical, conceptual, or leadership frameworks presented in Chapter 2. In summary, these are: collecting RUFN data; identifying trends; faculty considerations; personnel implications; and macro-level considerations.

Collecting RUFN Data

The first recommendation is quite simple and straightforward. Data concerning students remaining unmet financial need needs to be systematically collected, combined with persistence data, analyzed, and shared widely among university leaders. Based on this research, RUFN impacts student outcomes and access to this information should not be isolated to only the financial assistance office. While student data privacy should always be of utmost importance, any attempts by the financial assistance office to "protect this data" from other leaders at the university may have negative consequences for students with large amounts of remaining need.

The implications of this recommendation are directly related to the theory of shared leadership. At small, private institutions with increasing levels of tuition discounting, the financial assistance office is not simply a processing office, where forms are collected and policies are followed. The director of this office is an important leader on campus, one of the crucial "middle leaders" that can influence and educate both administrators above and office staff below on the realities of how RUFN impacts student persistence. Key staff members that should be informed by data coming from the financial assistance office include enrollment, business office, academic, and student life personnel. Additionally, all employees of the financial assistance office that have direct contact with students and their families should have an understanding of how RUFN impacts student outcomes.

The theoretical framework of organized anarchy and its main tenants (fluid participation, problematic goals) are important considerations in regards to this first recommendation. Enrollment leaders at these institutions are often under extreme amounts of pressure to bring in the budgeted amount of new students. Failure to do so can quickly create turnover in administrators and staff most involved in student recruitment. It can also create a situation where students are targeted and recruited but not offered the realistic financial support to persist. These existential decisions concerning student recruitment, enrollment, and financial assistance need more "organization" and less "anarchy," both for the sake of students and institutions.

Identifying Trends

The second recommendation is that trends in the RUFN of students are identified and once again shared with university leaders. How many students with a RUFN of

greater than $5700 enrolled in 2010? Has that number consistently gotten larger over the past decade? Retention and graduation rates are often broken down by various demographics. Do residential students retain better than commuting students? Do students in the honors program retain better other students? Is the graduation rate of white students higher than Hispanic students? These measures of student outcomes should also include a snapshot of students based on their RUFN. How does the retention rate of students with a $0 RUFN compare to students that are in the $1 to $2000 RUFN? What about students in the $9000 or more RUFN category? An argument could also be made that schools should be required to report this information annually so that students and their families would have a more transparent understanding of an institution's commitment to meeting the needs of students. Beginning to answer these questions could benefit both students and the institutions they attend due to an increased understanding of the negative relationship between large amounts of RUFN and student persistence. Institutions may be able to more accurately assess how increasing institutional need-based aid (to lower RUFN) impacts long-term tuition revenue.

It is critical to consider that students RUFN is something that institutions can and should control. As Berger and Milem's conceptual model so appropriately identifies, the real and perceived functional aspects of a student's experience have significant effects on student persistence outcomes. Just as institutions shape and influence the academic and social domains of their campus, this functional domain is similarly shaped by decisions that leaders make. Upward trends in the average amount of RUFN or the number of students with RUFN of $5700 or more need to be identified, discussed, and justified. At the institution used in the study, the percentage of first year students with a RUFN greater

than $5700 was 33.2% in 2012. By 2017, this number had jumped to 56.5% of the first

year cohort. This has clear, problematic implications for student persistence outcomes.

Faculty Considerations

A third recommendation is that faculty carefully look at students within their

departments, their average levels of RUFN and how academic policies/procedures

specific to their department may affect these students. Minimum GPA policies, DFW

rates, and required repeats for courses where students have already earned a passing

grade are likely to have a disproportionate impact on students with higher levels of

RUFN. Taking a summer "repeat" course or enrolling for an extra semester may not be a

huge burden on students with small amounts of RUFN, but for students with large RUFN,

it could push them towards a departure decision from the university. Faculty within these

departments need to clearly articulate why these policies are in place, especially for

majors that do not have any type of outside accrediting body associated with them (such

as nursing, accounting, education, etc.).

Once again, student persistence is not simply a problem for leaders of the

President's cabinet or any other TMT to consider. Shared leadership, especially at

institutions of higher education where faculty are a crucial part of the leadership model,

demands that individual departments grapple with how student's financial situations

influence persistence within all major programs. Reviewing departmental and academic

policies on a regular basis, through a critical lens of how it may affect students with high

amounts of financial need, is an important part of any institutions efforts to maintain or

increase student persistence outcomes. Examples of these policies are add/drop

timeframes, course repetition requirements, transfer credits accepted, and minimum GPA

requirements to enter various majors.

Personnel Implications

A fourth recommendation is that institutional leaders need to continue to be

mindful with how organized anarchy impacts decision making at institutions of higher

education. Every decision to add additional employees, be it faculty, staff, or

administrators, requires additional revenue. At schools where a large majority of the

revenue comes from student tuition/fees (private institutions with small endowments),

this means either increasing the number of students enrolled or increasing the amount

charged for each student. As cited numerous times throughout this study (Grawe, 2018;

McGee, 2015), adding more students may be difficult over the next few decades due to

population demographic realities and increased competition. Private schools that are not

considered elite and with small to modest endowments that *are* successful in increasing

their traditional undergraduate enrollments are likely to do so by enrolling students that

have less ability to pay (The 2015 Student Success State of the Union, 2015). Hiring an

administrative assistant in the Chemistry department or an additional resident director for

a dorm, while most likely justifiable in many regards, also means asking students to pay

more, which likely increases the amount of RUFN many students would have. In

isolation, these additional hires may not have a huge impact on the budget. However, if

decision making in regards to budgetary considerations is not centralized (i.e., garbage

can decision making), it will, without a doubt, negatively affect students with respect to

the functional domain of the student experience (Manning, 2018).

This recommendation also directly implicates the idea of efficiency vs. effectiveness that Weinzimmer and McConoughey discuss in their book entitled "The Wisdom of Failure" (2013). Institutions and individual departments can focus internally and become very efficient by hiring additional personnel to perform various tasks. However, when viewed from the perspective of the outside environment and how it impacts students and their financial realities, hiring additional personnel may not be the effective choice. Effective choices are strategic in nature, consider multiple perspectives, and understand the needs of the "customer," in this case, the students. While efficiency (doing things right) is important for any leader to consider, it should not come at the expense of effectiveness (doing the right thing) (Weinzimmer & McConoughey, 2013).

Macro Level Considerations

A fifth recommendation is that politicians and governmental leaders continue to pay attention to how finances affect student success in higher education. In an upcoming presidential election season, there will be continued calls for "free college" and "loan forgiveness" policies. While this research did not explore policies related to federal and state funding of higher education, it is important for political leaders to educate themselves on the multiple and paradoxical realities of higher education. Encouraging all students to enroll in a public community college system for "free" may sound appealing on the campaign trail but are these institutions most able to help students succeed, especially those that are most at-risk? There really is no such thing as a free college education, as someone has to pay for professor salaries and building construction and maintenance. Performance-based funding is another topic that politicians need to thoroughly explore and reconsider. Does tethering state funding to institutional

graduation and persistence rates encourage these institutions to enroll and support

financially at-risk students? More research that considers macro-level financial policies

is needed.

Shared leadership becomes even more important when considering the collective

missions and objectives of private, four-year liberal arts colleges and universities nation-

wide, many of which have at least a historical denominational affiliation. Pearce and

Conger (2003) define shared leadership as a "dynamic, interactive influence among

individuals in groups for which the objective is to lead one another to the achievement of

group of organizational goals or both" (p. 1).   With over 1600 private, non-profit

colleges and universities nationwide, educating approximately 4.0 million undergraduate

students (NCES, 2020), it is crucial that leaders of these institutions band together to

influence both politicians and the national rhetoric on the merits of their education.

Likewise, politicians need to hold leaders of these institutions accountable for fulfilling

the missions and objectives that they promote. If diversity and accessibility are ideals

that are at the core of institutional missions, then institutional financial aid policies should

align with these principles and politicians should demand that they identify how they

support students with little or no ability to pay.

Discussion

In higher education settings, faculty, staff, and administrators focused on student

success are most often concerned with identifying which students have the highest

likelihood of dropping out (not persisting) so that they can potentially intervene with

institutional resources that will increase the chances of a student persisting. As mentioned

in the literature review, most of these interventions are focused on the first year of

enrollment for students, including summer programs prior to the first year of enrollment. Often these interventions are provided for students based solely on non-financial, pre-enrollment factors, such as standardized test scores, high school grades, and first-generation status. Hiring extra staff to implement a summer bridge program or hiring professional academic advisors may sound appealing to institutions trying to help at-risk students persist. However, these programs have a cost associated with them and at many small, private, enrollment dependent institutions, these costs are passed directly onto the students. If these interventions translate into students having larger RUFN, this could be a problematic intervention aimed at helping students succeed. As highlighted in this research, the financial reality for students is an important variable and needs greater attention. Adding RUFN to the model that included HSGPA, race/ethnicity, gender, and entry year increased the amount of null deviance explained in a statistically significant way for both 2nd fall and 3rd fall persistence.

While this research was conducted at a single institution and is not generalizable across all sectors of higher education, it showed that even after controlling for race/ethnicity, gender, entry year, *and* HSGPA, students that had a RUFN less than $5700 were 1.642 times as likely to persist into the 2nd fall and 1.460 times as likely to persist into the 3rd fall than students with a RUFN of more than $5700. This is a valuable insight in all sense of the word! As mentioned in the introduction, financial aid, in itself, is a response from institutions to the ideas of affordability and accessibility (McGee, 2015). Private institutions without massive endowments are competing for students that are willing and *able* to pay their cost of education. Students are able to do this through a combination of private and public sources of financing, from parents' savings accounts

and state sponsored 529 plans, to federal Pell grants and federal loans. However, the amount that students are required to "pay" is determined by the institutional discount rate, which is often simply an arbitrary reduction in the amount of tuition charged for the individual student. Institutions discount in a variety of ways and two common strategies are merit-based scholarships and need-based grants.

Based on the complex and confusing way that higher education is financed in the United States (Hossler, Ziskin, Gross, Kim, & Cekic, 2009), even students with a $0 expected family contribution (EFC) bring a significant amount of annual revenue to institutions of higher education without having to pay anything "out of pocket." Pell grants and federal student loans follow the student wherever they attend, so private and public institutions are able to benefit from this source of federal funding. If these high need students ($0 EFC) are willing to borrow the maximum amount allowed ($9500, see notes on Parent Plus Loan denials, page 75-76) and bring along a federal Pell grant ($6195 in 2019) and Supplemental Educational Opportunity Grant (SEOG, $2000 in 2019), they would contribute almost $18,000 a year in revenue to the institution they attend.

The obvious question for institutions that germinates from this important insight is, "What does it cost to educate a student at institution XYZ?" Is $18,000 enough? One assumption is that this amount of revenue is not enough for most private institutions, many of which have annual tuition and fees that exceed $50,000. If this amount is not enough, what is the minimum amount of revenue per student required to operate the institution? Sustained thinking connected to the previous questions will allow leaders to think more strategically about how their campuses recruit, admit, enroll, and support

students that are financially at risk. It may help institutions consider faculty and staff to student ratios that can realistically support enrolling students with low EFCs.

Tuition revenue is needed to cover the costs of operating an institution. Having a firm grasp not only on where tuition revenue is coming from but also where tuition revenue is going requires understanding how/where money is being spent at an institution. Most expenditures are related to personnel costs and administrative bloat is often blamed as one of the reasons behind large tuition increases (Simon, 2017). While Federal Department of Education regulations (Title IX, Clery Act, etc.) have contributed to the increased administrative costs, many institutions are simply being asked to "do more" for students and their families. Entering students expect to have modern and updated facilities, access to career and health related services, and student life offices that provide support for campus diversity initiatives (Kelchen, 2018). These increased expectations require additional and/or better trained staff to manage and run the various offices.

The idea of shared leadership at institutions of higher education has become increasingly important when viewed through the lens of what institutions are asking students to pay and how this impacts measures of persistence. As mentioned in Chapter 2, all leaders and decision makers that are part of the top management team (often the president's cabinet) should have a shared and symbiotic relationship when it comes to the ramifications of enrolling students with significant remaining financial need. Admissions personnel should not recruit students with zero or low EFCs if they will not be supported in realistic ways by the institutions they attend. Leaders should consider how solving problems can become especially difficult in an era of increasing institutional complexity

and formal structures that are most often organized according to specialties instead of tasks.

As a way for institutions to deal with complex environments, Ikenberry (1972) promoted the idea of task-oriented units that focus on a set of tasks instead of a specialized area of expertise. Selznick and Yoder (2019) used the idea of task-oriented units to consider what this would look like related to the functional domain of the student experience. Instead of having separate offices for admissions, financial aid, and retention, what if all three of these offices formed a new task-oriented unit focused on student success in the functional space? This unit would have a singular task—to ensure student success through a combination of recruiting students, ensuring their financial needs were met, and addressing retention concerns related to finances. This type of arrangement would require institutional leaders to reconsider traditional organizational structures and may help reduce ineffective and contradictory decision making due to the "garbage-can model" often associated with increased specialization on college campuses.

Understanding the impact that RUFN has on student outcomes should also extend to faculty and boards of trustees. Based on population trends, students will continue to come from less affluent and less academically prepared backgrounds. This reality will be especially true for institutions that are not considered elite and have traditional graduation rates of less than 80%, which is true for the institution used in this study, along with many of its peers in the small, private, liberal arts sector (Grawe, 2018; The 2015 Student Success State of the Union, 2015).

Higher education leaders, especially at private institutions, but also increasingly at public colleges and universities, need to continue to clearly articulate the rationale for

their institutional financial aid and the distribution of merit versus need-based aid. As

mentioned in the literature review, the idea of tuition discounting (differential tuition)

was once considered a progressive way to help increase access for higher need students

by charging those students with more means a higher rate of tuition. However, this logic

has been turned upside down at many institutions and it is the higher need, lower

academic students that are supporting the higher performing, lower need students and are

paying a larger share of tuition revenue (Wu, 2017). Leaders need to collect accurate data

regarding the types of students that enroll at their institution and measure how it impacts

both admissions and persistence trends. They should also be able to appropriately defend

any of their financial aid policies. Why is student A, who has a $0 EFC, being asked to

pay more than student B, who has a $20,000 EFC?

Returning to the ideas of affordability and accessibility highlighted in McGee's

book entitled *Breakpoint: The Changing Marketplace for Higher Education* (2015), the

futures of both students and the institutions they choose to attend are irrevocably and

intricately linked. In the face of declining state and federal support, stagnant average

family incomes, and increased competition in the post-secondary market, private (and

public) institutions need to be vigilant with respect to the student experience within the

functional domain and how it affects students, as proposed by Berger and Milem's

conceptual model (2000). Is it realistic for these institutions to expect students with

RUFN greater than $5700 to enroll and persist? This research shows that students with

large RUFN are significantly less likely to persist into both their 2nd fall and 3rd fall.

Institutions that are forward thinking and focused on long-term sustainability should do

everything in their power to ensure that students are not being asked to contribute more

than they are realistically able to pay. Failure to do so in consistent ways across all areas of campus will send the message to these students that they should not attend or persist at the institution.

Future Research

One variable that is sure to impact this study (and any other study looking at students' financial need) is that students with extremely high RUFN are able to pay for their college education if they have a parent/endorser that is willing and able to take out a federal Parent Plus loan or a private student loan. Federal Parent Plus loans are based on credit scores and parents that do not have adverse credit are often able to take out large PLUS loans. The credit check required for Parent Plus loans does not depend on a parent's ability to pay and the absence of credit history does not hurt parent applicants (Baum, Blagg, & Fishman, 2019). Even if a student has an expected family contribution of $0, if their parent does not have adverse credit, they can receive a Parent Plus Loan that covers their cost of attendance, often in the tens of thousands of dollars. At the institution used in this study, the largest RUFN was $19,848. This student most likely had an EFC of $0, which means that their family (at least on paper) does not have the means to provide any money towards their college education. However, this student could have had a parent that was willing to borrow this amount of money on an annual basis.

Future research that involves remaining unmet financial need could incorporate an additional variable that may produce meaningful insights: students with large amounts of RUFN that had a parent that was denied the Parent Plus loan. In this research project, this variable was not included. Another measure of persistence that should be investigated is the graduation rates of students and how RUFN affects this student

outcome. Finally, exploring interaction effects between GPA groups and RUFN could yield important insights. Does RUFN have a larger effect on measures of persistence for students in lower GPA groupings than students in higher GPA groups?

Conclusion

The results of this research confirm the results of a majority of the literature related to student financial aid and measures of persistence. Calls for more research investigating how unmet need influences student outcomes have been made (Mayhew, et al., 2016) and this research shows that higher levels of RUFN have a negative impact on student persistence, even after controlling for entry year, gender, race/ethnicity, and incoming academic variables (HSGPA). For every increase in $1000 of RUFN, students are less likely to persist into both their 3rd and 5th semester of enrollment. At the institution used in the study, a student with a $10,000 RUFN is only 0.637 times as likely to persist into their junior year as a student with a $0 RUFN, after controlling for entry year, gender, race/ethnicity and HSGPA. This finding is significant and deserves continued attention by researchers, politicians, and higher education faculty/staff/administrators.

This research also confirms the difficulty of attempting to measure the true ability/willingness of a student and their family to pay for their college education. While RUFN is certainly one measure of a student's financial reality, there are multiple factors associated with a student's ability and willingness to pay for college. These factors could include relatives, sponsors, or family friends that help with payments, a parent's credit score and willingness to borrow Parent PLUS loans or private student loans, and/or

outside scholarships (including military benefits and employer benefits) that may cover a large portion of the costs.

Finally, any isolated attempt by higher education institutions to help increase measures of persistence is likely to have a smaller impact than anticipated or desired by the leaders promoting the intervention (Burke, 2019; Fredman, 2019; Johnson, 2013). Whether this intervention is a first year seminar, intentional theme-based housing, or mini-grants aimed at covering small portions of a student's balance, these efforts are likely doomed to underperform in isolation due to the numerous factors involved in the persistence of students. If a student loves their housing situation but cannot afford to pay to live on campus, they may choose to attend a cheaper, community college after a year. If they can pay for their semester tuition but do not meet the academic requirements of their major program, then they may choose to transfer to another school where the requirements are less stringent. Decreasing a student's RUFN without any other form of academic or social support may not actually help with the persistence rates at an institution of higher education. Any attempt to increase the persistence of students should incorporate multiple vectors of intervention and should provide students with support in all three of the areas (academic, social, and functional) highlighted in Berger and Milem's framework.

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