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The Financial Nexus of College Choice and Persistence At For-Profit Institutions

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THE FINANCIAL NEXUS OF COLLEGE CHOICE AND PERSISTENCE AT FOR-PROFIT INSTITUTIONS

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Higher education is a trust market, in which the buyer has to trust that the product is what it seems. The student can't judge whether a curriculum and standards meets the expectations of employers, of a discipline, or of society, and they can't know whether it will meet the grander goal of tapping their full potential. To the extent students are able to judge their college educations, it occurs when it is far too late to get a refund.... Exploitation can occur in any sector, but the awesome power of the profit motive makes the scandals more likely and more audacious in the private sector.

Robert Shireman, Deputy Undersecretary, U.S. Department of Education, 2009-2010
(Shireman, 2012, p. 4)

Concern that [for-profit colleges] would necessarily exploit consumer ignorance to "rip off" potential students by providing poor quality in fly-by-night operations, while always a possibility and occasionally a reality, does not typify the majority of accredited, degree-granting, for-profit institutions. Indeed, a moment's reflection will suggest that any organization seeking to thrive in a market heavily influenced by word-of-mouth endorsements from existing customers has little incentive to defraud customers.

Earnings from learning: the rise of for-profit universities
(Breneman, Pusser, &Turner, 2006, p. x)

[When asked why they left,] students tell us what they think we want to hear…they don't want to hurt our feelings, so they tell us about stress, family obligations, or changing work schedules. Often we find out that they just don't like it here or that their actual experiences haven't matched up to their expectations.

Unnamed Dean of Student Affairs at a for-profit college
(Boice, 2010, p. 104)

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ABSTRACT

This study examined student persistence to attainment at for-profit institutions of higher education using the financial choice-persistence nexus theoretical framework (St. John, Paulsen, & Starkey, 1996). Nexus theory predicts that when students' experiences are not consistent with expectations, students perceive that their *implicit contract* with the institution has been violated and may choose to leave. This phenomenon has not previously been studied in the for-profit sector. This study examined how students' expectations of college, related to their choice of institution, subsequently impact their persistence decisions at for-profit schools, and how students' expectations affect the way that financial influences such as cost and aid impact student persistence.

These relationships were examined using data from the Beginning Postsecondary Students (BPS) survey for 2004-2009. By adding interaction terms to logistic regression models based on prior nexus research, the study examined both the main effect of the financial impact on college choice (FICC) as it related to persistence, and the moderating effects that FICC has on the relationship between financial variables and persistence. Regression models were applied to samples of students attending for-profit schools at the less-than-two-year level, as well as for-profit and non-profit schools at both the two-year and four-year levels. Where results from these initial analyses revealed similar significant interactions in both for-profit and non-profit samples at the same level, further analysis was conducted using combined-sector samples with three-way interaction terms

to examine potential moderating effects of institutional control (e.g. for-profit/non-profit) on these relationships.

Results showed no direct significant effect of FICC on persistence at for-profit schools but found that FICC moderated relationships between finances and persistence at less-than-two-year schools (loans), two-year institutions (tuition, loans, and grants), and four-year institutions (tuition). Combined-sector samples indicate institutional control moderates the nexus relationships between FICC, finances, and persistence for grants at two-year institutions and tuition at four-year institutions. Despite the presence of significant interactions and improved model fit using interaction terms, evidence of counterintuitive price-response behaviors and contradictory nexus relationships in different sectors suggest that the financial nexus theory does not sufficiently explain student persistence at for-profit institutions. Further examination of the nexus theory using academic and social nexus measures in addition to financial ones may benefit future research on student persistence.

TABLE OF CONTENTS

Acknowledgements iv

Abstract v

List of Tables ix

List of Figures xi

List of Abbreviations xii

CHAPTER 1: INTRODUCTION 1

Background 3

Purpose 5

Significance 7

CHAPTER 2: LITERATURE REVIEW 9

For-Profit Higher Education 9

College Choice 28

Research on Student Persistence 32

Nexus Theory of College Choice and Persistence 40

Summary 50

CHAPTER 3: METHODOLOGY 53

Data Source 54

Statistical Model 60

Statistical Analysis 77

Limitations and Delimitations 90

Summary 94

CHAPTER 4: FINDINGS 96

Logistic Regression Analysis 105
Summary of Findings 131
CHAPTER 5: CONCLUSIONS AND DISCUSSION 132
References 166
Appendix A: Tables of Descriptive Statistics and Logistic Regression Results 185

LIST OF TABLES

Table 3.1 List of Variables by Definition and Source 61

Table 3.2 List of Variables and Coding levels 75

Table 3.3 Summary of Models by Included Variables 82

Table 4.1 Logistic Regression Results for Less-than-two-year For-profit Institutions....107

Table 4.2 Logistic Regression Results for Two-year For-profit Institutions 108

Table 4.3 Logistic Regression Results for Four-year For-profit Institutions 109

Table 4.4 Logistic Regression Results for Two-Year Non-profit Institutions.....119

Table 4.5 Logistic Regression Results for Four-year Non-profit Institutions.....120

Table 4.6 Summary of Logistic Regression Results by Model and Sector 122

Table 4.7 Logistic Regression Results for Four-year Institutions, For-profit and Public Non-profit Sectors, Tuition Nexus 124

Table 4.8 Logistic Regression Results for Four-year Institutions, For-profit and Private Non-profit Sectors, Tuition Nexus 125

Table 4.9 Logistic Regression Results for Two-year Institutions, For-profit and Non-profit Sectors, Grant Nexus 126

Table A.1 Weighted Descriptive Characteristics for Study Sample Students at For-Profit Schools, Stratified by Institution Level 185

Table A.2 Weighted Descriptive Statistics for two-year and four-year Institutions, Comparison of For-profit to Non-profit.....188

Table A.3 (Full) Logistic Regression Results for Less-than-two-year For-profit Institutions.....192

Table A.4 (Full) Logistic Regression Results for Two-year For-profit Institutions.....194

Table A.5 (Full) Logistic Regression Results for Four-year For-profit Institutions 197

Table A.6 (Full) Logistic Regression Results for Two-Year Non-Profit Institutions.....199

Table A.7 (Full) Logistic Regression Results for Four-year Non-profit Institutions.....202

Table A.8 (Full) Logistic Regression Results for Four-year Institutions, For-profit and Public Non-profit Sectors, Tuition Nexus.....205

Table A.9 (Full) Logistic Regression Results for Four-year Institutions, For-profit and Private Non-profit Sectors, Tuition Nexus.....207

Table A.10 (Full) Logistic Regression Results for Two-year Institutions, For-profit and Non-profit Sectors, Grant Nexus 209

LIST OF FIGURES

Figure 4.1 Interaction Between FICC and Loans, Less-than-two-year For-profit Institutions.....113

Figure 4.2 Interaction Between FICC and Tuition, Two-year For-profit Institutions.....114

Figure 4.3 Interaction Between FICC and Loans, Two-year For-profit Institutions 115

Figure 4.4 Interaction Between FICC and Grants, Two-year For-profit Institutions.....116

Figure 4.5 Interaction Between FICC and Tuition, Four-Year For-profit Institutions.....117

Figure 4.6 Three-way Interaction Between FICC, Tuition, and Sector (For-Profit vs. Public Non-profit) at Four-year Institutions 128

Figure 4.7 Three-way Interaction Between FICC, Tuition, and Sector (For-Profit vs. Private Non-profit) at Four-year Institutions 129

Figure 4.8 Three-way Interaction Between FICC, Grants, and Sector (For-profit and Non-profit) at Two-year Institutions 130

List of Abbreviations

2YR-FP ..... Two-year, for-profit institution

2YR-NP..... Two-year, non-profit institution

4YR-FP ..... Four-year, for-profit institution

4YR-NP-PUB ..... Four-year, public non-profit institution

4YR-NP-PRI ..... Four-year, private non-profit institution

BPS ..... Beginning Postsecondary Students (longitudinal study)

FAFSA ..... Free Application for Federal Student Aid

FICC..... Financial Impact on College Choice

FPCU..... For-Profit College or University

FTBs..... First-time beginners (college students)

IPEDS ..... Integrated Postsecondary Education Data System

LT2YR-FP..... Less-than-two-year for-profit institution

NCES ..... National Center for Education Statistics

NPSAS ..... National Postsecondary Student Aid Study

TCU..... Traditional College or University (non-profit)

CHAPTER 1: INTRODUCTION

The number of college students attending for-profit institutions has increased dramatically over the last 25 years. In 2009, more than 1.8 million students attended for-profit colleges in the U.S., compared to just over 300,000 in 1986 (Bennett, Lucchesi, & Vedder, 2010). In the U.S., the percentage of college students enrolled at for-profit schools increased from 2.4% to 9.2% over this same time period. Recent estimates suggest the for-profit sector enrolls 10% of all college students in the U.S. (Wildavsky, 2011). As the role of these institutions in the higher education landscape grows, so does controversy over their quality of instruction (Kirp, 2003), their questionable recruitment practices (Kutz, 2010), and their ostensible conflict of interest between serving students' needs and maximizing profits (Ruch, 2001). Of particular concern to policymakers, for-profit schools account for a disproportionate amount of federal funding: In 2008, for-profit schools enrolled 7.7% of all postsecondary students in the U.S., yet these schools received 21.1% of Pell Grant funding, 21.3% of subsidized loans, and 22.4% of unsubsidized loans (Bennet et al., 2010).

As a result, policymakers are increasingly focused on for-profits' shortcomings on a variety of outcome measures. Students attending these schools have lower completion rates and higher student loan default rates than those attending public and private non-profit colleges (Deming, Goldin, & Katz, 2012). The for-profit industry, as a whole, falls short of their non-profit counterparts on most student success measures. In terms of

student persistence, one of the benchmark measures of institutional success, the gap between non-profits and for-profits is particularly glaring: Nationwide, the six-year completion rate of four-year degrees at for-profit schools is far below that of public colleges and private non-profits (Lynch, Engle, & Cruz, 2010). Defenders of for-profit colleges point out that such institutions admit low-achieving students that most non-profits will not, and thus lower persistence and completion numbers are to be expected (Kantrowitz, 2010). Whether this practice constitutes offering opportunity to an under-served population or whether it is a case of exploiting unqualified applicants for federal aid funding is widely debated.

Student persistence is one of the most important indicators of whether institutions are enabling students to succeed in their academic goals, and the for-profit sector of the American higher education system stacks up poorly on this measure. The specific reasons why are more elusive. Attrition may have negative effects on students themselves, as they can incur debt for which they complete no credential. It can also be costly to the institutions when these students leave (Noel-Levitz, 2009), as retaining enrolled students is less expensive than recruiting new ones. It is to the benefit of both students and institutions, then, to examine the reasons for low completion rates.

Research on student persistence holds value to the extent that it informs policy and practice that enables student success. Though degree completion is often a critical component in that success, it is not equivalent to success. Strategies for reducing student departure from an institution are incomplete without the academic progress that students make as a result of persisting (Spittle, 2013). Likewise, not every student decision to leave an institution constitutes failure. Students often change their degree or career plans

as a direct result of experiences that have less to do with disappointment than with seeing a new direction they want to pursue. Choosing not to persist at an institution can be a step in progressing toward the goal, very similar to switching from one major to another. In this situation, choosing to leave may not necessarily be any failure of the institution, but rather the student deciding they may initially be on the wrong career path (O'Keefe, Laven, & Burgess, 2011).

Students may choose to drop out or stop out from their educational pursuit for a variety of complex and interconnected reasons, and they may do so with the belief that leaving is in their best interest. However, if the reasons for leaving are related to the institution and program that they chose—that is, if it turned out not to be what they expected—then the issue of persistence may be tied to the student-institution interaction prior to enrollment as much as it is the experiences that occur after matriculation.

BACKGROUND

Whereas policy on institutions' eligibility for federal money is of obvious concern to taxpayers, it is arguably more impactful on the students who face financial difficulty or high loan payments, particularly if they drop out prior to completing their degree. Even when students drop out after their first year, they may find themselves no better equipped to find a job, but with large debt to repay nonetheless. Given the cost of higher education and the level of loans students frequently take, it is only appropriate to examine financial issues prior to students' leaving to determine what role certain costs played in students' decisions not to persist. Often, these are the same issues which students consider even earlier, when choosing which college to attend. For-profit colleges have been the target of accusations that they fail to deliver on the promises they make (Kirp, 2003; Kutz

2010). As has been pointed out in persistence research (Tinto, 1993), one of the key dynamics that contributes to student attrition is the degree to which a student's experience lives up to her expectations. If a significant financial burden accompanies student experiences not matching expectations, then the negative impact in the student may be even greater.

The nexus model of college choice and persistence (St. John et al., 1996) is the ideal framework for examining this problem. Research has widely treated these two areas as separate if related issues. However, the theoretical construct developed by St. John et al. treats these as two parts of a single decision-making process through which all students progress. In short, the same criteria which influence students' decisions to attend a particular school may later affect their decisions of whether or not to persist at that school. The theory suggests that students consider academic, social, and financial issues when deciding to attend an institution, and then re-evaluate these same issues based on their experiences after matriculating. The degree to which students' experiences live up to these initial expectations impacts decisions to persist or to leave. The pre-matriculation expectations are an implicit contract between the institution and the student. And if, on post-matriculation reflection, a student perceives that their experience is congruent with those expectations, they perceive the contract to be "inviolate" and choose to persist at that school (Paulsen & St. John, 1997).

Given the debate about whether for-profit schools mislead students in recruiting them (Kutz, 2010), it is appropriate to use a model that explicitly examines the consequences of inconsistencies between student expectations and student experience in order to investigate persistence at these institutions. While the academic and social

nexuses deserve attention in future research, an examination of the financial nexus as it affects students at for-profit colleges is most crucial since students attending these institutions incur higher levels of debt than their peers attending institutions in other sectors. And while previous studies have examined the financial nexus for other student populations at public and private non-profit schools, for-profits, to this point, have been ignored.

PURPOSE

The purpose of this study was to examine financial expectations of students attending for-profit institutions, how those expectations impacted their persistence directly, and how those expectations affected other financial influences on student persistence. This was done by testing the college choice-persistence financial nexus model on students attending for-profit institutions of higher education. No known prior studies of the choice-persistence financial nexus have examined this population.

Previous research has examined the financial nexus model in general (St. John et al., 1996) and also examined the model as it relates to several groups, including students at public and private institutions (Paulsen & St. John, 1997), community college students (Mbadugha, 2000), students of different socioeconomic backgrounds (Paulsen & St. John, 2002), and different races (St. John, Paulsen, & Carter, 2005). This study will seek to answer three research questions, based on the theoretical framework provided by earlier applications of the financial nexus model to other populations (St. John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005; Mbadugha, 2000; Hwang, 2003):

1. Does the impact of finances on college choice have a subsequent effect on students' persistence at for-profit postsecondary institutions?
2. Does the impact of finances on college choice moderate the relationship between financial experiences and students' persistence at for-profit postsecondary institutions?
3. Does the financial nexus of college choice and persistence differ according to institutional control (for-profit/non-profit status)?

All prior nexus studies have used versions of the National Postsecondary Student Aid Survey (NPSAS) to investigate the financial nexus for various groups. St. John et al. used NPSAS:87 in the original financial nexus investigation (1996), and subsequent studies followed suit (Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005). A dissertation by Mbadugha (2000) utilized NPSAS:87 to apply the financial nexus model to community college students, while Hwang's (2003) dissertation used NPSAS:96 to investigate the financial nexus for full-time, first-time, first-year freshman students. The current study used data from the Beginning Postsecondary Students (BPS) survey, a longitudinal study that followed students from 2004 to 2009. The NPSAS:04 served as the base year for the BPS:04/09 survey. No prior studies of the choice-persistence financial nexus have used this data set. Data sets used in prior studies could not be used for this study because they did not contain enough respondents attending for-profit schools. Although a more recent NPSAS version was available (2008), this version did not contain essential data related to students' college choices.

SIGNIFICANCE

The questionable practices of some for-profit institutions have brought the entire for-profit sector of the American higher education landscape under heavy scrutiny. Still, an increasing number of students, particularly those from non-traditional and under-served populations, are turning to for-profits to meet their educational and career goals. It is therefore important to know whether the opportunities these institutions offer can, in fact, enable students to reach those goals. To that end, federal policymakers continue to debate measures of control, like restricting the level of federal funding that for-profit colleges can receive, and requiring that schools document their graduates' achievement of "gainful employment" (Deming et al., 2012). This study will provide insight into the ways financial variables and students' expectations affect their decisions to persist in their academic pursuits, which should inform educators, administrators, lawmakers, and students in their decisions. Understanding student persistence at for-profit institutions is a concern for all these stakeholder groups.

This study is also an expansion of theory to a previously ignored population. St. John, Cabrera, Nora, and Asker (2000), in discussing the need for future research in college student persistence, point specifically to the need for researchers "to explore the role of the financial nexus in the persistence process because it is linked to the basic financial commitments colleges and students make to each other in the recruitment process" (p. 43). It is appropriate to explore the financial nexus model of college choice-persistence at for-profit institutions for two reasons: For one, the for-profit clientele is largely non-traditional, low-income students (Kantrowitz, 2010; Kinser, 2006a), and these students are more sensitive to the cost of higher education than traditional students

(Paulsen & St. John, 2002). Two, much of the criticism toward for-profit colleges pertains to recruitment practices that allegedly give students expectations about their educational experience which subsequently go unfulfilled (Lynch et al., 2010). The implicit contract between student and institution is the core of the nexus theory.

CHAPTER 2: LITERATURE REVIEW

While research has begun to examine for-profit schools in recent years, academic literature on these institutions remains relatively sparse. By contrast, student persistence and student development theory related to choice and persistence has received considerable attention. The first section provides background on the landscape of the for-profit sector of higher education, including its history; characteristics and predictors of the students that attend these institutions; and the recent controversies, in particular regard to federal funding. The subsequent section is an overview of student persistence research, including major theoretical contributions. The most relevant studies are those few that examine college choice and persistence among populations who choose for-profit institutions, as well as literature on a theoretical framework within the financial impact theories of student persistence called the "nexus" between college choice and persistence.

FOR-PROFIT HIGHER EDUCATION

Literature reviews of the for-profit sector have noted the dearth of available research on these institutions (Lechuga, Tierney, & Henstchke, 2003). However, the prominence of for-profit higher education in recent national education policy discussion and the increasing number of students attending these institutions has led to increased attention from researchers in the past several years. As a result, most of the available literature on for-profit institutions is relatively recent. Millora's (2010) overview

provides one of the best broad looks at the for-profit sector and the categories of literature available. In addition to covering studies on the history, diversity, student population, and faculty at for-profit institutions, Millora examines issues related to curriculum, accreditation, and accountability. She recommends future research consider the distinctions between training and education, and between the public and private benefits of postsecondary schools (Millora, 2010). Deming, Goldin, and Katz (2012) provide a comparably broad perspective of for profits institutions, including demographics, curricular trends, and outcome measures of student success.

The following section provides an overview of for-profit institutions, a history of for-profit education in the U.S., and examines the literature that exists on the types of students that attend these institutions.

DEFINITION AND DESCRIPTION OF FOR-PROFIT SCHOOLS

The primary focus of this study is the emerging sector of degree-granting, for-profit higher education that directly competes for students with degree-granting, non-profit institutions at all levels. However, the term "for-profit college" covers a broad spectrum, just as the category "non-profit college" includes community colleges, research universities, and elite private liberal arts schools. Research on for-profit postsecondary education often includes non-degree-granting institutions like job and trade schools (Kinser, 2006a), and the literature is rife with imprecise and inconsistent terminology (Millora, 2010). The terms "proprietary" and "for-profit" are frequently used interchangeably (Kinser, 2006a) despite the fact that large for-profit schools like the University of Phoenix more closely resemble major research universities than any

institution that would traditionally be considered a “proprietary” school (Ruch, 2001). According to the 1992 Higher Education Reformation Act, non-degree-granting vocational schools technically fall under the category of “higher education” where they might have once been differentiated by the term “postsecondary” (Kinser, 2006a). And yet, from a philosophical standpoint, generalizing all for-profits as “vocational” education is not necessarily an error, since “[t]he for-profit sector is made up almost exclusively of vocational institutions, in the sense that for-profit curricula are directed toward career preparation and advancement” (Kinser, 2009, p. 24).

The most straightforward definition of for-profit colleges—and the one used for the scope of this study—is in terms of Title IV funding eligibility. Though this delineation encompasses a broad range of schools, it is the most appropriate definition for an examining education policy and the way that policy affects students’ choices. Title IV funding eligibility requirements are now the same criteria which schools must meet in order to be included in the Integrated Postsecondary Education Data System (IPEDS). This criteria requires institutions (1) to offer associate’s or higher degrees requiring 300-plus clock hours of instruction, (2) to be accredited by an entity recognized by the DOE, (3) to have a signed agreement of participation with the DOE, and (4) to have been operational for two years or more (Ruch, 2001, p. 61).

The diversity among for-profit colleges is as great, if not greater, than that of non-profit institutions. Of the roughly 2,800 institutions meeting the criteria and receiving federal aid dollars, approximately half offer programs lasting two years or more (Millora, 2010). While for-profit institutions compete for students more directly with community colleges than any other type of institution, the similarities between their programming is

limited (Mullen, 2010). Associate degrees are offered at approximately half of for-profit institutions (Millora, 2010). More than 25% of degree-granting, for-profit institutions offer baccalaureate degrees (Millora, 2010), and larger for-profit universities like the University of Phoenix offer master's and doctorate degrees (Kinser, 2009). The existence of accredited schools offering degrees osteopathic medicine suggests that for-profit institutions offering medical degrees is not beyond the realm of feasibility (Shomaker, 2010).

DISTINCTIONS BETWEEN FOR-PROFIT AND NON-PROFIT COLLEGES

Several authors have offered comparisons between for-profit colleges and universities (FPCUs) and traditional colleges and universities (TCUs). Though these descriptive works typically are not research-based, they offer valuable context for a study like this one. Kinser, for example, has published several works examining FPCUs that offer specific distinctions between the for-profit and non-profit sectors. He notes that for-profit schools differ from non-profit schools to a greater extent than simply having a profit motive. The NCES defines proprietary schools as private institutions in which "the individual(s) or agency in control receives compensation other than wages, rent, or other expenses for the assumption of risk" (Kinser, 2006a, pp. 7-8). Also, non-profits are only permitted to further educational or research goals of the organization, while for-profits may allocate revenue anywhere (Kinser, 2005, 2006a, 2006b, 2007, 2009).

In a 2009 working paper, Kinser also emphasized that for-profit schools are *not* defined as such because they take in more money than non-profits. Public colleges, on average, make a "profit" (that is, the level of revenue in excess of expenses) on par with that of for-profit schools; private colleges make an average of three times that amount

(Kinser, 2009). The major distinction is by tax status: While public and private, non-profit institutions are not required to pay the same taxes to which for-profits are subject, there are restrictions on how non-profit institutions may spend revenue in excess of expenses (Kinser, 2009). For-profits are more dependent on tuition as a source of revenue than public and private, non-profit colleges, and students attending these institutions are much more dependent on federal grants and student loans than students at other institutions (Kinser, 2009). He concludes that for-profits do offer alternative paths to access for an underserved population of students, but acknowledges the constraints of program offerings and personal cost (primarily via federal loans).

As far back as 1999, Winston compared for-profit and non-profit models of higher education in terms of whether some non-profit schools were vulnerable to the emerging for-profit sector. He noted, even then, the heterogenity of for-profit institutions and the increasing range of educational programs that were emerging. He further predicted that this increased diversity would increase also among the non-profit institutions whose student subsidy was not necessarily attractive enough to compete with the for-profit offerings.

Others have examined the differing structure between for-profit institutions and non-profits, including contrasts in the roles of various stakeholders. Breneman, Pusser, and Turner (2006) examined the for-profit sector from a perspective of theory, practice, and political economy. They defended the for-profit model as a viable structure for delivering education and lauded the sector as a whole for its student-centered approach. Also, they noted that neither delivery of services, such as distance learning, nor accreditation distinguished non-profits from for-profits, as the former have increasingly

embraced online education formats while the latter has achieved approval of many regional accrediting bodies.

Tierney and Hentschke (2007) echoed Breneman, Pusser, and Turner's position that there is room in higher education for multiple types of models and structures, as different models more effectively serve different populations of students. Tierney and Hentschke noted distinctions between the way that for-profits view both students and faculty. In contrast to TCUs, which maximize the caliber of student body within their capacity, FPCUs focus on profitability and growth, which inevitably makes academic ability of secondary importance. Also, faculty involvement in governance is far less common in FPCUs, where faculty's primary (and often only) responsibility is teaching (Tierney & Hentsche, 2007).

Lechuga (2008) conducted a series of interviews with faculty at FPCUs to "examine the culture of the faculty as a means to explore the environmental forces that shape their work roles and responsibilities" (p. 289). The results confirmed earlier findings that faculty have less autonomy and institutional authority. Academic freedom was described as "contextual," and centralized, corporate-style governance limits faculty roles to student service. Even programmatic decisions are overseen by review boards. A far cry from the tenure model, for-profit faculty often must undergo performance reviews (Lechuga, 2008). Lee and Topper (2006) came to similar conclusions in an examination of proprietary schools in the U.S. They observed that FPCUs adhere to a business model rather than a mission or tradition, and as such eschew many traditional academic freedoms given to faculty, such as tenure and curriculum selections. Also, proprietary schools typically do not emphasize liberal arts content, though many may offer degrees in

subjects such as psychology, and proprietary schools are frequently more geared toward access to all students, especially non-traditional, in the timing of course offerings, admission requirements, and flexibility in enrollment. All three of these features are a reflection of the profit motive and the organization conforming to its customers' demand (Lee & Topper, 2006). Ruch (2001) asserted that, while business and academic cultures often intertwine at for-profit colleges, the organization and governance in specific departments and instructors in the classroom resembles the academic culture of most colleges; the business culture, usually seen only at the board level of non-profit schools, is more prevalent at the provost and academic dean level.

Garrity, Garrison, and Fiedler (2008) examined changes in attendance at for-profit schools related to Pell grant levels in 1993, 2000, and 2004. They found that, in addition to rapidly rising populations at for-profit schools, these institutions take in considerably more in Pell grant dollars per FTE than similar non-profit institutions. Additionally, 4YR-FP institutions are increasing in enrollment most quickly, while at the same time serving a smaller proportion of minority students than for-profit institutions at lower levels. As a result, the authors caution that the Pell grant discrepancy is driving a segregation of sorts that may deny traditionally disadvantaged students some of the social benefits of traditional higher education.

HISTORY OF FOR-PROFIT EDUCATION IN THE U.S.

Several publications have included overviews of the development of for-profit schools through the twentieth century (Ruch, 2001; Hentschke, Lechuga, & Tierney, 2010). In their overview of the sector, Bennet et al. (2010) trace the history of for-profit higher education back to nineteenth-century for-profit business schools The most

notable expansion of the for-profit sector of postsecondary institutions was following World War II when the GI bill provided funding for veterans to attend college (Bennet et al. 2010). The industry experienced another boom in 1972 following the Higher Education Act that year that permitted tuition subsidies to be used at proprietary schools . This also produced a number of instances of sham colleges and "diploma mills" which used students to access the readily available federal funding without delivering quality education in return. However, increased regulation during the 1980s, including accreditation requirements, eliminated most truly illegitimate schools (Bennett et al., 2010).

Expansion. By 1986, proprietary schools (including non-degree-granting institutions) comprised approximately one-half of all postsecondary institutions, despite serving only about 5% of all undergraduate students in the U.S. (Apling, 1993). Since then, the for-profit sector of the American higher education system has expanded far faster than the non-profit side. From 1986 to 2008, the average annualized rate of increase in student enrollment in the U.S. was 1.6% for public colleges, 1.4% for private non-profits, and 8.4% per year for for-profit schools (Bennett et al., 2010). As a frame of reference, in 2010 there were more students enrolled at the University of Phoenix, the largest for-profit institution in the U.S., than were enrolled in the entire for-profit sector in 1991 (Lynch et al., 2010). Much of this enrollment increase is a direct result of for-profit institutions' increased offerings of online and distance education (Deming et al., 2012).

In 1996, the Integrated Postsecondary Education Data System (IPEDS) changed the way it defined institutions of higher education—specifically, in terms of Title IV

funding eligibility (Ruch, 2001). The net result of this change is that data on for-profit institutions, previously unrecognized as true accredited *colleges* despite some having regional accreditation, became part of the IPEDS database (Ruch, 2001) collected and maintained by the National Center for Educational Statistics (NCES). In the first year these new criteria went into effect, the number of eligible institutions increased by 7.5% due to the new definitions alone (Ruch, 2001).

STUDENTS ATTENDING FOR-PROFIT COLLEGES

The few studies which rightly qualify as research on for-profit institutions are primarily demographic examinations of their student populations. Between the 1972 Higher Education Reauthorization Act, which provided additional funding for students attending for-profit schools, and the beginning of the "Wall Street era" in the early 1990s (Kinser, 2006a), the available research on for-profit schools shows that they catered primarily to students from a specific demographic profile. Kinser found that, in addition to being older and more financially independent from their parents than average college students, students that attended for-profit colleges "are more likely to be minorities from low-income backgrounds with lower tested abilities and weaker academic backgrounds than students in not-for-profit private and public institutions" (2006a, p. 69). For-profit student demographics vary by study. Phipps, Harrison, and Merisotis (2000) examined the demographic characteristics of students at less-than-two-year, two-year, and four-year institutions between 1992-93 and 1995-96. They found similarities between students at less-than-two-year and two-year schools and students who attended non-profit schools at the same level, but marked differences in populations at the four-year level. In general, students attending for-profit schools are more likely to be non-traditional, and,

historically, proprietary college students are more likely to come from low-income families (Apling, 1993). Phipps et al. found for-profit students at the less-than-two-year and two-year level more likely to be independent, but also found higher rates of white and female students. Students were actually more likely to be under age 23 (Phipps et al., 2000). Later studies supported this finding, but found that students at four-year institutions were more likely to be men (Millora, 2010). Also, students attending 4YR-FPs are more likely to be among the highest income quartile and less likely to be from the lowest quartile than students who choose to attend two-year for-profit institutions (Millora, 2010).

Chung has explored several aspects of the ways that students attending for-profits differ not only from students attending non-profit schools, but also differ across levels within the for-profit sector. Chung (2004) used data from NPSAS 1996 and NPSAS 2000 and found that female, Black, and Hispanic students are more likely to enroll in for-profit colleges, as were students who had lower high school GPAs and earned a GED or no high school diploma. Further investigations have found that students attending four-year, two-year, and less-than-two-year proprietary colleges come from statistically distinct populations (Chung, 2004), underlining the heterogeneity of both for-profit institutions and the students attending them. This more recent study also found that students attending for-profits were more likely to be younger (less than 24), supporting findings by Phipps et al., and students were more likely to attend school full time. Additionally, Chung found evidence that disadvantaged students attend for-profits schools more frequently. Characteristics which are often associated with a lower likelihood of attending college—Hispanic students, students from low-income families,

and students whose parents' education level is below high school, and students who are single parents—are associated with a higher likelihood of attending a proprietary institution among students from those groups who do attend college (Chung, 2005). This last finding was supported by Persell and Wenglinsky (2004). However, a later study by Chung (2008) using NELS:88 data found that students that chose to attend for-profit schools, on average, performed lower on cognitive measures than other students and were limited by family resources and parent involvement.

Deming et al. (2012) included an examination of student characteristics within their sector overview. While students at for-profits are, on average, older than traditional college students, they are younger than the average community college student, which may be a result of recent increases in the number of younger students attending (Deming et al., 2012). For-profit students are differ from the populations of community colleges, despite their institutional similarities. As Deming et al. noted, "Compared to those in community colleges…, for–profit students are disproportionately single parents, have much lower family incomes, and they are almost twice as likely to have a GED" (2012, p. 9). Proprietary school students choose these institutions for financial aid, school reputation, desired courses, and job placements, while community college students report choosing their institution because of lower tuition, the need to balance work with school, and being able to live at home (Deming et al. 2012).

Other studies have drawn similar comparisons on the sector as a whole, not just two-year institutions (Zamani-Gallaher, 2004). Morey (2004) found that almost half of proprietary college students attend part time, and 60% work at least part time while attending school. Citing Levine (1997), Morey notes that these increasingly

nontraditional students have expectations of college that for-profits more readily provide: convenience, quality, shorter time to completion, and flexibility. Also, for-profits may accept students who would not be accepted elsewhere (Morey, 2004). In a 2009 study of California community college student transfers, Sheldon found that student transferring to 4YR-FP schools were more likely to be students of color, more likely to be part-time students, more likely to have a lower GPA, and more likely to have attended community colleges with low overall transfer rates.

RECENT CONTROVERSY

Much policy discussion in the last ten to fifteen years regarding higher education reform has centered on for-profit schools. Some traditional academics have argued that the profit motive, as a type of "corporate interest," is inherently inconsistent with the core mission of higher education (Berg, 2005). In addition, recent reports have identified areas in which for-profit institutions appear to perform poorer than their non-profit counterparts: (1) questionable recruiting tactics and assurances about future employment; (2) the quality of instruction and student experience; and (3) poor student success outcomes, debt, and default rates relative to public and private non-profit schools.

Questions about recruiting tactics and program quality. Critics of for-profit institutions have accused them of questionable recruiting tactics (Lynch et al., 2010). An August 2010 GAO report found evidence that for-profit colleges engage in deceptive recruiting strategies, including misstating institutions' graduation rates, placement rates, and the level of income students would likely be able to obtain upon graduation (Kutz, 2010). Auditors posing as prospective students made inquiries to 15 for-profit colleges and reported that all 15 provided some misinformation to students that made the school

appear more attractive or less expensive than they actually were. The report also reported that four of the schools encouraged the undercover auditors to commit fraud by falsifying their financial aid application to increase the amount of federal aid for which they were eligible (Kutz, 2010). However, the GAO released an update in November 2010 which corrected a number of errors in the original report (Anderson, 2010), fueling controversy over whether the original report was biased against the institutions being investigated (Lederman, 2010).

Wildavsky (2011) acknowledged that there are examples of student exploitation, but that these incidents (and the institutions which commit them) are the exception to the rule. Bennett et al. (2010) second this assertion, and further pointed out that the "diploma mill" reputation of modern for-profits is unfounded (Bennett et al. 2010) since, just as Kinser reported (2006a), investigations during the late 1980s and policy reform like the 1992 Higher Education Act closed loopholes and put most illegitimate operations out of business. Still, much of the concern over for-profit institutions' use of federal funds is based on the belief that they do not provide quality educational experiences for their students. There remains "a central concern expressed by traditional academics about for-profit institutions—that quality is negatively influenced by profit motive" (Berg, 2005, p. 17).

It is difficult to compare academic curriculum between for-profit and non-profit institutions, given the different philosophies, missions, and models within both groups. The debate over whether career-oriented education constitutes "higher education" (Kinser, 2006a), suggests that differences in program composition alone may prevent any direct comparison of quality between a proprietary school and a liberal arts college or

research university. It is only possible to compare measures of student outcomes at these different schools.

Student outcomes. Much of the criticism and scrutiny of for-profit colleges is a result of poor measures on student success, like program completion and debt level, compared to their non-profit counterparts. Lynch, Engle, and Cruz (2010), in a scathing examination using IPEDS and NPSAS data, found that for-profit institutions compared unfavorably on most such measures. Even Bennett et al. (2010), in a much more favorable examination of the for-profit sector, acknowledge that completion percentages are lower at for-profit schools, and students attending for-profits have higher default rates than at public or private non-profit schools. However, others have pointed out that comparisons of raw scores may not account for the variation in demographic and socioeconomic populations that attend different types of schools (Kantrowitz, 2010a; Kantrowitz, 2010b). As Chung (2005) noted, disadvantaged populations are more likely to receive federal aid, and they comprise a larger proportion of enrollments at for-profit schools; criticisms of poor student outcomes at for-profit schools often fail to account for this selection bias.

Several studies have examined how administration and student affairs efforts at for-profit schools pursue student success (Kinser, 2006b; Lechuga, 2008). Kinser (2006b), in describing student affairs practices at 17 institutions, reported that (1) that student affairs is a core institutional function at these schools, (2) their primary goal is in fact to assist students in persisting and completing, (3) their services are designed in regard to non-traditional student populations, (4) there is a focus on the learning experience outside of the classroom, and (5) convenience to the student is a high priority.

However, institution-specific examinations of student success at for-profits have provided mixed results of the degree of effectiveness of these efforts. For example, Bush (2010) conducted a qualitative study which surveyed students at a for-profit college on their goals and how their institution enabled them to succeed at those goals. The study found that students valued knowledgeable instructors among the most important elements to success and that the institution had heavily integrated the most relevant practices that students associated with success. A similar study on attrition at a two-year career college found that there were significant differences between the traditional and non-traditional students (Boice, 2010). Non-traditional students had lower expectations of success, lower perceptions of self, and reported lower levels of support from family, instructors, and student supports staff. Students attending for-profits also showed lower levels of civic engagement than students attending other institutions (Persell & Wenglisnsky, 2004).

Completion rates. Lynch et al. found that students attending four-year, for-profit colleges are less likely to graduate within six years than students attending four-year public and private non-profit colleges. However, students attending two-year and less-than-two-year for-profit schools are actually more likely to graduate within 3 years than students in two-year programs at community colleges (Lynch et al., 2010). Deming et al. (2012) found that attending a for-profit school is associated with high levels of first-to-second year retention and greater likelihood of completing an associate's degree, but lower likelihood of completing a bachelor's degree. Kinser (2006a) observed that two-year for-profit schools have historically had higher completion rates than competing public institutions. However, this trend may reflect the fact that students attending two-

year for-profits intend only to earn an two-year credential, while students attending public two-year institutions often intend to transfer to four-year programs , which would count as non-completion.

Lynch et al. (2010) found that while students from disadvantaged populations are more likely to attend for-profit schools, this does not fully account for the lower completion rate. The six-year completion rate at 4YR-FP schools remains well below non-profit schools even when compared to like institutions. Lynch et al. found that schools where 67% or more of admitted students receive Pell Grants have comparably low six-year completion rates (between 27% and 33%), regardless of whether they are non-profit or for-profit. However, the graduation rates for for-profit schools in the middle (34% to 66%) and lower (0% to 33%) thirds of Pell Grant recipient percentiles have six-year completion rates roughly half that of public and private non-profit schools (2010).

While the overall completion rate at for-profits lags behind public and private non-profit schools, the completion rate for specific disadvantaged populations is actually *higher* at for-profit institutions. St. John, Starkey, Paulsen, & Mbadugha, (1995) found that attending a for-profit college is associated with higher persistence levels among African Americans, Hispanics, and students who achieved GEDs rather than a traditional high school diploma. Both enrollment and retention rates for theses populations are higher at for-profit schools. This finding supports the notion that for-profit schools expand opportunity for underserved populations, and suggests that losing Title IV eligibility for these institutions might disproportionately affect disadvantaged students (St. John et al., 1995).

Default rates. As with completion rates, the composition of students from at-risk populations explains some, but not all, of the difference in default rates between for-profit and non-profit colleges. The three-year default rate (defaulting within three years after entering repayment) at for profit schools is 19%—roughly double the combined default rate at all other institutions (Lynch et al., 2010)—and has increased sharply since 2006, as reported by Deming et al.(2012). As Lynch et al. further note, "for-profits represent 43% of all federal student loan defaults, even though they make up only 12% of enrollments and 24% of federal loan dollars" (2010, p. 6).

Kantrowitz (2010a) analyzed data from the U.S. Department of Education and found that specific non-institutional risk factors associated with failure to persist—including working while enrolled, part-time-only enrollment, and being a single parent—account for 38.6% of the difference between public and for-profit default rates and 60.1% of the difference between private non-profit and private for-profit default rates. A subsequent analysis adjusted default rates by comparing rates only between groups of like students, at-risk or not-at-risk, using Pell Grant recipient status to define students as at-risk (Kantrowitz, 2010b). While default rates are much closer in this type of comparison, the default rate for students attending for-profit colleges is still higher. Deming et al. also found that controlling for student demographics and other institution-specific characteristics made only a small difference in the loan default percentage gap between for-profits and other institutions (2012).

Debt level. Deming et al. (2012) found that students attending for-profit institutions also accumulate more debt than students at other schools. Students attending for-profits take out more loans to cover higher levels of unmet need. Based on 2008 data,

Lynch et al. (2010) found that the level of unmet need for students at four-year colleges is two-thirds higher at for-profits (nearly $25,000) than at private non-profits (roughly $16,500), and nearly triple the level at public schools (just under $8,600). For the same cohort, the level of debt at graduation for those attaining bachelor's degrees is roughly $31,000 for for-profit students, $17,000 for private non-profit, and $8,000 for public (Lynch et al. 2010). This discrepancy, combined with the fact that for-profit students do not have higher projected earnings than non-profits, suggests that for-profit schools may have difficulty meeting the new "gainful employment" regulations for Title IV eligibility, which require student loan payments not to exceed a given percentage of students' annual earnings or discretionary income (Deming et al., 2012).

Job placement rates. A comparison of job placement rates and return on investment (ROI) between for-profit colleges to those of public and private non-profit schools would be useful and relevant, particularly given the controversy surrounding the "gainful employment" policy for federal funding. However, while schools are required to provide graduation rates to potential students (Kutz, 2010), there is not sufficient industry-wide data to make a valid comparison between institution types (Bennett et al., 2010). There is little recent research on placement rates of for-profits, aside from the self-reported placement rates among some of the largest for-profit operations, which are typically high. Devry, for example, boasts a placement rate within six months of graduation of better than 90% (Bennett et al., 2010; Morey, 2004).

In terms of economic returns, Persell and Wenglinsky (2004) summarized the findings of earlier studies which indicated that attendance at proprietary schools was not associated with higher economic benefits. However, given the variability of the

institutions examined, and given the positive economic returns found in earlier studies of specific institutions, the negative association may not be representative of the industry as a whole (Persell & Wenglinsky, 2004). Also, older studies cited by Persell & Wenglinsky suggest that proprietary school attendance is associated with higher wages but, paradoxically, a higher rate of unemployment (2004). Lee and Merisotis (1990) compared the for-profit sector, then predominatly less-than-four-year institutions, to the community college system. They found that for-profit schools did boast higher completion rates than community colleges as a whole, but that unemployment was still higher for students graduating from FPCUs. Persell and Wenglinsky also found evidence that, economic benefits aside, proprietary school students show lower levels of civic engagement than students attending other types of institutions.

Student satisfaction. There is limited available independent data on student satisfaction with for-profit schools' course of study. However, recent data from the Beginning Postsecondary Student Longitudinal Survey (BPS:04/09) suggests that for-profits do not compare favorably with public and private non-profit schools, particularly from a financial perspective, and that this dissatisfaction may be related to lower long-term persistence:

> Students who began in for-profit colleges are…less likely to state that their education was worth the amount they paid and are less apt to think their student loans were a worthwhile investment. Even though the for-profits have higher short-run retention of students, their students are more likely to leave their certificate or degree programs before completion because of dissatisfaction with the program. (Deming et al., 2012, p. 21)

Since students at for-profit schools are more likely to be non-traditional and at-risk, failure to complete a program may be a result of numerous contributing factors. However, anecdotal evidence from at least one study of attrition at a two-year proprietary school suggests that student dissatisfaction is both common and underreported cause of leaving (Boice, 2010).

COLLEGE CHOICE

The process of choosing a college has changed dramatically over the last 50 years with federal education policy designed to increase access (Kinzie, Palmer, Hayek, Hossler, Jacob, & Cummings, 2004). Most research on financial aspects of college choice pertains to access and enrollment. However, several studies worth noting have examined price-response behaviors and student expectations. Heller (2001), as part of an enrollment study on California college students, outlined a series of assumptions on student choice behavior based on prior research reviews by Jackson and Weatherby (1975), Leslie and Brinkman (1988), and Heller (1997). These assumptions included basic economic characteristics of college choice as being responsive to prices and aid, and lower-income students being more sensitive to price differences. However, there were also less intuitive findings. Equivalent changes in net price may affect students differently depending on whether they affect cost or aid or even which *kind* of aid changes (Heller, 2001). All else being equal, student enrollment responds to grants more strongly than other kinds of financial aid. Also, one sector can be affected by policy changes in another (Heller, 2001).

Available research has examined student responses to these different sources of aid. McDonough, Calderone, and Purdy (2007) compared eleven states' grant aid program. As states' higher education policies are dependent upon the particular needs of that state, the foci of each state program, such as proportions of grants that are merit-based and need-based, vary widely. McDonough et al. caution against direct comparisons of impact. At the institution level, Hurwitz (2012), examined student response to institutional grant aid and found a small percentage predicted increase in the probability of enrollment—referred to as "college-choice elasticity" (Hurwitz, 2012, p. 3)—given an increase in grant aid offered. The strength of this association varied by income level. However, Hurwitz only examined applicants to 30 highly selective institutions.

Kim (2011) examined NELS:88/2000 data to determine the effect of state financial aid policies on students' college choice. Results showed that the availability of need-based grants affected ethnicities differently. For African American and Hispanic students, there is actually a negative association between state grants offered and probability of enrollment. This suggests that policies designed to bridge gaps for disadvantaged populations may not be succeeding in their intended goal (Kim, 2011). By contrast, Long (2007) examined the role of loans in enabling access by examining college enrollment changes following the increase in loans levels following the 1992 reauthorization of the Higher Education Act. She estimated the change in eligibility for federal loans using home equity, which prior to 1992 was used in the formula for family eligibility. She found that the increase in enrollment among newly eligible families suggests that the 1992 HEA did increase access for a large number of students.

Lillis and Tian (2008) surveyed 289 students on the factors which affected their college choice. They found significant interactions between tuition level and each of the following: income level, scholarship sensitivity, and financial aid sensitivity. Though other influences moderated college choice, cost appeared to limit low-income students' choices regardless of other factors. Perna and Steele (2011) explored "context" that affects the impact of financial aid on student enrollment. They used case studies of high school students from five states to examine the perceptions and expectations the students formed about higher education, and how these shaped their decisions. Perna and Steele suggested that perceptions about financial aid might be more important than the aid itself (2008).

Finances may also impact student expectations in different ways depending on student background. One Australian study showed that students' expectations of college are shaped by their socioeconomic background, where socioeconomic background was defined exclusively in terms of parental education level. Richard James (2002) surveyed 7,000 high school-age students and found that lower socioeconomic background students were more likely to perceive inhibiting factors to pursuing postsecondary education such as lack of confidence in family support, desire not to delay income, and concern regarding the cost of school. There were also drastic gender differences among the responses; females showed more positive outlook on most items (James, 2002). Similarly, Kim, DesJardins, and McCall (2009) studied the differences in response to financial aid among various racial groups, using data over a four-year period at the University of Iowa. They modeled probability of application, admission, and enrollment based on student background and aid package. They found that response to aid package,

relative to the level of aid expected, varies by ethnicity. Nurnberg, Morton, and Zimmerman (2012) conducted a predictive study on a single institution using data over a four-year period to create a model of prediction of enrollment from among all accepted students. In addition to significant relationships with student demographics, academic background, and net price as other studies have show, Nurnberg et al. found students' interests (both academic and extra-curricular), to significant predictor of enrollment.

Student choice to attend two-year colleges has been examined at both the national level and state. Stokes and Somers (2009) used NPSAS:96 data to examine predictors of student enrollment in two year schools, including student background and institutional characteristics. After using an ANOVA on BPS:88 variables to develop a model of best fit, they conducted a logistic regression analysis where the outcome variable was two-year or four-year institution selection. While student ethnicity and academic preparation were significantly related to the outcome, cost variables and campus climate also predicted enrollment. Barreno and Traut (2012) surveyed students at a Texas community college on their main criteria for school selection. Though cost was among the top reasons, programs offered, program quality, and course transferability were the most commonly cited reasons for enrolling.

One study has examined student choice to attend for-profits in particular. Chung (2012) examined NELS:1988 and PETS:2000 data to examine whether enrollment in for-profit schools was incidental or whether students chose those institutions for some specific reason intrinsic to the school itself. Over and above demographic and socioeconomic factors which predict higher enrollment at for-profit colleges, she found

that geographic concentration of such schools was related, as was tuition charged by competing community colleges (Chung, 2012).

RESEARCH ON STUDENT PERSISTENCE

Literature on student departure dates back to the early 20th century. Braxton et al. (2000) traced research back to Summerskill (1962) and Pantages and Creedon (1978) and cited their literature reviews which included research as early as 1926 (Johnson). Student attrition is relevant to researchers exploring how college experience affects students and the decisions they make (Pascarella & Terenzini, 1991, 2005), as well as to practitioners seeking institutional strategies for improving retention (Seidman, 2005). While researchers have drawn from research in a variety disciplines to explain the student departure process, most models fall into one of two categories: social-psychological, or economic. Social-psychological models of student departure describe attrition as a failure of student integration as a result of their experience in the college environment. Models rooted in economic theory see student decisions as form of cost-benefit analysis. Some recent models have attempted to merge the two.

SOCIAL-PSYCHOLOGICAL THEORIES OF STUDENT ATTRITION

The 1970s and 1980s saw the emergence of several of the most influential studies on college student persistence. Spady (1971) developed a theory of student departure and empirically tested a model based on students' background and the ways in which their previous experiences, particularly academic success, affect their integration into the college environment. Astin's (1977; 1983) theory of student involvement similarly

argued that a student's likelihood of persisting was a direct function of her involvement in the campus community. Tests of the corresponding model found that student back ground and institutional characteristics, as well as "fit" between the two, were associated with student persistence.

Tinto model. A social-psychological model of student persistence developed by Tinto (1975) provided the basis for a number of more recent studies. Drawing from Astin's involvement-based and Spady's integration-based theories of persistence, Tinto's model of student departure closely resembles the Durkheimian model of suicide, which states that a person's choice to commit suicide was a result of "lack of integration" into society (Durkheim, 1965). Tinto claimed that students' decisions to leave college follow a similar, albeit less drastic, process to a suicidal individual's decision to "leave" the world: Students' lack of academic and social integration at a college is associated with their decision not to persist at that school (Tinto, 1975). Tinto's later research indicates that social and academic integration is positively associated with student persistence (1993), and more recently he has examined the role of classroom-level interventions in student persistence (2012)

The Tinto model, despite its significance, has come under heavy scrutiny in persistence research (Braxton et al., 2000). Empirical tests of the theory have not been compelling (Braxton, Sullivan, & Johnson, 1997). One primary criticism of the model is that it failed to include any type of financial consideration. Tinto initially dismissed the idea that finances would play a significant role in persistence decisions. He even asserted that when students cited finances as a reason for departure, this was probably an excuse provided to rationalize a more personal academic or social disappointment (1993).

However, Tinto does acknowledge the role that expectations play in college students' opinions about the schools they choose: "Pre-entry expectations generally become the standard against which individuals evaluate their early experiences within the institution. When expectations are either unrealistic and/or seriously mistaken, subsequent experiences can lead to major disappointments" (1993, p. 54).

Among the research exploring Tinto's attrition model are a series of studies by Pascarella and Terenzini (1979; 1980; 1983; 1991; 2005). Their early findings (1983) supported the idea of institutional "fit" playing a significant role in students' decisions to persist, though their later work identifies gender interaction, for which the Tinto model did not account. Social interaction is more significant for female students, while academic integration is more significant for male students. However, several studies have identified shortcomings with Tinto's integration theory. Tierney (1992) identified several problems with Tinto's model, including the fact that the conceptual framework of integration was discriminatory toward minority students. Also, Tinto's models and empirical tests are based on traditional students at four-year institutions. Bean and Metzner (1985) found in particular that many external factors, which Tinto's model failed to account for, can significantly affect student persistence.

Bean model. The major competing social-psychological model to Tinto's was Bean's (1980), which included financial variables in student background, in addition to the social and academic measurements. While Tinto's model was based on suicide theory, Bean's model of student departure is more associated with employees' decision to leave an employer. More notably, the model included external variables, including financial need, in addition to personal and social ones in the Tinto model. Bean's

framework links students' experiences, beliefs, attitudes, and behaviors in a sequential causal relationship (Metzner & Bean, 1987). Bean's model does not, however, consider the role that finances may have played in students' college choice (Mbadugha, 2000).

Bean and Metzner (1985) further developed this model to include nontraditional undergraduate students, who were believed to be less integrated into the college environment. The new model included age as a dichotomous variable (24 or younger, 25 or older), whether or not student resided on campus, and whether students were full-time or part-time. In addition to the external factors in the previous model, which often affect non-traditional students to a greater extent than traditional undergraduates anyway, these three factors were believed to be issues which would affect persistence for the non-traditional student. Bean and Metzner found that the environmental factors were significantly, though indirectly, associated with attrition (1985).

Merging Bean and Tinto. Cabrera, Castaneda, Nora, and Hengstler (1992) tested the Tinto and Bean models against each other in an attempt to compare validity and create an integrated model. The authors used a three-stage analysis to compare the competing frameworks. First, they tested the validity of the observed variables to determine whether they were appropriate measures of the theoretical elements they purported to indicate. Second, they tested the predictive validity of the two models against each other. Finally, they employed a strategy to examine the convergence of the two constructs across theories using confirmatory factor analysis. The test did not reveal one model to be superior to the other, although Bean's explained more variance. (Cabrera et al., 1992). The integrated model was only marginally better than either of the models on which it was based. Much recent research on the relationship between student

academic and social engagement and student persistence has built on elements of both Bean and Tinto (McClenney and Marti, 2006; Matthews, 2009; Sandler, 2010; Schlinsong, 2010; Pham, 2010; Hu, 2011; Wyatt, 2011; Soria & Stebleton, 2012; Martinez, Bilges, Shabazz, Miller, & Morote, 2012; McClenney, Mart, and Adkins, 2012).

ECONOMIC MODELS OF STUDENT DEPARTURE

Persistence research that includes perspectives on the role of finances draws primarily from two inter-related theories: human capital theory, and student demand theory (St. John et al., 1996; Paulsen, 1998). Human capital theory provides a framework to describe the financial investment students make in college, based on the return they hope to receive. Student demand theory states that the "purchase" of education is subject to many of the same cost effects as products in microeconomic theory: the level of education that students are willing to pursue (and pay for) is negatively associated with its cost. Using these perspectives, St. John and Starkey (1995) unpacked the cost of higher education from one variable (net price) to the different variables that represented several facets of the cost of higher education.

Financial impact theory. Early applications of the financial impact theory found that financial aid, alone, was negatively associated with persistence (St. John & Starkey, 1994; St. John & Starkey, 1995a; Somers, 1995). Researchers interpreted this unintuitive finding as a sign that students receiving financial aid were receiving inadequate levels which thus led to lower rates of retention (St. John & Starkey, 1995a). More importantly, separating the net price variable into variables representing loans, grants, and tuition revealed interactions between different socioeconomic levels and institution type.

Lowest income students were most affected by grant level, while middle-income students were more affect by loans. In a subsequent exploration of this net-price alternative, St. John and Starkey (1995b) found that adult undergraduates were more sensitive to tuition price if they were from disadvantaged backgrounds, or if they attended a public college.

Several institution-specific studies examined the relationship between financial aid and student persistence in the late 1990s. Somers (1995) examined an urban, public university and confirmed earlier findings that financial aid, due to its association with attrition, was inadequate. St. John, Hu, and Tuttle (2000) found similar results at an urban public university, noting that the increase in grants at the institution was crucial in recent increases in retention rate.

Bettinger (2004) examined the effects of Pell Grants on student retention, using panel and cross-sectional variation analysis of Ohio college students. He found significant positive results between Pell Grant level and lower incidence of stop-outs, though cautions that the relationship between Pell Grants and persistence is contingent on the association between Pell Grants and access (Bettinger, 2004). Some students would never enroll without Pell Grants, while some would, but perhaps at a different institution.

Gross, Hossler, and Ziskin (2007) looked at the impact on institutional aid at public four-year institutions and included interaction terms to examine potential interactions between gender and financial aid level. They found statistically significant main effects for institutional gift aid and a statistically significant interaction between aid and gender; the change in predicted probability of persistence per increase in aid was greater for men than for women. However, aid was positively associated with persistence for both genders, and the effect size was small for the entire population.

Two-year institutions. A few studies have focused on student persistence at two-year schools. Although many of these focus specifcally on the community college sector (public non-profits only), the similarities in the populations which consider and attend these schools makes research on these students' success relevant to the current study.

Two-year schools may not devote resources to the type of first-year experiences that fsome four-year colleges do, but use of an analogous success course may help integrate students into the community college campus, especially for nontraditional or disadvantaged students (Stovall, 2000). These at-risk students may respond differently to than students at different level schools. Calcagno, Crosta, Bailey, and Jenkins (2007) found that, contrary to earlier models which suggested older students were less likely to complete, community college students over age 25 were associated with higher probabilities of degree completion. The differences in community college completion rates appear to vary by student background and by method of program delivery. For example, Aragon and Johnson (2008) found that while college readiness and online courseload were significantly related to successfully completion of community college online coursework, ethnicity, age, and financial aid eligibility were not. Mullin (2011) followed a community college cohort for six years and found disadvantaged ethnic groups and college readiness significantly associated with leaving before completion.

Dowd and Coury (2006) used BPS 1990/94 data to examine the effect of loans on community college students, and examined interactions between federal loan level and both dependency status and low income status. They found that loan amount had a negative effect on first-to-second-year persistence for all examined groups except for independent, higher income students. However, when modeled for associate's degree

completion, the effect of loans was not significant. These findings are consistent with a similar study Dowd (2004) conducted on dependent students attending four-year institutions. While the use of subsidized loans was significantly and positively associated with persistence to the second year, this influence did not appear to compensate for differences in degree completion between income levels.

Five years prior, Cofer and Somers (2001) used more recent data, from the NPSAS 1993 and 1996, to examine the impact of financial aid on persistence at public non-profit and for-profit institutions. Their regression analysis showed that tuition had a small negative effect on persistence, while grants and loans had a positive effect. Work-study income was significant in the model for 1996 data, but not 1993. High debt level, which was measured separately from loans, was negatively associated with persistence in 1993, but positively associated in 1996. However, access to financial aid may still be a critical influence on persistence as much as it is on access. McKinney and Novak (2013) found that failure to complete a Free Application for Federal Student Aid (FAFSA) was strongly associated with lower rates of persistence.

Precursors to nexus research. A series of studies using NPSAS:87 explored the financial impact model on within-year persistence for several different student populations. St. John and Andrieu (1995) found that tuition level was related to graduate student persistence regardless of aid level, and that comprehensive packages of loans, grants, and work study were most effective in increasing retention. Hippensteel, St. John, and Starkey (1996), again using national data from NPSAS:87, examined undergraduates at two-year schools and found similar results: Tuition level is negatively associated with

persistence, and, again, a negative association between financial aid and persistence suggests insufficient levels of aid.

Of particular relevance to the proposed study, St. John, Starkey, Paulsen, and Mbadugha (1995) examined the effects of the financial impact model variables on students at proprietary schools. They found, similar to previous examinations of other student populations, that tuition level was negatively and substantially associated with persistence. Also, several new findings suggest that proprietary schools offer a unique educational opportunity for traditionally disadvantaged students: African American and Hispanic students were actually *more* likely to persist at proprietary schools, as were students who did not graduate from high school. These findings suggest that not only do proprietary schools offer opportunities for success to minority students, but that students who attend proprietary schools after earning GEDs are more motivated to complete their degrees.

Following closely on the heels of several studies on price and price subsidies' effects on student persistence in 1995, a 1996 study by St. John, Paulsen, and Starkey expanded the scope further by offering a theory that examined the connection between financial influences, college choice, and persistence.

CONCEPTUAL FRAMEWORK:

NEXUS THEORY OF COLLEGE CHOICE AND PERSISTENCE

St. John et al. (1996) developed a theoretical framework for examining the interaction between college choice and student persistence. They observed that research on these choices drew from similar literature and considered similar variables, despite

seldom being linked in theory or in practice: College choice research informs recruitment practices, while persistence research informs retention efforts. The initial theory framework asserted that these two areas are not only related, but that they are two points in the same decision process—better conceptualized as two points on the same branch rather than two branches of the same tree (St. John et al., 1996). The same issues which influence a student's decision to attend a specific institution will subsequently affect her decision on whether to persist at that institution.

Students choose to attend a college based on prematriculation expectations. Their subsequent decision to persist or leave the college is based on postmatriculation experiences. Nexus theory asserts that student attrition is related to the dissonance between these expectations and experiences. Students' expectations of costs and benefits establish an implicit contract between the students and the institution. Students then evaluate whether that contract has been fulfilled based on *actual* costs and benefits. If students' experiences are consistent with their expectations, they will likely consider the contract "inviolate" and persist. However, "if students' subsequent experiences and perceptions of the benefits and costs of attendance compare unfavorably with their prematriculation expectations, a decision to leave may be more likely" (Paulsen & St. John 1997, p. 67).

The scope of the college choice-persistence nexus theory includes academic, social, and financial expectations and experiences. In their initial presentation of nexus theory, St. John et al. (1996) distinguished between ways that the theory could be empirically tested in these areas: Research into the academic and social nexuses could examine how students' academic or social reasons for choosing a specific college

interacted with their academic and social integration, respectively, in their persistence decisions. Research into the financial nexus could examine how students' financial reasons for choosing a college interacted with market forces like costs and cost subsidies in their persistence decisions. To date, only the financial nexus has been examined in depth.

The initial nexus study (St. John et al., 1996) focused on financial aspects rather than academic or social ones because of the information on finances available in national data sets. The authors noted that national data is ideal for examining market forces, while academic and social integration are better suited for institutional-level study (pp. 186-187). Also, at that time, the national data set best suited for this type of study, the National Postsecondary Student Aid Study (NPSAS), includes variables related to financial market forces, but none related to academic or social integration (St. John et al., 1996). Therefore, it is most feasible to examine the financial nexus, since there is more available data on postmatriculation experiences for a larger population than is the case for the other two domains.

St. John et al. (1996) tested a model based on earlier, financial-impact models of persistence using data from the NPSAS:87. The new model included variables in five categories: (1) student background, (2) indicators of college experience, (3) postsecondary aspirations, (4) finance-related reasons given for college choice, and (5) financial factors (including living expenses) that reflected the actual costs students faced. These last two categories are indicators of financial expectations and financial experiences, respectively. The researchers categorized the financial factors as either "fixed" costs, such as tuition and level of aid, or "controllable," which includes food,

housing, and other living expenses. With data from the NPSAS:87, St. John, Paulsen, and Starkey used a sequential logistic regression to examine these factors as they related to within-year persistence for students enrolled full-time at four-year colleges. They concluded that the financial variables impacting college choice had both direct and indirect effects on persistence decisions, providing evidence of the college choice-persistence nexus (St. John et al., 1996).

A subsequent study (Paulsen & St. John, 1997) expanded on the financial nexus by examining its different effects in public and private non-profit, four-year institutions, again using data from NPSAS:87. The researchers found that students attending public schools were more sensitive to costs, placing higher importance on low tuition and living expenses, while those at private schools placed higher importance on receiving a high level of aid. Also, students attending private schools received more substantial grant aid than those attending public schools, which affected both groups' likelihood of persisting.

Paulsen and St. John (2002) expanded the model further to include social class, represented in the variables by four levels of income: low, low-middle, upper-middle, and upper. Not surprisingly, financial obstacles affected students in lower income groups more significantly than those in higher income groups. However, the most significant financial issue varied by income level: Having an inadequate level of loan or work-study aid most negatively impacted working class students, while the poorest students were more negatively affected by inadequate levels of grant aid (Paulsen & St. John, 2002).

St. John, Paulsen, and Carter (2005) sought to "[complete] the full set of nexus studies on diverse groups of students" (p. 546) by examining the difference in effects between African American students and white students. Researchers found that tuition

and grants more substantially affected African American students' persistence choices, while loans were more effective in improving white students' persistence, suggesting that recent trends of decreasing grant aid to college students and increasing levels of educational loans has negatively affected African American students more than white students (St. John et al., 2005). These four studies comprise the expansion of choice-persistence nexus theory. All four implemented a sequential logistic regression to examine student background and financial variables' effects on within-year persistence, and all four used data from the NPSAS:87. Several dissertations of note have used similar methodology to explore other aspects of the college choice-persistence nexus. Mbadugha (2000) and Hwang (2003) used sequential logistic regression analysis to examine the financial nexus for different student groups.

Mbadugha (2000) examined the financial nexus for community college students, using the NPSAS:87 data and a "refined" version of the model adapted from a then-forthcoming Paulsen and St. John study (2002). Mbadugha reported that community college students were more cost sensitive to tuition than students attending other types of schools, and noted several unique characteristics in particular about students attending community college part-time: Part-time students were much more negatively affected by tuition costs than full-time students. However, African American students were actually more likely to persist when they attended community college part-time than when attending full-time (Mbadugha, 2000). Mbadugha also confirmed earlier studies that demonstrated the nexus between college choice and persistence and showed that community college students follow some of the patterns observed in groups in previous

studies. For example, community college students with GEDs are more likely to persist than those with a high school diploma.

Hwang (2003) examined the financial nexus for full-time, first-time, first-year college freshmen using a model adapted from Paulsen and St. John (2002), including differences among these students based on the type of school they chose (public vs. private; and comprehensive/baccalaureate vs. research/doctoral). This study used NPSAS:96 data, and is the only previous test of the college choice-persistence nexus to use a data set other than NPSAS:87. In addition to observing the general nexus effects, Hwang found that students attending public schools and those attending comprehensive/baccalaureate colleges are more sensitive to grant aid than those attending private or research/doctoral universities, respectively. Hwang also noted that, somewhat paradoxically, an increase in tuition was associated with increased persistence levels for first-time, full-time, first-year students. This trend was suggested to have been a result of students perceiving high cost to signal a higher quality education (Hwang, 2003).

Other dissertations have used the original nexus theory as the basis for conceptual framework to examine related phenomena. Hoezee (2003) examined the involvement between financial aid and the academic nexus between college choice and persistence using the NPSAS, and Bauer (2004) used the nexus theory as a basis to study students' choice to attend community colleges, based on data from the Beginning Postsecondary Students survey. Felts (2008) examined students transferring to a Midwestern public research university using the choice persistence nexus framework and found that fewer success variables had significant effects on transfers from four-year schools than students transferring from community colleges.

A dissertation by Allen (1995), which pre-dates the original nexus study (St. John et al.,1996), used an interactionalist theory of college choice and persistence to examine the relationship between these decisions. Though the timing of the survey was dissimilar to later nexus theory research (the second survey being prior to matriculation) and was a case study of just one institution, Allen may be the first study which explicitly examined the interaction between college choice variables and persistence variables. Recently, literature on institutional policy and planning has embraced the notion that access to higher education and success in higher education are inextricably linked (Bragg & Durham, 2012), and that retention strategies benefit from close coordination with admission policies (Cortes, 2013).

METHODOLOGICAL ISSUES IN PRIOR NEXUS RESEARCH

Prior studies of the choice-persistence nexus have used a sequential (sometimes called hierarchical) regression analysis (St. John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005; Mbadugha, 2000; Hwang, 2003). Researchers compared the relative fit of regression models and the changes in significance that occurred to individual variables after additional variables were "stepped" into the initial model. Though the total number of models varied among these studies, the variable blocks ostensibly were added to the model in the same chronological order that students would encounter them (e.g. college choice variables, then experience variables). While logical, this may not be the most appropriate methodology for studying the financial nexus theory.

Use of sequential regression. Sequential regression analysis is common in education and social science research, but its application must be limited to situations

where warranted by the theory being tested (Petrocelli, 2003). Statistical results may vary depending on the order that variables enter the model, so it is critical that theory dictates the sequence (Frazier, Barron, & Tix, 2004). In short, the use of sequential regression outside of prescription by theory risks misinterpretation of the data. For several reasons, the sequential regression analysis in prior nexus research is not ideal.

For one, in previous studies of the choice-persistence nexus, there is no clear statistical basis for the sequence that variable blocks enter the model. The common methodology in these studies involves adding variable blocks as they would occur chronologically, consistent with the original test of nexus theory (St. John et al., 1996). While chronological order is not uncommon in sequential regression, there is nothing in nexus theory which specifies this order as appropriate. A suspected mediating relationship may warrant regression using a chronological sequence of independent variables. However, there are no such purported relationships in nexus theory. Mediation would require a causal, intervening relationship between, for example, the college choice-related variables and college experience-related variables as they relate to persistence decisions, which is not consistent with the nexus theory framework.

Moreover, the regression steps used in prior nexus studies are not definitively chronological. In some tests of nexus theory, student aspirations enter the model after choice-related variables (St. John et al., 1996; Hwang, 2003) because aspirations were considered measures of commitments made later than college choices. This is not necessarily true. Students' may develop long-term aspirations far earlier which exert influence before the student chooses a college to attend. Also, in all prior nexus studies, variables related to college choice are included before adding actual costs and aid (St.

John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005; Mbadugha, 2000; Hwang, 2003). However, the theoretical evaluation of college costs and benefits, on which persistence decisions are theoretically based, may be either a cumulative process or an event that occurs only after all relevant expectations and experiences are known. Regardless, there may be no particular importance to the specific timing of the financial expectations students form and the costs that they incur.

Application and interpretation of sequential regression. Most importantly, the manner in which sequential regression has been applied in prior studies does not fit the phenomenon that nexus theory describes. The original conceptualization of nexus theory states, "[I]f a particular variable, such as financial aid, increases the likelihood of a matriculation decision, that same variable may influence the likelihood of a persistence decision and/or of how intervening factors influence this decision" (St. John et al., 1996, p. 183). This summary of the choice-persistence nexus theory, which is further elaborated in later nexus research (Paulsen & St. John, 1997; Paulsen & St. John, 2002), describes two suspected relationships: (1) Financial variables related to student choice may directly affect persistence decisions, and (2) financial variables related to student choice may affect the relationship between financial experience variables and persistence decisions. Though not stated explicitly in the literature, the described interaction between choice-related variables and experience-related variables is a *moderating* relationship. According to theory, financial expectations (related to college choice) influence the way that financial experiences relate to persistence decisions. Rather than a strict analysis of costs and benefits, students weigh their experiences against their prior expectations to determine whether their "implicit contract" with the institution has been

violated (St. John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005). Sequential hierarchical regression may be used to examine moderating relationships, but the commonly recommended methodology is different from the variable steps used in prior nexus research (Baron & Kenny, 1986; Frazier et al., 2004; Bennett, 2000).

Sequential regression can be used to examine moderating relationships by regressing a model that includes only the individual independent variables, then adding interaction terms for the appropriate variable combinations in a subsequent model (Frazier et al., 2004; Bennett, 2000). If a moderating relationship is present, the interaction term will be significant, and there will be observable improvement in the model fit. Previous research in nexus theory has not used interaction terms to examine interactions between specific variables. Instead, researchers stepped in variables as blocks that they suspected would interact with variables already in the model. They examined the change in pseudo-R^2 (a measure of model goodness-of-fit used in logistic regression) to determine the relative fit of the models, and they interpreted changes in significance of variables between steps as evidence of interactions. This analysis may not sufficiently address the theoretical financial nexus between college choice and persistence. As Petrocelli (2003) notes, "the focus [of sequential regression] is on the change in predictability associated with predictor variables entered later in the analysis over and above that contributed by predictor variables entered earlier in the analysis" (p. 11). Sequential regression, as it has been used in nexus research, would therefore be appropriate to examine changes in predictability between models containing different variable blocks. However, such an analysis would only speak to the predictability

associated with the later variables themselves, not interactions, which is the focus of the choice-persistence nexus. Also, variables changing significance due to the addition of new variables to the model does not necessarily indicate an interaction.

Costs and aid that students encounter during college are significantly related to student persistence decisions (Somers, 1995; St. John & Starkey, 1995a). As noted above, nexus theory asserts that financial variables related to college choice are also related to persistence decisions and that, additionally, these choice variables moderate the effect that financial experience variables like costs and aid have on those persistence decisions (St. John et al., 1996). A single logistic regression model containing all background, choice, and experience variables is sufficient to examine of whether the financial choice variables are directly related to student persistence, controlling for other factors. An analysis of potential moderating relationships requires adding interaction terms to the model between the appropriate choice and financial experience variables. A comparison of models applied to different strata of institution level (e.g. four-year, two-year) and institution control (e.g. for-profit, public and private non-profit) may provide insight on how the financial nexus phenomenon affects student choices at different institutions. These steps are the basis for the study described in the following chapter.

SUMMARY

Literature on college persistence has primarily focused on social-psychological theories and economic theories, though recent comprehensive theoretical frameworks borrow from both schools of thought. Social-psychological theories focus on students' experiences and characteristics as being factors in decisions to persist or leave, while

economic theories treat the decision as a cost-benefit analysis of the investment of time and money that college costs. More recent examinations of persistence have examined both social-psychological and economic influences in the ways that they affect a student's process of choosing a particular college and then re-evaluating that decision and whether or not to persist. The nexus theory of college choice and persistence describes the student choice, integration, and possible attrition as a process of interrelated student choices.

While there is not yet a great quantity of literature on for-profit colleges, the emergence of proprietary schools on the higher education landscape has led to a number of recent examinations of the students that attend these schools and what factors play a role in their success. Students attending proprietary schools are predominantly nontraditional, and face many similar obstacles that nontraditional students face at nonprofit schools. However, the business model orientation of proprietary schools frequently leads them to be more flexible and sensitive to the needs of their students/customers and, in many cases, willing to devote resources to serving the unique needs of these nontraditional students.

The research questions which guide the current study are based on prematriculation experiences, postmatriculation experiences, their associations with persistence, and their interaction with each other. The financial nexus of college choice and persistence provides a conceptual framework which examines precisely these relationships. Similar studies have used the financial nexus as a basis for examining similar questions about other populations of college students. As the disillusionment that students may report on some proprietary colleges resembles a violation of the "implicit contract" formed at matriculation, it is sensible to ask these questions of student

experiences at for-profit schools, and it is logical to use the financial nexus framework to study this issue as it combines the social-psychological and economic factors that are likely to impact students as they choose whether to attend and whether to persist at these institutions.

CHAPTER 3: METHODOLOGY

The current study modified the approach of previous tests of the financial nexus theory of college choice and persistence (St. John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005; Mbaduagha, 2000; Hwang, 2003). This study applied a financial impact model to students attending for-profit institutions—a population excluded from previous nexus theory research. Given the increasing enrollments at these institutions and the importance of federal policy and regulation applied to them, it is important to explore the financial nexus for the students who choose to attend them. The study included a quantitative analysis of data on students from a national data set. Logistic regression models were used to examine the effects that financial variables, including those related to school choice, have on persistence at these institutions. Three research questions guided this study:

1. Does the impact of finances on college choice have a subsequent effect on students' persistence at for-profit postsecondary institutions?
2. Does the impact of finances on college choice moderate the relationship between financial experiences and students' persistence at for-profit postsecondary institutions?
3. Does the financial nexus of college choice and persistence differ according to institutional control (for-profit/non-profit status)?

DATA SOURCE

The sample for this study was derived from the 2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09) (BPS, 2009). This study collected data from first-time beginning students in 2004, then followed up with surveys in 2006 and again in 2009. The base-year data were collected as part of the 2004 National Postsecondary Student Aid Study (NPSAS:04). The NPSAS, conducted by the National Center for Education Statistics (NCES) at the U.S. Department of Education, provides a nationally-representative survey of postsecondary students. Its primary goal is to "provide reliable national estimates of characteristics related to financial aid" and has been conducted every three to four years since 1987 (NPSAS, 2004, p. 1). The NPSAS:04 included data from student interviews, institutional student records, the National Student Clearinghouse database, and several U.S. Department of Education systems including IPEDS and the National Student Loan Data system (NPSAS, 2004).

Until now, the most recent data used to examine the college choice-persistence nexus was the NPSAS:96 (Hwang, 2003). The current study uses the most recent national data set which is appropriate for the subject matter. The biggest expansion of the for-profit industry has occurred in the last ten to fifteen years, meaning only a study on relatively recent data is likely to provide reliable information on students who attend for-profit institutions. Also, the NPSAS did not include for-profit schools in its survey until 1996. Although the NPSAS:08 would provide more recent student financial data, as well as a somewhat larger sample, it is a poor fit for the current study. Specifically, because the 2008 NPSAS did not focus on first-time beginning students, the student survey did not provide information about financial reasons for college choice that are needed to

examine the financial nexus of college choice and persistence. Thus, BPS:04/09 was the most appropriate choice for this study.

The initial BPS:04 cohort was created from students within the NPSAS:04 sample that met the criteria of first-time beginners (FTBs). The BPS:04/09 includes all NPSAS:04 data on this subsample as well as student survey responses to questions on their reasons for various financial decisions. In addition to the substantial financial and student background information collected by NPSAS, the BPS provides information on students' educational choices, persistence, and degree attainment (BPS, 2009). This research study primarily used data gathered from students during the base year in 2004, with the exception being 2009 variables which report students' cumulative persistence and attainment.

NATIONAL POSTSECONDARY STUDENT AID STUDY

The NPSAS:04 sampled more than 101,000 eligible undergraduate students from 1,670 eligible institutions in the U.S. and Puerto Rico, including almost all institutions eligible to receive federal Title IV funding. These included public and private institutions classified into 22 national strata. Since 1996, private, for-profit schools have been included under this definition due to their receiving Title IV funds (Ruch, 2001). Expanding the study to include these institutions also expanded the number of postsecondary students that fell into the target population. The data collection process occurred in two stages: (1) sampling eligible institutions, and (2) sampling eligible students within those institutions (NPSA, 2004).

Institutional sampling. The sample of eligible institutions was derived from IPEDS data from 2000-01 through 2002-03. The population universe for the NPSAS:04

was restricted to institutions in the 50 U.S. states, the District of Columbia, and Puerto Rico. Institutional eligibility was based on Title IV funding eligibility. An institution's instructional programming must be aimed to students who have graduated from high school, must be at least 300 clock hours or three months, and must not be restricted to members of a particular corporation or union (BPS, 2009). Institutions failing to meet these criteria were removed from the sample. Also, because of their unique function and funding, U.S. service academies were excluded.

Data for the remaining eligible institutions were cleaned to address missing data and very large or small enrollment sizes, as these could create inappropriate sample selection probabilities. Of the 1,630 eligible institutions, 1,360 (83.5%) provided student enrollment lists (BPS, 2009).

Student sampling. The student universe for the NPSAS:04 included all students attending eligible institutions that were enrolled in an academic program, credit course that could be applied toward a degree, or other vocational training between July 2003 and June 2004, provided that the student was not concurrently enrolled in a high school or program geared toward high school completion or equivalency, such as a GED. Of the 109,210 selected students, 97,090 were undergraduates. Of these undergraduates, 49,410 were "potential" first-time beginners (FTBs); these included students who enrolled in an eligible program for the first time after high school during the 2003-04 academic year, as well as those who may have enrolled previously, but never completed a course or credit (BPS, 2009). The 49,410 total first-time beginning undergraduates selected as eligible for the NPSAS:04 sample included 8,280 attending private, for-profit less-than-two-year institutions and 4,540 attending private, for-profit two-year-or-more institutions.

The NPSAS:04 applied multiple types of sampling to undergraduates; first-time beginners (FTBs) were sampled separately from undergraduates who were not first-time beginners (BPS, 2009). FTBs were oversampled in order to establish a sufficient sample for the BPS planned follow-ups. Also, selected states were oversampled in order to examine state-level effect subsamples. Different strata of students used different sampling rates for individual institutions, with the goal of approximating probabilities of student-level selection. These rates may have been modified in order to ensure at least 10 students would be sampled from a particular institution, and to ensure that institutions were not overly burdened in the event that the initial sample would have yielded 50 or more students beyond the number initially expected. The stratified, two-stage design of the sampling process requires special consideration of variance inflation, as most software packages assume simple random samples (see weighted analysis consideration below).

The NPSAS:04 collected data from five sources. These provided a breadth of information about both students and their institutions, and the considerable overlap in data permitted confirmation of accuracy of much of the information gathered (NPSAS, 2004).

Computer Assisted Data Entry system. The student record abstraction, collected via computer-assisted data entry (CADE), included financial and registration information from institutions. Web-based student interviews collected student responses to selected items.

Student interviews. NPSAS researchers collected data from students using web-based surveys. Some were self-administered by the student, while others were administered by NPSAS interviewers.

Central Processing System. The Central Processing System (CPS), the U.S. Department of Education's database of student federal financial aid records, provided information from student-completed Free Application for Federal Student Aid (FAFSA) forms.

National Student Loan Data System. The National Student Loan Data System (NSLDS), the U.S. Department of Education's database of federal Title IV funding information, provided information on Pell Grant awards and Title IV loans.

Integrated Postsecondary Education System. The Integrated Postsecondary Education System (IPEDS), run by the National Center for Education Statistics (NCES), provided information on sampled students' postsecondary institutions attended.

SUBSAMPLE OF BPS:04/09 FOR THE CURRENT STUDY

The sample for this study came from the set of first-time beginning undergraduate students identified in the BPS:04/09 base-year data set collected within the NPSAS:04. The initial NPSAS sample of eligible institutions included 270 private, for-profit colleges; the initial sample of eligible students attending these institutions was 13,820 (NPSAS, 2004). These undergraduate students were the primary focus of the study sample, though data from first-time beginning students attending non-profit schools were collected for comparison. Data were examined, cleaned, and examined for missingness, and then observations missing necessary variables were removed via listwise deletion.

The resulting set (total n = 13,248) was separated into for-profit and non-profit subsamples based on the NPSAS variable FCONTROL.

Stratification by institution level. Prior research has shown that students at less-than-two-year for-profit institutions (LT2-FP), students at two-year for-profit institutions (2YR-FP), and students at four-year for-profit institutions (4YR-FP) come from statistically distinct populations (Chung, 2004). To examine each of these populations, and in order to enable comparison to similar non-profit institutions, student data were stratified by institution level using the NPSAS variable FLEVEL, which combines information from the student interview and 2003 IPEDS data to categorize students' first institution attended in 2003-04 as less-than-two-year, two-year, or four-year. This stratification was conducted on both for-profit and non-profit subsamples.

There are several notable discrepancies in the distribution of institutions by level and by sector. First, less-than-two-year institutions outside of the for-profit sector are rare. Stratification by institution level resulted in only four observations corresponding to "less-than-two-year, non-profit institutions." This stratum was omitted from the study, since it is not possible to conduct meaningful comparative analysis between for-profit and non-profit schools at that level. Comparisons between the for-profit and non-profit sectors only occurred at the two-year and four-year level, where available observations permitted. Also, almost all observations of students attending non-profit schools at the two-year level were in public schools (99.82%). Therefore, the comparison of two-year institutions by sector is effectively a comparison of two-year for-profit (2YR-FP) and two-year public non-profit schools (2YR-NP-PUB).

The four-year non-profit (4YR-NP) sample is comprised of both public (66.26%) and private (33.74%) institutions. Since the focus of this study is the for-profit sector and the ways that for profit institutions differ from non-profit schools in general, the non-profit sample was not split into separate subsamples (i.e. public and private) for the initial analysis. A single dichotomous variable in models for the 4YR-NP sample represents whether these observations occurred at public or private institutions. Although the term "non-profit institutions" is used throughout the methodology and findings of the current study, this is not meant to imply that there are no substantive differences between these schools, nor to suggest that "non-profit" is considered a single sector. This language serves only to distinguish students at the institutions of interest, for-profit schools, from all others.

STATISTICAL MODEL

The model for this study was adapted from models used in prior tests of the financial nexus theory of college choice and persistence (St. John et al. 2005). The dependent variable is cumulative persistence and attainment at the student's first institution attended. The independent variables fall into one of four categories: (1) student background, (2) college choice, (3) college experience, and (4) finances. All variables were coded as categorical variables except for age, integration indexes, and the financial variables, which are continuous. Table 3.1 lists the variables in the model and the source from which each was taken.

Table 3.1

List of Model Variables by Definition and Source

Variable	Operational Definition	Source
Student Background Variables		
Gender	Gender as reported by student	SI, CADE
Race	Race as identified by student	SI, CADE
Age	Age in years	CPS, SI
Marital Status	Whether student is single, married, separated, or divorced	CPS, SI
High School Status	Whether student earned high school diploma, GED, or neither	SI, CADE
Mother's Education	Highest level of education achieved by student's mother	SI, CPS
Income as percentage of Poverty Level	Ratio of family income to poverty level (based on family size)	CPS (derived)
Student's Dependency Status	Whether the student's tax status is independent or dependent for the 2003-04 school year	CPS
Educational Aspirations	The highest level of education that the student ever expects to achieve	SI

Variable	Operational Definition	Source
College Experience Variables		
Degree Program*	Type of program entered (e.g. Bachelor's degree, Associate's degree)	SI
Institution control**	Public or private institution	IPEDS, SI
Enrollment/Course Load	Whether the student was enrolled part-time or full-time during the 03-04 school year	SI
Employment	The number of hours worked at a job per week during the 03-04 academic year	SI
Grades	Student's cumulative GPA for the 03-04 academic year	CADE, SI
Academic integration*	BPS-provided composite measure of activities related to academic integration	SI
Social integration*	BPS-provided composite measure of activities related to social integration	SI
Financial Experience Variables		
Grant Amount	Total amount of all grants and scholarships received during the 03-04 academic year	CADE
Loan Amount	Total amount of all loans received during the 03-04 academic year	CADE

Variable	Operational Definition	Source
Tuition Level	Total tuition and fees paid for the 03-04 academic year	CADE
Non-Tuition Expense	Student's total non-tuition expenses (attendance adjusted) in the student budget at the NPSAS institution for the 03-04 academic year	CADE
College Choice Variable		
Impact of Finances on College Choice	Whether or not students reported cost, affordability, or other financial concerns as reasons for their choice of institution	SI
Dependent Variable		
Cumulative Attainment/Persistence at first institution attended	Still enrolled or completed program by the 2008-09 academic year	SI

SI = student interview; CADE= Computer-Assisted Data Entry system; IPEDS = Integrated Postsecondary Education System (Two sources listed indicate primary, secondary source of data)

*not included in models for LT2YR sample
**only included in models for non-profit schools

CRITERION VARIABLE

The dependent variable for this study was cumulative persistence at first institution attended: Of those students surveyed in 2003-04, those who either completed their program or who remained enrolled as of 2008-09 are considered persisters. Students who left their first institution prior to completing their degree are considered to

have left, regardless of whether they transferred to another institution or dropped out. The NPSAS variable PROUTF6 recorded students' cumulative retention and attainment at the first institution they attended as of the 2008-09 academic year. Whereas PROUTF6 has seven possible responses, these were dichotomized: If students attained their certificate, attained an associate's degree, attained their bachelor's degree, or had not completed their degree but were still enrolled, they were considered persisters. Students who left the institution without a degree or transferred prior to earning a degree were considered to have left.

STUDENT BACKGROUND VARIABLES

Many student background variables may influence persistence decisions and must be controlled for in the model. Those included in the model for this study were gender, age, ethnicity, mother's education level, family income as a percent of the poverty level, marital status, student dependency status, high school credential, and long-term aspirations. Previous research has examined all of these variables in relation to persistence.

Gender. There is conflicting research over whether gender is a significant variable in predicting persistence, with Pascarella et al. (1983) finding men less likely to persist. The NPSAS variable GENDER, as reported by the student during the interview, is recoded so that 0 = female and 1 = male.

Age. Studies have found age to be significantly related to persistence decisions (Bean & Metzner, 1985). Student age as of 12/31/2003, as reported on their FAFSA application and coded directly as the NPSAS variable AGE, is included as a continuous

variable and was grand mean centered for ease of interpretation of the resulting regression coefficient.

Ethnicity. Tinto (1982) found that ethnicity is significant in predicting persistence, with different minority groups being less likely to persist. During the student interview, students were asked, "What is your race?" The eight census categories of race into which these responses were coded—white, black/African American, Hispanic/Latino, Asian, American Indian/Alaska native, Native Hawaiian/Pacific Islander, more than one race, or "other"—are recoded from the NPSAS variable RACE into four dummy variables: black, Hispanic, Asian and other. White students serve as the reference group.

Mother's education level. Parental education is represented in the model by mother's education level, which has been shown to be a more significant predictor of persistence than either father's education level or any measure combining the two (St. John et al., 1991). The student interview responses to the question "What is the highest level of education your mother completed?" were coded into ten categories for the variable PMOMED. These ten have been re-coded into six: (1) did not complete high school, (2) high school completion, (3) some college but no degree, (4) associate's degree, (5) bachelor's degree, (6) graduate or other post-bachelor degree. Students whose mothers completed only high school served as the reference group; the other five were coded as dummy variables.

Family size and income level. Paulsen and St. John (2002) found significant relationships between family income levels and persistence after recoding income to four categories—low, lower-middle, upper-middle, and upper income levels. Also, low-

income students are less likely to persist through school if they have dependents than if they have none (Corrigan, 2003). As a way to represent family socioeconomic status, this study used a variable that represents income adjusted for family size. The BPS variable PCTPOV reported students' 2003-04 family income as a percentage of the federal poverty level for 2002. The original variable was continuous and ranged from zero to 1,000, with 100 representing the poverty level (100%). All students with incomes greater than ten times the poverty level were recoded as 1,000. Based on its frequency distribution, this variable has been converted to quintiles representing the low (0 to 100), lower-middle (101 to 200), middle (201 to 300), upper-middle (301 to 400), and upper (over 400) ratio levels. The "middle" category served as the reference group. Though based on 2003-04 family information, this variable serves as a proxy for students' socioeconomic status during their education.

Marital status. Prior studies have found significant relationships suggesting that students' marital status may affect their evaluation of the costs and benefits of attending college (St. John et al., 2005). The NPSAS survey included the question, "What is your current marital status?" The resulting variable SMARITAL included three categories. Two of these categories, "single, divorced, or widowed," and "separated," were combined to serve as the reference group. The response of "married" was coded as a single dichotomous variable. For the study model, married = 1 and not married = 0.

Student's dependency status. Students' dependency status (whether students are financially independent or dependent) has been found in some cases to have a significant relationship with persistence for lower income groups (Paulsen & St. John, 2002). For the study model, a control variable was included based on the NPSAS variable DEPEND,

which is based on FAFSA information. The variable was recoded so that dependent students = 0 and independent students = 1.

High school credential. Prior research showed that students that earned GEDs are more likely to persist at for-profit schools than students with high school diplomas (St. John et al., 1995). The NPSAS variable HSDEG records whether a student earned a high school diploma, a GED, or no high school diploma, based on the responses from the student interview question, "Which of the following best describes your high school completion?" Students with high school diplomas were coded 0; those that reported they had not (most earning a GED) were coded 1.

Long-term educational aspirations. Students' stated goals for postsecondary education (i.e. the highest degree they sought to achieve) have been significantly associated with persistence in past studies. However, whereas earlier studies show a positive relationship between persistence and higher aspirations (St. John, 1991), more recent studies have found that shorter-term goals to be more positively associated with persistence (Paulsen and St. John, 1997). The NPSAS interview asked students, "What is the highest level of education you ever expect to complete?" The question was originally coded into eight responses (HIGHLVEX). For this study, the four highest levels were combined into "graduate/post-bachelors," which is dummy coded along with "associate's degree," "certificate." The response "bachelor's degree" was the reference group. Those students reporting "no degree or certificate" for this question were excluded from the study.

College Experience Variables

Several variables related to students' college experience were included in the model, including those related to attendance intensity, job workload, and academic and social integration.

Enrollment intensity. Persistence decisions may differ for part-time students and full-time students. Because students may vary their attendance intensity over the course of (potentially) six years, this study examined students' attendance intensity during their first year, 2003-04, as a proxy of their attendance pattern for the duration of their attendance. The NPSAS variable ENRSTAT showed students' attendance intensity pattern in 2003-04, based on monthly attendance patterns as reported in the BPS 04/06 student interview. Although students responses were coded "mostly full-time," "mostly part-time," or "both equally," these last two have been combined into one category. Students who attended full-time most of the year were coded as 1; those attending part-time for half to most of the year were coded 0.

Employment while in school. Student employment while in school has been found to be significantly related to persistence in previous nexus research (Hwang, 2003). Since students attending for-profit schools are frequently non-traditional and may work while attending school, inclusion of this variable in the model is necessary as a control. Student work patterns may vary over the course of their postsecondary education. Similar to attendance pattern, this study uses students' reported employment intensity for their first year (2003-04) as a proxy for employment intensity for the duration of their education. The NPSAS:04 student interview asked students the question, "How many hours, on average, do you work per week during the 03-04 school year?" Where

applicable, students were asked to exclude assistantship or workstudy hours. The total number of hours is reported in the variable JOBENR. Students reporting that they worked 35 hours or more per week were considered full-time; students who reported they worked fewer than 35 hours per week were considered part-time. For the current study, both of these categories were dummy coded. Students reporting they worked no job served as the reference group.

Degree program differences between sectors and levels. Preliminary examination of the data revealed differences between institution sector, level, and type of degree pursued. Degree program varied within the for-profit institution-level strata in a manner different from that of the non-profit strata. The distribution of degree programs did not correlate with the most commonly associated institution level (i.e. certificates at less-than-two-year institutions, associate's degrees at two-year institutions, and bachelor's degrees at four-year institutions). In the non-profit samples, students attending two-year schools almost exclusively pursued associate's degrees (99.82%), and most students attending four-year schools pursued bachelor's degrees (97.63%). However, this distribution did not hold true for the for-profit samples. Nearly half of students attending 4YR-FP schools are in associate's degree programs (49.66%) while most of the rest (49.12%) reported pursuing bachelor's degrees at these institutions. Just under one-third of students attending two-year for-profit schools reported pursuing certificates (28.33%).

Due to the variability of degree program within some institutions, it was necessary to represent degree program in some models to control for the impact that program duration has on persistence. Dummy variables corresponding to degree program

were included in the for-profit models but not the non-profit models, as there is not sufficient variability to warrant such a variable in the latter.

Degree program variables for this study were based on the BPS variable "UGDEG." Ostensibly, UGDEG adjusted student survey responses to be consistent with the degrees offered at the institution they attend (BPS, 2009). For example, if a student enrolled at a two-year institution which offered no bachelor's degrees responded to a survey question that they were pursuing a bachelor's degree, the variable UGDEG would show this student as being in a two-year (associate's) degree program. Given that the scope of this study is restricted to persistence at first institution, UGDEG was the most appropriate BPS variable to use to represent degree program since it describes students' programs respective to the institution in which they were enrolled during 2003-04. However, the NCES Powerstats codebook for BPS methodology states, "There were numerous questions in the 2004 student interview about the respondent's degree plans, degree expectations, reasons for enrolling, and transfer plans. The responses are not necessarily consistent" (2009, p. 573). In light of this disclaimer, several unusual observations in the data must be noted.

Despite the above explanation of the variable UGDEG, the for-profit sector data contains a very small number of observations that suggest inconsistency between program and institution level. Although associate's degrees offered at four-year schools and certificates offered at two-year schools are common in the for-profit sector, there are other more striking differences. For example, 1.22% of students in the 4YR-FP sample (5.89 observations, weighted) were enrolled in a certificate program, which is traditionally a less-than-two-year degree. Additionally, there were a few students

enrolled in programs longer than what the institution level, by definition, would traditionally offer. There are a small number of students pursuing associate's degrees at less than two-year schools (0.58%), bachelor's degrees at two-year schools (0.92%), and even some bachelor's degrees at less-than-two-year schools (0.98%).

These observations, though unusual, did not warrant concern. For one, none of the sample strata contained more than a handful of similar cases. Also, these odd situations were limited to the for-profit sector. The data suggest for-profit institutions may offer a wider range of degree program lengths than non-profit schools; this practice may complicate some institutions' classification level by traditional standards. Although models for the for-profit samples do not include dummy categories for these less common situations due to their rarity, variable coding for the major degree programs took them into consideration. Reference groups were designated so that any outliers would be included in the most-adjacent category.

For example, the dummy variable for degree program at 4YR-FP institutions designated students pursuing bachelor's degrees; therefore the few students pursuing certificates would be included in the reference group of students in less-than-four-year degree programs at those institutions (mostly associate's degrees). A similar strategy was used in models for the two-year institutions: The dummy variable designates students enrolled in certificate programs to ensure that any outlying bachelor's degree program observations were included in the reference group along with students pursuing associate's degrees. The less-than-two-year for-profit sample does not include variable coding for degree program since there is not sufficient variability to differentiate between categories (98.44% pursuing certificates).

Grades. Student grades in college are a strong predictor of student persistence (Pascarella & Terenzini, 1991). This model includes the NPSAS variable GPA, based on institutional records, which reports students' college grade point average for the 2003-04 academic year, standardized to a 4.0 scale and then multiplied by 100.

Social and academic integration. The BPS:04/09 dataset includes composite variables for academic and social integration. The academic integration index (ACAINX04) is based on student responses to four survey items about their interactions with faculty, academic advisors, and peer study groups during 2003-04. The social integration index is based on student responses to three survey items about their participation in intramural sports, fine arts activities, or other student clubs during 2003-04. These index variables were grand mean centered and included in all models for two-year and four-year institutions. The academic and social integration survey questions were not asked of students at less-than-two-year institutions. Therefore, the integration indexes were not available for inclusion in those models.

Students' living situation (i.e. on-campus, off-campus with parents, off-campus not with parents) was not included in the model. This information is largely redundant to other variables like the social integration index, as well as dependency status. Also, since few for-profit schools offer on-campus housing, there is little variance on this variable among students at for-profit schools.

FINANCIAL VARIABLES

Unlike most variables in the model, which were coded dichotomously, financial variables are coded as continuous variables in $1,000 units. However, because these variables are used to create interaction terms to examine potential moderating

relationships, it is necessary to center them in order to avoid multicollinearity. Using a method recommended by Frazier et al. (2004), these continuous variables are centered by subtracting the sample variable mean so that the mean of the new standardized variable is zero. This avoids potential interpretation problems in the model, as otherwise continuous predictors may be highly correlated with the interaction terms necessary for testing for moderation.

Tuition level. The NPSAS variable TUITION2 reports the total amount of all tuition and fees, adjusted for attendance, paid during the 2003-04 academic year, based on institutional records. This variable, centered, then divided by 1,000, is included in each model.

Non-tuition expenses. The NPSAS variable BUDNONAJ reports students' total non-tuition expenses, adjusted for attendance, paid during the 2003-04 academic year, based on institutional records. This includes the typical sum of books, supplies, room and board, transportation and personal expenses. This variable centered, then divided by 1,000, is included in each model.

Grant amount. The NPSAS variable TOTGRT reports the total amount of all grants and scholarships received during the 2003-04academic year, based on institutional records. This variable centered, then divided by 1,000, is included in each model.

Loan amount. The NPSAS variable TOTLOAN2 reports the total amount of all loans received during the 2003-04 academic year (including parents PLUS loans) based on institutional records. This variable centered, then divided by 1,000, is included in each model.

College Choice Variable

Financial variables relating to college choice refer to students' perceptions of finances which influence their decision to attend a particular institution. Both fixed and controllable costs have been found to be significantly related to persistence decisions in prior studies (St. John et al., 2005).

The NPSAS:04 interview included the question, "Why did you decide to attend [NPSAS institution]?" Students had the option of selecting "cost (affordability or other financial reasons)" among other possible options. Whether students identified cost as an influence on their school choice was reported by the dichotomous NPSAS variable RAD04C (0 = cost/finances did not affect school choice; 1 = cost/finances did affect school choice). This variable was adopted into the financial impact model as "financial impact on college choice" (FICC) to examine its role in predicting persistence to attainment.

Moderating Relationships

Four interaction terms are used in additional models to examine whether moderating effects occur between financial influence on college choice and actual finances. These terms paired the variable for financial impact on college choice, FICC, with the dollar amounts reported for tuition, non-tuition expenses, loans, and grants, respectively.

Table 3.2

List of Variables and Coding Levels

Variable	Categories	Coding
Criterion		
Cumulative Persistence	Persisted (completed or still enrolled)	0 = no; 1 = yes
Student Background Covariates		
Age	Age in years as of 12/31/03	Continuous and grand mean centered
Gender	Male	0 = no; 1 = yes
Race	Black	0 = no; 1 = yes
	Hispanic	0 = no; 1 = yes
	Asian	0 = no; 1 = yes
	White	Reference
	Other	0 = no; 1 = yes
Mother's Education	No High School Credential	0 = no; 1 = yes
	High School	Reference
	Some College, No Degree	0 = no; 1 = yes
	Associate's Degree	0 = no; 1 = yes
	Bachelor's Degree	0 = no; 1 = yes
	Graduate/post-bachelor's Degree	0 = no; 1 = yes
High School Credential	High School Diploma	Reference
	GED	0 = no; 1 = yes
Dependency	Independent Student	0 = no; 1 = yes
Income/poverty level ratio	Lower	0 = no; 1 = yes
	Lower middle	0 = no; 1 = yes
	Middle	reference
	Upper middle	0 = no; 1 = yes

Variable	Categories	Coding
	Upper	0 = no; 1 = yes
Marital Status	Married	0 = no; 1 = yes
Degree Aspirations	Certificate	0 = no; 1 = yes
	Associate's Degree	0 = no; 1 = yes
	Bachelor's Degree	reference
	Graduate/Post-Bachelor's	0 = no; 1 = yes
College Experience		
Enrollment/Course Load	Enrolled Full-Time	0 = no; 1 = yes
Employment	Worked full-time	0 = no; 1 = yes
	Worked part-time	0 = no; 1 = yes
	No job	Reference
Grades	Cumulative GPA	4-point scale x 100, centered
Academic Integration* Index	Composite BPS variable	Continuous, grand mean centered
Social Integration Index*	Composite BPS variable	Continuous, grand mean centered
Institution Type**	Private non-profit institution	0 = no; 1 = yes
	Public non-profit institution	Reference group
Degree Program***	Certificate***	0 = no; 1 = yes
	Bachelor's degree***	0 = no; 1 = yes
Financial Variables		
Tuition	Units of $1,000	Continuous, centered
Non-Tuition Expense	Units of $1,000	Continuous, centered
Loans	Units of $1,000	Continuous, centered
Grants s	Units of $1,000	Continuous, centered
College Choice		

Variable	Categories	Coding
Financial Impact on College Choice (FICC)	Financial issues affected college choice	0 = no; 1 = yes
Nexus Interaction Variables		
Tuition x FICC	Interaction of choice and finance variables	
Non-Tuition Expenses x FICC	Interaction of choice and finance variables	
Loans x FICC	Interaction of choice and finance variables	
Grants x FICC	Interaction of choice and finance variables	

*Not applicable to less-than-two-year institutions.
**Only applies to non-profit samples.
***Only applies to 2YR-FP and 4YR-FP models.

STATISTICAL ANALYSIS

Statistical models with dichotomous outcome variables, like the one for this study, violate the basic assumptions of an ordinary least squares (OLS) analysis (Peng, Lee, & Ingersoll, 2002). Linear regression is therefore inappropriate. Of the few statistical techniques applicable to models such as this one, logistic regression is the most common (Cabrera, 1994), though probit and linear regression have been applied to college student retention research (Dey & Astin, 1993). Logistic regression has become widely used in higher education for explanatory and predictive studies for binary outcomes such as persistence (Peng, So, Stage, & St. John, 2002) and it is the technique utilized in prior inquiries of the choice-persistence nexus (St. John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005), though its application in this study is modified from prior nexus research. Unlike prior studies, this study does not

"step" blocks of variables into the model, except for the addition of interaction terms. Prior studies have not used interaction terms.

DATA MANAGEMENT

The publicly available data files did not provide sufficient level of variable detail to conduct the statistical analysis necessary for this study. Therefore, the study used the restricted use data file for the BPS 2004/09 study. The data files were kept in a secure office and stored in a locked file cabinet when not in use. The electronic files and all generated data and analysis files were stored on a password-protected desktop computer which was not connected to any network or the internet. The computer was secured with a warning regarding the sensitivity of the data, and only the researcher and dissertation methodology faculty member had access to the data.

Several data management steps occurred prior to analysis. First, a study sample data set using only the necessary identification, methodological, and substantive variables of interest was created from the original BPS dataset. Second, non-responses were examined to determine whether they could be reasonably re-coded into legitimate response categories. Third, the data were restricted to the population of students at for-profit and non-profit schools for whom data were available on all model variables (listwise deletion). Fourth, data were examined to determine whether missing data and refusals occurred randomly. Where systematic refusals or missingness occurred, appropriate statements acknowledging the potential for bias are included in the interpretation.

The current study used a subsample of 13,248 students for whom no variables of interest were missing. The study sample was divided into for-profit and non-profit

sectors, then stratified by institution level. This yielded subsamples of students attending less-than-two-year for-profit institutions (LT2YR-FP; *n* = 946), two-year for-profit institutions (2YR-FP; *n* = 441), four-year for-profit institutions (4YR-FP; *n* = 338), two-year non-profit institutions (2YR-NP; *n* = 4,194), and four-year non-profit institutions (4YR-NP; *n* = 7,315). There were not a sufficient number of students attending less-than-two-year non-profit institutions to include this stratum (*n* = 4). Omitting these observations, as well as any student who reported they were not pursuing any credential or never expected to receive any credential, yielded an initial sample of *n* = 17,429. Of these, 4,181 were missing at least one variable of interest and were removed via listwise deletion. All analyses were conducted using SAS v9.2. Initially, weighted univariate analyses were conducted to examine data distribution. Although logistic regression does not make the same assumptions as OLS regression, it is necessary to examine the data to verify a few assumptions. First, independence is assumed due to the design of the NPSAS:04 and BPS:04/09 studies. Second, the data were examined for multicollinearity using comparison of correlation coefficients of variables of interest. All further multivariate analyses were conducted using PROC SURVEYLOGISTIC, which accounts for the complex survey design and sampling weights, and generates variance estimates for the models (SAS, 2010). The BPS analysis strata variable ANALSTR and analysis cluster variable ANALPSU were used in all models. Each sample used normalized weight variables based on the BPS weight variable WTB000.

Logistic Regression

Logistic regression makes two basic assumptions (Cabrera, 1994). In terms of the items of interest for this study, those assumptions may be described as follows: One, the

probability of each possible value of the dependent variable (to persist or not) varies as a function of selected regressors (e.g. background variables, college choice variables) for each student. Two, a logistic function describes the relationship between the set of regressors and the binary dependent variable. The odds of a student persisting can be expressed as

$$\frac{\pi}{1-\pi}$$

where π is the probability of persistence ($Y = 1$) when persisting is coded as "1" and leaving is coded "0." This expression can be transformed using the logit function, which is the inverse of the logarithm. The natural logarithm of the odds, called "log odds," is equivalent to the logit of the probability (Peng, Lee, & Ingersoll, 2002). The basic logistic model, using a single regressor variable X and binary dependent variable Y, can be expressed:

$$logit(Y) = ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta X$$

where α denotes a constant and β is the regression coefficient (Peng et al., 2002). The above equation may be rearranged to express the probability of the outcome of interest, 1 (persisting):

$$\pi_i = Probabilty(Y_i = 1 \mid X_i = x_i) = \frac{e^{\alpha + \beta X}}{1 + e^{\alpha + \beta X}},\ i = 1,\ldots k$$

where "e" is Euler's (natural) number (Peng, Lee & Ingersoll, 2002; Hwang, 2003). The logit therefore has a linear relationship with the regressor variable X, even though this variable is not linearly related to the probability π. Estimation of the parameters of the

linear logit expression occur through the *maximum likelihood* (ML) method, which is not unlike the OLS method. However, Cabrera (1994) distinguishes between the two:

> While OLS is concerned with choosing those parameter estimates that would minimize the sum of squared errors between the observed and predicted *Y*s, ML estimation seeks to choose those estimates that would yield the highest probability…of having obtained the observed probability *Y*. (p. 229)

LOGISTIC REGRESSION MODELS

For the initial analysis, five logistic regression models were applied to each of the five sector-level subsamples: The base model (no interactions), tuition nexus, non-tuition expense nexus, loan nexus, and grant nexus were each modeled for LT2YR-FP institutions, 2YR-FP institutions, 4YR-FP institutions, 2YR-NP institutions, and 4YR-NP institutions. Coding convention for the models includes a sector designation, a number indicating the interactions included in the model, and a letter indicating the institution level. The prefix "FP" precedes models for for-profit samples, while "NP" precedes models for non-profit samples. The number "1" indicates that the model contained no interaction terms, while the numbers "2," "3," "4," and "5" designated the model as containing the nexus interaction variable (FICC x financial variable) for tuition, non-tuition expenses, loans, and grants, respectively. The letter "A" designates that the model was applied to the less-than-two-year institution sample (for-profit only), "B" the two-year samples, and "C" the four-year samples. For example, the tuition nexus model for 4YR-FP schools is coded FP2C. Table 3.3 summarizes each model by showing which variables differentiate it from other study models.

Table 3.3

Summary of Estimated Models

Model	For-Profit (FP)	Non-Profit (NP)
All models	age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment, college gpa, grants, loans, tuition, non-tuition expenses, financial impact on college choice (FICC)	
Model 1A: Base model (no interactions) Less-than-two-year	No additional variables	*n/a*
Model 1B: Base model (no interactions) Two-year	Degree program (associate's/certificate)	No additional variables
Model 1C Base model (no interactions) Four-year	Degree program (bachelor's/associate's)	Public/private status
Model 2A: Tuition nexus Less-than-two-year	Grants*FICC	*n/a*

Model	For-Profit (FP)	Non-Profit (NP)
Model 2B: Tuition nexus Two-year	Degree program (associate's/certificate), tuition*FICC	Tuition*FICC
Model 2C Tuition nexus Four-year	Degree program (bachelor's/associate's), tuition*FICC	Public/private status, tuition*FICC
Model 3A: Non-tuition expense nexus Less-than-two-year	Non-tuition expenses*FICC	*n/a*
Model 3B: Non-tuition expense nexus Two-year	Degree program (associate's/certificate), non-tuition expenses*FICC	Non-tuition expenses*FICC
Model 3C Non-tuition expense nexus Four-year	Degree program (bachelor's/associate's), non-tuition expenses*FICC	Public/private status, non-tuition expense*FICC
Model 4A: Loans nexus Less-than-two-year	Loans*FICC	*n/a*

Model	For-Profit (FP)	Non-Profit (NP)
Model 4B: Loans nexus Two-year	Degree program (associate's/certificate), loans*FICC	Loans*FICC
Model 4C Loans nexus Four-year	Degree program (bachelor's/associate's), loans*FICC	Public/private status, loans*FICC
Model 5A: Grants nexus Less-than-two-year	Grants*FICC	*n/a*
Model 5B: Grants nexus Two-year	Degree program (associate's/certificate), grants *FICC	Grants*FICC
Model 5C Grants nexus Four-year	Degree program (bachelor's/associate's), grants *FICC	Public/private status, grants *FICC

The (logit) function $g(\hat{y})$, where $\hat{y}$ is the probability of persistence, has a linear relationship with the dependent variables, which can be expressed for the base model equation as:

$$G(Y) = \beta_0 + \beta_1 age + \beta_2 male + \beta_3 ethnicity_{Afr\_Am} + \beta_4 ethnicity_{Hisp}$$
$$+ \beta_5 ethnicity_{Asian} + \beta_6 ethnicity_{other} + \beta_7 mother_{no\_highschool}$$
$$+ \beta_8 mother_{some\_college} + \beta_9 mother_{assoc\_degree}$$
$$+ \beta_{10} mother_{bach\_degree} + \beta_{11} mother_{grad\_degree}$$
$$+ \beta_{12} ratio\_income\_pov_{low} + \beta_{13} ratio\_income\_pov_{low-mid}$$
$$+ \beta_{14} ratio\_income\_pov_{high-mid} + \beta_{15} ratio\_income\_pov_{high}$$
$$+ \beta_{16} independent + \beta_{17} married + \beta_{18} nodiploma$$
$$+ \beta_{19} aspirations_{cert} + \beta_{20} aspirations_{assoc}$$
$$+ \beta_{21} aspirations_{grad} + \beta_{22} enrollment_{full-time}$$
$$+ \beta_{23} employment_{full-time} + \beta_{24} employment_{part-time}$$
$$+ \beta_{25} gpa + \beta_{26} academic\_integration$$
$$+ \beta_{27} social\_integration$$
$$+ \beta_{28} institution\_type_{private\_nonprofit} + \beta_{29} degree\_program$$
$$+ \beta_{30} FICC + \beta_{31} tuition + \beta_{32} nontuition + \beta_{33} loans$$
$$+ \beta_{34} grants$$

Additionally, interaction terms for FICC and the four financial variables (e.g. $\beta_{35} FICC * tuition$) apply to the respective interaction models for each sector and institution level sample. Academic and social integration are not included in the less-than-two-year institution models because the BPS study did not collect data for those items from those schools. Institution type, referring to public vs. private institutions, is omitted from all for-profit sample models. Degree program is included only in 2YR-FP and 4YR-FP models to account for variation in program length.

Examination of the independent variable FICC across for-profit models was used to answer the first research question, "Does the impact of finances on college choice have a subsequent effect on students' persistence at for-profit postsecondary institutions?" Answering the second research question, "Does the impact of finances on college choice moderate the relationship between financial experiences and students' persistence at for-profit postsecondary institutions?" required an analysis of the interaction variables in models 2, 3, 4, and 5, as well as a comparison of goodness-of-fit statistics between each of those models and model 1. Where there was observed a significant interaction term and significant change in -2LL, this was interpreted as evidence of a moderating effect. Where there was a significant interaction term but no significant change in -2LL, this was interpreted as evidence of a weak moderating effect. Where a model showed no significant interaction terms, this was interpreted as no evidence of a moderating effect.

To answer the third research question, "Does the financial nexus of college choice and persistence differ according to institution control (for-profit/non-profit)?" two steps were necessary. First, the models from the first two research questions were re-estimated and examined for non-profit schools. Then, where results suggested similar nexus interactions at both non-profit and for-profit schools at the same level, additional models were created to examine whether these relationships differed by sector (i.e. three-way interactions).

Three-way interactions. Further statistical analysis of the difference between nexus interactions across institutional sectors was conducted on nexus models that displayed significant interaction terms (at least weak moderating effects) in both the for-profit and non-profit models in the initial analyses. Two models met this criteria: grants

at two-year schools, and tuition at four-year schools. Examination of potential differences between the for-profit and non-profit financial nexus was conducted using logistic regression analysis on combined populations of all students attending for-profit or non-profit institutions at each appropriate level. That is, a tuition nexus model was regressed on the combined sample populations of students attending 4YR-FP or 4YR-NP institutions. Likewise, a grant nexus model was regressed on the combined sample populations of students attending 2YR-FP or 2YR-NP schools. Appropriate degree program and sector dummy variables, similar to the ones from the prior analyses, were included. This combined logistic regression analysis was intended to highlight potential sector differences by examining potential interactions between the institution sector and the nexus—an ostensible 3-way interaction between the financial choice variable (FICC), the financial variable (tuition or grants), and the institution sector variables.

This combined-sector analysis occurred in two steps: First, a model regressed all control, institution sector, choice, and financial variables in addition to three necessary two-way interactions: (1) FICC with the appropriate financial variable (the nexus interaction), (2) FICC with the appropriate sector variables, and (3) the financial variable with the sector variable. Second, an additional regression model was run, adding the three-way interaction term between FICC, tuition, and sector. The regression results were then analyzed to examine whether the three-way interaction was significant and whether the model including the three-way interaction term was a better fit for the data than the model lacking this term. For the four-year tuition interaction models, this process was performed for both the public and private non-profit sector variables in order to contrast the for-profit schools with each.

Analysis of Logistic Regression Coefficients and Evaluation of Models

Consistent with recommendations by Peng and So (2002), four aspects of the logistic regression analyses were examined: (1) the likelihood ratio, Wald test, and -2 log likelihood, which provide an overall evaluation of the model relative to an intercept-only model; (2) the significance, based on Wald χ^2 test, of relevant terms, including interactions between the financial choice variable (FICC) and each of four variables representing components of the cost of attending their first institution; (3) changes in -2LL between the base model ("1") and interaction models, indicating better relative fit; and (4) the Somer's *D* metric given by SAS, which is a measure of association based on whether predicted probabilities are consistent with actual outcomes.

Testing of Models. The likelihood ratio, score, and Wald test provide information on whether the model in question is a significant improvement over a null (intercept-only) model. Keeping with previous nexus research, this study also utilized a similar indicator of the maximum likelihood function, the -2 log likelihood (-2LL), reported for each model in the sequential steps. Smaller values of the -2 log likelihood indicate a better fitting model.

Tests of Individual Regressor Variables. Wald's χ^2 statistic is the standard measure of significance for the independent variables in a logistic regression model (Peng, Lee, & Ingersoll, 2002). Individual variables of interest were tested for significance at the $p < .05$ level. Interaction terms were tested for significance at the $p < .1$ level.

Using a method described by Cabrera (1994) and utilized in nexus research (Paulsen & St. John, 2002), it is possible to calculate a predicted change in probability in

terms of percentage points based on unit changes in the value of specific predictor variables, delta-*P*. The baseline *P*, denoted P_0, is the mean probability of the outcome of interest for the model. The coefficients of variables in the logistic regression analysis can be converted to a "change in probability" statistic, delta-*P*, relative to P_0. In the case of a financial variable like tuition, which is coded in $1,000 increments, the delta-*P* is the decrease in probability of persistence given a one unit ($1,000) increase in tuition (Mbadugha, 2000). For the dichotomous independent variables, such as gender (male = 0; female = 1), the delta-p is the difference in predicted probability of persistence that a female student has over a male student. As noted by Cabrera (1994), there is no method for assessing the statistical significance of delta-*P*s, so the estimated values are only meaningful in a particular model for variables of interest that were found to be significant.

Goodness-of-Fit. The standard measure of goodness-of-fit for an ordinary least squares (OLS) analysis is R^2, which represents the proportion of variance in the dependent variable of a model that can be explained by the set of predictors There is no equivalent measure of variance in logistic regression (Cabrera, 1994; Menard, 2000). There are several versions of a comparable "pseudo" R^2s that measure relative goodness-of-fit of several models. However, these pseudo-R^2 measures do not represent any measure of variance in the dependent variable (Peng, So, Stage, & St. John, 2002) nor any measure of efficiency in the model's predictions (Peng, Lee, & Ingersoll, 2002). These pseudo-R^2s do not occur on the same scale as a standard OLS R^2, and cannot be interpreted as such.

Due to these limitations, comparisons of goodness-of-fit for this studied relied on the -2LL measure, as changes in this measure can be tested using a χ^2 significance test. This makes it possible to use the difference in -2LL to determine whether one model is a significantly better fit than another. The model comparisons examined the improvement in model fit after the addition of an interaction term. Keeping consistent with the significance level used to examine the significance of the parameter estimates, the change in -2LL was examined for significance at the .1 level.

Validation of Predicted Probabilities. The extent to which the model's predictions are consistent with observed outcomes (i.e. where high percentages are associated with the outcome of interest occurring and low percentages are associated with its non-occurrence) is expressed as a measure of association (Peng, Lee, and Ingersoll, 2002). The measure most common to higher education and nexus research is Somer's *D*, which is often mischaracterized as a measure of goodness-of-fit (Peng, So, Stage, & St. John, 2002). Somer's *D* reports the percentage of fewer errors in predictions made by the model than by chance alone. Higher values for Somer's *D* indicate fewer errors and a more accurate prediction model.

LIMITATIONS AND DELIMITATIONS

Several issues should be noted as limitations and delimitations to this study. First, as has been noted in previous studies using NPSAS-collected data, the scope of persistence decisions is limited (St. John et al., 1996; Paulsen & St. John, 1997; Paulsen & St. John, 2002; St. John et al., 2005). For example, this study examines only first-time beginners. Findings, then, may not be generalized to other students who return to school

after stopping out. Also, since many for-profit institutions have rolling enrollment policies to allow students to begin at any term, it is possible that the selected time frame, based on traditional academic years, does not fully capture the dynamics of for-profit students' persistence decisions.

Second, it should be noted that the study excludes all students who attended more than one institution within the 2003-04 academic year. BPS data does not include base-year tuition information on students who attended multiple institutions within the base year. This is primarily due to complications that arise when students transfer to schools from which NPSAS:04 did not collect data (NPSAS, 2004). Because tuition level is an essential variable for examining nexus theory, these cases are excluded from the current study. Though missing these students is not ideal, preliminary investigation of the data suggests that the number of students who fall into this category is small.

This study also did not take into account students' initial intent with regards to transfers. The theoretical nexus of college choice and persistence operates under the implicit assumption that students intend to complete a degree at the college where they first enroll. This assumption is not always correct. Exceptions would most likely occur when students enroll at a two-year institution with the intent of transferring to a four-year institution after two years—a practice that would not necessarily require completion of an associate's degree along the way. Since the scope of this study is limited to persistence to attainment at the first institution attended, a student who followed this path would be classified as having left without a degree since she did not finish a credential at the two-year school. Although the BPS student survey asked whether students planned to transfer to a four-year institution, the base-year student survey occurred after most students had

begun classes for the 2003-04 academic year. The coded responses do not provide enough information to determine whether students made transfer plans after arriving on campus, or whether transferring was their intent from the beginning. This distinction is crucial, as it relates to students' post-matriculation evaluation of their implicit contract with the institution. The responses to this survey question are therefore of no benefit to the current study. However, the findings of a recent six-year longitudinal study suggest that only a small proportion of students enroll in two-year schools with no intention of completing a credential there.

Less than 10% of students who begin at two-year institutions leave without a credential and go on to complete a degree at a four-year institution within six years (Shapiro, Dundar, Chen, Ziskin, Park, Torres, & Chiang, 2012). Granted, this does not account for students who plan to transfer out all along and proceed to do so, but then fail to complete a degree at their second institution. Also, student transfer patterns alone do not provide information on why and when students made their decisions to transfer. However, based on the small number of students that this issue appears to affect, this limitation is not a significant problem to the current study.

On a related issue, the current study does not distinguish whether persisters completed the degree they initially pursued. A student who enrolls in a bachelor's degree program but leaves the institution after two years with an associate's degree is considered to have persisted to attainment, despite having left "early." Such decisions may be of interest for future research. These situations are not considered to have a significant impact on the findings of this study.

In addition, the current study was limited in its ability to examine financial aspects of college choice and persistence due to the manner in which BPS survey questions were changed for the 2004 student survey. The BPS variable used for financial impact on college choice (FICC) provided less information in the BPS: 04/09 than in prior year studies which served as the basis for studies of the choice-persistence nexus. The NPSAS:04 interview asked students whether financial issues influenced their college choice. However, unlike previous NPSAS surveys, the NPSAS:04 survey did not ask students about the individual importance of different components of net price. That is, students were not asked to specify whether cost, aid, or other expenses *individually* affected their school choice, as was asked in prior years. It was therefore not possible to examine whether perceptions of fixed costs, such as tuition and financial aid packages, influence persistence differently from perceptions of other costs, such as living expenses, over which students have some degree of control. Thus the variable FICC is somewhat limited in its ability to capture the financial expectations which may contribute to the formation of the theoretical implicit contract. Likewise, the dependent variable captures whether students ultimately but does not identify the specific reasons why non-persisters left the program. Though later BPS:09 follow-ups included such questions, there were too few respondents to these questions for the information to be used in this study.

Finally, the age of the data limits the study somewhat. Most variables used in this study were recorded in the base year. There has been significant growth in the for-profit sector over the last decade, so conclusions drawn on 2004 data may not be applicable students attending these institutions in 2013. Most notably, the number of students participating in online and distance education has increased significantly, and BPS data

includes only a small proportion of students who took classes via these routes. This is perhaps the biggest single limitation to the findings of the current study. However, the BPS:04/09 is the most recent nationally-representative data that contains the variables necessary to conduct this type of study.

The NPSAS:08, in contrast, did not ask questions related to institutional choice, which are essential for examining the choice-persistence nexus. This may be due to the fact that the NPSAS:08 served as base year for the Baccalaureate and Beyond (B&B:08) longitudinal study, in contrast to the NPSAS:04, which served as the base year for the BPS:04/09. The goals of the associated longitudinal studies appears to dictate what questions are included. Many questions in NPSAS:08 related to students plans after graduation, while the NPSAS:04 had more questions related to student choice. Future iterations of the BPS:04/09 may provide appropriate data for further nexus research. Thus, despite its age, the data for the BPS:04/09 is the most appropriate for the current study. Data were collected in the midst of rapid growth in the number of students attending for-profit institutions, so the information it provides is still valuable.

SUMMARY

The analysis of this study consisted of logistic regression of data obtained from the BPS:04/09 survey. Logistic regression models—a base model containing no interaction terms, and four models using nexus interaction terms for financial variables of interest—were applied to samples of students attending non-profit and for-profit schools at the four-year and two-year level, as well as students attending for-profit schools at the less-than-two-year level.

Statistical analysis included a -2 log likelihood to test goodness-of-fit, and observation of a Wald's χ^2 and delta-*P* coefficients to test individual regressor variables. Also, a Somer's D enabled validation of the specific predicted probabilities of the models.

CHAPTER 4: FINDINGS

The initial sample for this study was drawn from first-time beginning college students who were interviewed during the base year of the Beginning Postsecondary Student Survey (as part of the 2004 National Postsecondary Student Aid Study) and with whom researchers were able to follow up in 2009. This study derived a sample of students from the full BPS 2004/2009 population for whom data were available on all necessary methodological variables. The BPS:04/09 study sample of n = 18,644 observations included 2,620 students attending for-profit institutions at all levels. Of these, 15,160 were successfully interviewed in 2009, including 1,860 students who attended for-profit institutions. Due to the size of the for-profit student population in the study sample, and due to the fact that the analysis required stratification by institution level, it was determined that dividing the sample into exploratory and holdout subsamples, which was the original intent, was not possible, as splintering the for-profit sample to such a degree would compromise power.

MISSINGNESS OF DATA

Missing data from the original sample for this study (n = 17,429) ranged from zero to thirty variables per observation (M = 1.89, SD = 4.14). More than three-quarters (75.95 percent) of observations had no missing variables, and 88.86 percent were missing five or fewer. Pearson Correlation tests were conducted to assess correlations between

missingness among variables and to assess correlations between variable missingness and other variables' observations.

Coefficients for missingness among variables yielded expected results, with dummy coded variables showing perfect correlations. However, missingness among background variables such as race, mother's education, employment, marital status, and dependency showed high correlations. This is likely due to the fact that background information was collected via the student interview; missingness appears to indicate that the entire student interview portion was missing for many students. Also, there were unexpectedly high correlations between missingness between financial aid variables (grants and loans) and student background variables. Tuition and non-tuition expenses did not show this same level of correlated missingness. This may be a reflection of the composition of the sample. For example, socioeconomic status and associated background variables may be correlated with shorter programs which did not warrant aid. Regardless, the data does not appear to be missing at random, so caution must be exercised when interpreting the findings of this study. There were no strong correlations between variable missingness and observed values in other study variables. In addition to unsurprising correlations between missing categories of aspirations and associated program lengths, only dependency showed correlations greater than 0.2 with missingness among variables. All of these correlations were less than 0.3.

UNIVARIATE ANALYSES

Normalized weighted descriptive statistics were examined to determine differences in subsample populations. Table A.1 (Appendix A) shows the full descriptive statistics for for-profit institutions, stratified by institution level. For the for-profit

sample, the rate of persistence to attainment at first institution was 53.25 percent at the less-than-two-year level, 38.17 percent at the two-year level, and 31.33 percent at four-year schools.

Descriptive Statistics of For-Profit Sample. In terms of basic demographics, the sample populations at all three for-profit institution levels were more female than male. The samples were 76.86 percent female, 52.17 percent female, and 59.00 percent female at the LT2YR-FP, 2YR-FP, and 4YR-FP samples, respectively. Mean age was comparable across all three levels: 24.93 (*SD* = 8.46) for the LT2YR-FP sample, 24.00 (*SD* = 7.70) for the 2YR-FP sample, and 24.34 (*SD* = 8.61) for the 4YR-FP sample. Racial distribution in the LT2YR-FP sample was evenly distributed primarily between black (30.09 percent), Hispanic (33.79 percent), and white (30.50 percent) students. However, the 2YR-FP and 4YR-FP samples were predominantly white. White students made up 51.39 percent and 44.48 percent of students at 2YR-FP and 4YR-FP schools, respectively. Black students comprised 22.63 percent and 21.75 percent of the 2YR-FP and 4YR-FP samples, respectively. Hispanic students comprised 19.96 percent of the 2YR-FP sample and 21.66 percent of the 4YR-FP sample.

Family education and aspirations. Educational background and aspirations varied between institution level samples. Mother's education level for students attending LT2YR-FP institutions was predominantly a high school diploma (44.19 percent) or less (31.12 percent). For the 2YR-FP sample, these figures were 51.02 percent for high school diploma and 18.19 percent for less, while mother's education level for the 4YR-FP sample was 43.51 percent high school diploma only and 14.29 percent less. Students attending 4YR-FP schools were more likely to have a high school diploma (84.61

percent)—as opposed to a GED or other credential—than students attending 2YR-FP (75.85 percent) or LT2YR-FP institution (69.77 percent). Student aspirations varied noticeably by institution level, with 51.70 percent of students at 4YR-FP schools aspiring to eventually earn graduate degrees and 38.49 percent aspiring to earn bachelor's degrees. For students attending 2YR-FP institutions, aspirations ranged from 14.49 percent expecting to earn certificates, 23.15 percent expecting to earn associate's degrees, 36.04 percent expecting to earn bachelor's degrees, and 26.32 percent expecting to earn bachelor's degrees. Whereas 30.59 percent of the LT2YR-FP sample aspired to earn certificates and 13.26 percent aspired to earn associate's degrees, 32.98 percent of these students reported they expected to earn bachelor's degrees and 23.17 percent expected to one day earn graduate degrees.

Dependency and marital status. The proportion of dependent students was greater in the 4YR-FP sample than the other levels of for-profit schools. More than half of students (51.64 percent) at 4YR-FPschools were dependent, compared to 42.81 percent of students in the 2YR-FP sample and 37.37 percent of students in the LT2YR-FP sample. Unmarried students comprised similar proportions of all three for-profit samples: 86.73 percent of the 4YR-FP sample, 86.17 of the 2YR-FP sample, and 83.93 percent of the LT2YR-FP sample.

Ratio of income to poverty level. Students were divided into five categories based on the ratio of their income to the poverty level, which is based on family size. The lowest category, which included students whose family income was at or below the poverty level, represented more than one-quarter of the 4YR-FP sample (30.39 percent), more than one-third of the 2YR-FP sample (40.08 percent), and more than half of the

LT2YR-FP (52.12 percent). The proportion of students in the highest (greater than 400 percent of the poverty level) and second highest (above 300 percent to 400 percent of the poverty level) categories comprised smaller proportions of the LT2YR-FP sample (both at 2.31 percent) than the 2YR-FP sample (8.60 percent and 6.30 percent, respectively) or the 4YR-FP sample (9.65 percent and 9.86 percent, respectively).

Attendance and employment intensity. Full-time status was more common in the two-year for-profit sample (90.39 percent) than in either the 4YR-FP sample (80.40 percent) or the LT2YR-FP sample (87.96 percent). A comparable proportion of students in each study subsample worked part-time: 32.54 percent of students at LT2YR-FP institutions, 36.77 percent of students at 2YR-FP institutions, and 33.43 percent of students at 4YR-FP institutions. However, the proportion of students that either worked full-time or did not work varied greatly. Within the 4YR-FP sample, 44.25 percent of students worked full-time while 22.32 percent did not work. In the LT2YR-FP sample, nearly the reverse was true: 23.39 percent worked full-time while 44.07 percent did not work. In the 2YR-FP sample, these groups were comparable: 31.46 percent worked full-time, while 31.77 percent did not work.

Financial impact on college choice. For students in the LT2YR-FP sample, 34.25 percent gave an affirmative response to the "financial impact on college choice" (FICC) survey questions, compared to 32.17 percent of students at 2YR-FP schools and 26.55 percent of students at 4YR-FP schools. By comparison, 69.52 percent of students at 2YR-NP schools and 54.11 percent at 4YR-NP schools responded that cost or other financial reasons affected their college choice.

Financial variables related to net cost. Financial variables were not substantially different between the 2YR-FP and 4YR-FP subsamples. The mean tuition and fees charged for 2003-04 was $9,103.26 (*SD* = 4959.32) for the 4YR-FP sample and $8,854.45 (*SD* = 4730.95) for the 2YR-FP, whereas the mean loan level was $6517.03 (*SD* = 5445.92) for the 2YR-FP and $7,119.16 (*SD* = 6280.68) for the 4YR-FP sample. For these two measures, the mean for the LT2YR-FP sample was lower: $7,820.34 (*SD* = 3250.03) for tuition and $3,868.90 (*SD* = 3560.40) for loans. However, mean grants awarded and mean non-tuition expenses were comparable for all three samples. The mean grant level was $3,059.90 (*SD* = 1970.51) for the LT2YR-FP sample, $2,926.89 (*SD* = 3112.13) for the 2YR-FP sample, and $3,203.73 (*SD* = 3428.20) for the 4YR-FP sample. The mean non-tuition expenses level was $7,395.29 (*SD* = 2881.05) for the LT2YR-FP sample, $7,340.41 (*SD* = 3419.26) for the 2YR-FP sample, and $7,858.09 (*SD* = 3664.93) for the 4YR-FP sample.

Comparisons of for-profit and non-profit two-year samples. The 2YR-NP was similar to the 2YR-FP sample on several basic variables. The mean age of the 2YR-NP was similar (*M* = 22.91; *SD* = 8.30) to 2YR-FP (*M* = 24.00; *SD* = 7.70), the mean academic integration index of 55.78 *SD* = 41.96) was comparable to the 2YR-FP sample mean of 55.46 (*SD* = 47.38), and the mean social integration index of 17.00 (*SD* = 32.89) was somewhat higher than the 2YR-FP sample mean of 10.72 (*SD* = 26.44). However, there are several differences between the sector samples at the two-year institution level. Full comparisons of the descriptive statistics of the 2YR-FP, 2YR-NP, 4YR-FP, and 4YR-NP samples appear in table A.2 (Appendix A).

The 2YR-NP sample had a smaller proportion of male students (42.78 percent) and a larger proportion of white students (60.84 percent) than 2YR-FP (47.83 percent and 51.39 percent, respectively). Also, the proportion of mothers' education level at the associate's and bachelor's degree levels was higher (14.81 percent and 11.86 percent, respectively) for 2YR-NP. The family income to poverty level ratio of students in the 2YR-NP sample was much more evenly distributed across quintiles than in the 2YR-FP sample. For example, 21.99 percent of the 2YR-NP sample represented the highest ratio level (greater than 400 percent of poverty level). The proportion of single students in the 2YR-NP sample (84.94 percent) was comparable to that of the 2YR-FP sample. However, much larger proportions of the 2YR-FP sample were dependents (65.89 percent) and had earned a high school diploma (86.73 percent). The proportion of the 2YR-NP sample expecting to earn a graduate degree someday (44.87 percent) was much larger than the 2YR-FP sample, while the proportion of students expecting an associate's degree to be the highest they ever earned (15.84 percent) was much lower.

Similar to the 2YR-FP sample, a similar proportion of students in the 2YR-NP sample either worked full-time (29.63 percent) or did not have a job (24.16 percent). However, a larger proportion worked part-time (46.21 percent) than in the 2YR-FP sample. The proportion of the 2YR-NP sample attending school full-time (52.89 percent) was substantially less than the 90.39 percent at the 2YR-FP sample.

The proportion of students in the 2YR-NP sample who reported that finances impacted their college choice (FICC) was more than double the proportion of the 2YR-FP sample who reported the same—69.52 percent compared to 32.17 percent. The mean for tuition (M = \$1,372.86; SE = 1505.75), loans (M = \$353.68; SE = 1260.11), grants (M =

$1,151.46; *SE* = 1892.16), and non-tuition expenses (*M* = $5,428.88; *SE* = 2713.06) for the 2YR-NP sample were all lower than the means for the 2YR-FP sample.

The persistence-to-completion rate for the 2YR-FP sample (38.17 percent) was higher than at 2YR-NP schools (30.96 percent). However, comparisons of raw completion rates between non-profit and for-profit schools may not be comparable due to a larger proportion in the latter group pursuing shorter degree programs.

Comparisons of for-profit and non-profit four-year samples. There were pronounced differences between the non-profit and for-profit samples of four-year schools on numerous variables. The 4YR-NP sample had a lower mean student age (*M* = 19.16; *SD* = 4.09), and higher mean indexes of academic integration (*M* = 88.15; *SD* = 41.68) and social integration (*M* = 63.99 percent; *SD* = 52.47). The proportion of male students (44.59 percent) in the 4YR-NP sample was comparable to the 4YR-FP sample.

The proportion of black students (9.47 percent) and the proportion of Hispanic students (9.50 percent) in 4YR-NP sample were each less than half of the proportions of those populations in the 4YR-FP sample. White students comprised 70.28 percent of students in the 4YR-NP sample. In term of family income-to-poverty ratio, 41.07 percent of the 4YR-NP sample belonged to the highest quintile (greater than 400 percent). Independent students comprised 6.76 percent of the 4YR-NP sample; married students comprised 2.44 percent. Both proportions are considerably less than those found in the 4YR-FP sample.

More than one-quarter of the 4YR-NP sample reported mother's education level as bachelor's degree (26.78 percent), and 15.84 percent had a graduate or professional degree—both higher than the 4YR-FP sample. Just 4.86 percent of the 4YR-NP sample

reported mother's education level as less than a high school diploma. Most of the 4YR-NP sample had earned a high school diploma as opposed to a different credential (95.64 percent), and 0.66 percent reported aspirations below the level of bachelor's degree. Aspirations in the 4YR-NP sample were nearly one-quarter bachelor's degree (23.84 percent) and three-quarters graduate or professional degree (75.50 percent).

Compared to the proportion of the 4YR-FP sample which chose their institution at least in part based on cost (26.55 percent), more than half of the 4YR-NP sample (54.11 percent) responded affirmatively that their college choice was impacted by finances (FICC). The proportion of persisters in the 4YR-NP sample (63.04 percent) is double that of the 4YR-FP sample (31.33 percent).

Mean tuition in the 4YR-NP sample (M = \$9,414.80; SE = 8289.25) is comparable to that of the 4YR-FP sample. Mean grants (M = \$4,878.16; SE = 5947.76) and non-tuition expenses (M = \$8,960.85; SE = 2678.22) are somewhat higher for the 4YR-NP sample than the 4YR-FP sample, but the average loan level (M = \$3,105.52; SE = 5009.18) is less than half of the average in the 4YR-FP sample.

BIVARIATE ANALYSIS

Logistic regression does not follow the same assumptions that must be in place for ordinary least squares regression (Cabrera, 1992). Data does not have to follow assumptions of linearity, normality, heteroskedasticity. However, bivariate correlations were examined for multicollinearity. Bivariate correlations between independent variables were also examined. Excluding expected correlations between categorical dummy variables such as race, Pearson correlation coefficients ranged from 0.00016 to 0.71 (absolute values). Only 14 correlations were greater than 0.3, and only one of these,

GPA, was correlated with the dependent variable (0.31). Multicollinearity does not appear to be a significant issue.

A rotated factor analysis was conducted in order to assess the variation among variables included in the model. The principal factors was used as the initial method followed by a varimax rotation. The analysis revealed five factors with Eigenvalues greater than one. The rotated factor pattern results showed only one variable loaded at greater than 0.4 on more than one factor (student dependency loaded at -0.42 on one factor and -0.68 on another). The base model appears appropriately specified.

LOGISTIC REGRESSION ANALYSIS

These regression results address the three research questions at the center of this study. Question one, regarding the theoretical relationship between financial choice and persistence, was answered by examining the significance of the financial choice variable across all for-profit models. Question two, regarding the theoretical financial nexus between college choice and persistence, was answered by examining the significance of the interaction terms, the degree to which the interaction models provide a better fit for the data than the base (no interaction) model at each institution level, and comparison of which models at which levels best predicted actual outcomes. Variable significance was examined at the .05-level for all variables except interaction terms, which were examined for significance at the 0.1 level.

Question three, regarding the contrast in financial nexus between for-profit and non-profit schools, was answered in two steps: First, logistic regression models were applied to non-profit samples similar to the models used to answer question two. The

results of these analyses were used to compare interaction term significance, model fit, and measures of association between sectors. Second, for each interaction term that was significant for both for-profit and non-profit samples, an additional logistic regression model was applied to a combined sample of all observations of for-profit and non-profit students at that particular institution level. The combined-sector base model containing all relevant two-way interactions between financial choice, the designated financial variable, and a new variable designating institution control (for-profit or not for-profit) was then compared to a final model which added a three-way interaction term between all three. The results of this final analysis were then examined for interaction term significance and any model improvement (fit or predictive ability) over the preceding combined-sector model.

RESEARCH QUESTION ONE

Does the impact of finances on college choice have a subsequent effect on students' persistence at for-profit postsecondary institutions?

Research question one was addressed by examining the significance of a specific term in the logistic regression model: "Financial impact on college choice" (FICC) was a binary variable based on students' affirmative or negative response to the BPS survey question which asked whether cost, affordability, or other financial reasons affected their choice of institution. FICC was included in the model for cumulative persistence and attainment at first institution attended in each for-profit model (1 through 5) across all strata (LT2YR-FP, 2YR-FP, and 4YR-FP). A significant relationship between FICC and student persistence at the .05 level would have provided evidence of a relationship

between the impact of finances on college choice having a subsequent effect on students' persistence at for-profit institutions.

The results of the analysis showed no significant relationship between the variable FICC and persistence in any model for any of the for-profit institution strata. FICC was not significant in the base models for LT2YR-FP, 2YR-FP, or 4YR-FP institutions. Additionally, of the 12 logistic regression models on the student populations attending for-profit institutions, none showed a statistically significant relationship ($p < .05$) between FICC and persistence. There is no evidence of a direct relationship between financial impact on college choice and subsequent persistence at for-profit institutions at any level.

Tables 4.1, 4.2, and 4.3 show the *p*-values of key variables and relevant measures of model fit for each for-profit institution level.

Table 4.1

Logistic Regression Results for Less-than-two-year For-profit Institutions

Model	Base Model		Tuition Nexus		Nontuition Nexus		Loan Nexus		Grant Nexus	
	p		*p*		*p*		*p*		*p*	
Intercept	0.7565		0.7528		0.7512		0.8633		0.7515	
FICC	0.8069		0.8061		0.8100		0.8291		0.8059	
Tuition	0.7818		0.8791		0.7604		0.8554		0.7768	
Nontuition	0.0006	**	0.0006	**	0.0075	**	0.0010	**	0.0006	**
Loans	0.7846		0.7779		0.8252		0.0842		0.7951	
Grants	0.8701		0.8681		0.9093		0.9065		0.8244	
FICC*Tuition			0.8665							
FICC*Nontuition					0.4835					
FICC*Loans							0.0004	**		
FICC*Grants									0.9079	

-2LL	1117.267	1117.217	1116.029	1104.498	1117.238
Δ -2LL	-	0.050	1.238	12.769 **	0.029
(*1307.428*)***					
Somer's *D*	0.281	0.282	0.282	0.285	0.281

*$p < .05$; **p < .01;
***intercept only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Table 4.2

Logistic Regression Results for Two-year For-profit Institutions

Model	Base Model	Tuition Nexus	Nontuition Nexus	Loan Nexus	Grant Nexus
	p	*p*	*p*	*p*	*p*
Intercept	0.0013 **	0.0006 **	0.0013 **	0.0012 **	0.0010
FICC	0.0873	0.1242	0.0881	0.1169	0.0949
Tuition	0.2088	0.0002 **	0.1645	0.1490	0.3196
Nontuition	0.3937	0.2512	0.2682	0.3838	0.3050
Loans	0.1278	0.1462	0.1282	0.0563	0.1313
Grants	0.8820	0.9540	0.8317	0.8827	0.3814
FICC*Tuition		0.0329 *			
FICC*Nontuition			0.4211		
FICC*Loans				0.0466 *	
FICC*Grants					0.0505 †
-2LL	452.423	445.853	451.905	448.916	450.216
Δ -2LL		6.570 *	0.518	3.507 †	2.207
(*586.428*)***					
Somer's *D*	0.513	0.521	0.512	0.510	0.515

†(interactions only) p < .1; *$p < .05$; **p < .01; ***intercept-only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Table 4.3

Logistic Regression Results for Four-year, For-profit Institutions

Model	Base Model	Tuition Nexus		Nontuition Nexus		Loan Nexus		Grant Nexus	
	p	*p*		*p*		*p*		*p*	
Intercept	0.8604	0.8634		0.8257		0.8583		0.7265	
FICC	0.5445	0.6396		0.5454		0.5484		0.4415	
Tuition	0.0588	0.0171	*	0.0604		0.065		0.0347	*
Nontuition	0.0117	0.0174	*	0.0252	*	0.0128	*	0.0073	**
Loans	0.6936	0.7675		0.7308		0.7689		0.6956	
Grants	0.6606	0.4881		0.6838		0.6605		0.1622	
FICC*Tuition		0.0474	*						
FICC*Nontuition				0.6731					
FICC*Loans						0.8641			
FICC*Grants								0.1056	
-2LL	308.618	305.900		308.552		308.599		305.091	
Δ -2LL (*420.280*)***		2.718	†	0.066		0.019		3.527	†
Somer's *D*	0.565	0.567		0.565		0.565		0.563	

†(interactions only) p < .1; *p < .05; **p < .01; ***intercept-only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

RESEARCH QUESTION TWO

Does the impact of finances on college choice moderate the relationship between financial experiences and students' persistence at for-profit postsecondary institutions?

Research question two was addressed by examining a series of measures to test for moderating relationships among variables (Frazier et al., 2004; Bennett, 2000). A

base model including all background and control variables, FICC, and financial measures was applied to each for-profit institution-level strata. For each strata, the base model was compared to four additional models that differed from the base only by the inclusion of a single interaction term between FICC and one of the four financial variables representing components of net price: tuition, non-tuition expenses, loans, and grants, respectively. Determining the presence of a moderating relationship between FICC and the impact of finances on persistence was based on two pieces of data: (1) the statistical significance of the interaction term, and (2) observable improvement in the model fit as a result of the inclusion of the interaction term. The statistical significance of the interaction term was based on the Wald χ^2 test ($p < .1$). The observable improvement in the model was based on observation of significant decrease in the -2LL. Full results of the logistic regression analysis on for-profit institutions appear in Tables A.3, A.4, and A.5 (Appendix A).

Significance of interaction terms. Of the 12 nexus interactions examined in the for-profit models, five were statistically significant ($p < .1$). For LT2YR-FP institutions (see table 4.1), the loan nexus model showed a significant interaction ($p = .0004$). For 2YR-FP institutions (see table 4.2), the tuition nexus model ($p = .0329$), the loan nexus model ($p = .0466$), and the grant nexus model ($p = .0505$) showed significant interactions. For 4YR-FP institutions (see table 4.3), the tuition nexus model ($p = .0474$) showed significant interactions. These significant interactions suggest that the relationship between students' financial experiences and their subsequent persistence to attainment varies depending on the role of finances in students' choices to attend for-profit colleges.

Relative Goodness-of-Fit. The goodness-of-fit of the interaction models relative to the base model were based on the change in -2LL upon inclusion of interaction terms

to the logistic regression model. Tests for moderation require examination of model fit to determine whether the moderating relationship (interaction) improves model fit (Bennett, 2000). The change in -2LL for corresponding models was examined for statistical significance ($p < .1$) using a χ^2 significance test with a critical value of 2.706, where the change in fixed effects (DF) was 1. Where relevant, change in -2LL was noted as relevant at the .05 and .01 levels, using critical values of 3.841 and 6.635, respectively (again, where DF = 1). These steps were applied to all for-profit models. Where there was observed a significant interaction term and significant change in -2LL, this was interpreted as evidence of a moderating effect. Where there was a significant interaction term but no significant change in -2LL, this was interpreted as evidence of a weak moderating effect. Where a model showed no significant interaction terms, this was interpreted as no evidence of a moderating effect.

Of the five models with significant interaction coefficients, four showed significant change in -2LL ($p < .1$). Only the two-year grant model showed no significant change in -2LL (see table 4.2). However, the four-year grant nexus model (see table 4.3) showed a significant change in -2LL (3.527) despite not having a significant interaction term ($p < .1$). The p value for the grant nexus interaction term was near the threshold for significance ($p = .1056$). The less-than-two-year loan nexus model showed improvement over the base model with a change in -2LL of 12.769 (see table 4.1). For the two-year models, the tuition nexus model showed a change in -2LL of 6.570, the two-year loan model showed a change in -2LL of 3.507, and the two-year grant model showed a change in -2LL of 2.207 (see table 4.2). The four-year tuition model showed a change in -2LL of 2.718 (see table 4.3).

The significance of nexus interaction terms and improvement of model fit provides evidence that financial impact on college choice subsequently has a moderating effect on (1) the relationship between loan level and student persistence to attainment at LT2YR-FP schools, (2) the relationship between tuition level and student persistence to attainment at 2YR-FP schools, (3) the relationship between loan level and student persistence to attainment at 2YR-FP schools, and (4) the relationship between tuition level and student persistence to attainment at 4YR-FP schools. The significance of interaction terms but lack of significant improvement in model fit suggests that financial impact on college choice has a weak moderating effect on the relationship between grant level and student persistence to attainment at 2YR-FP schools. There is no straightforward interpretation of the four-year grant model, which had a significant improvement in model fit despite not having a significant interaction term. Though worth noting, it does not meet the criteria for moderation for this study. Figures 4.1, 4.2, 4.3, 4.4, and 4.5 illustrate the graphed interactions for each significant for-profit interaction model.

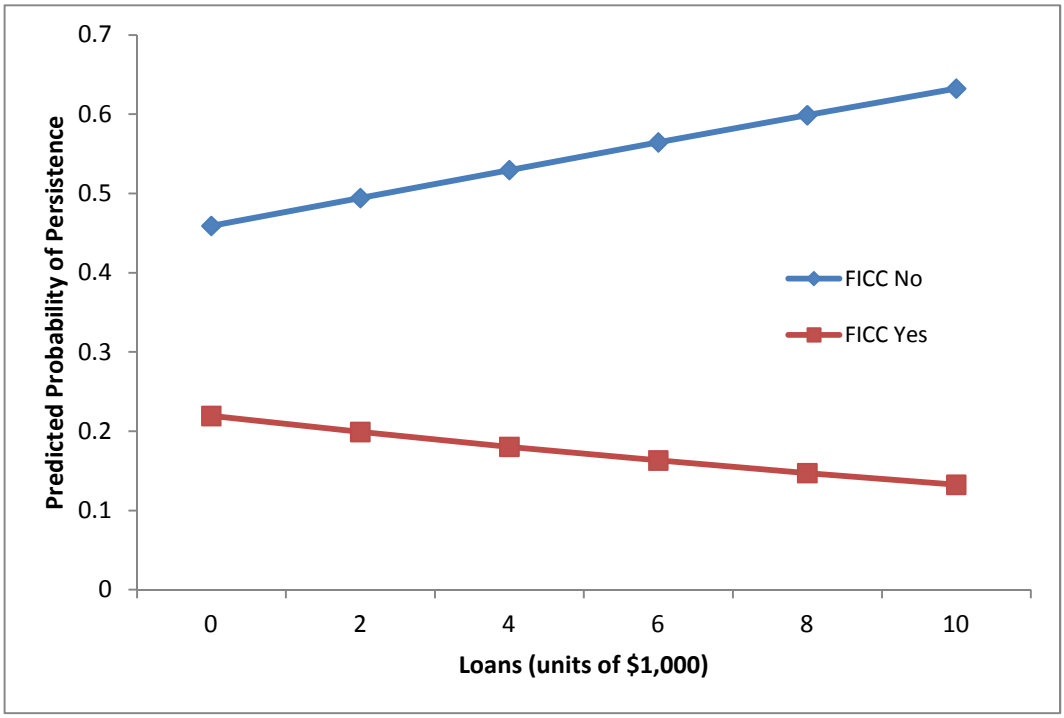

Figure 4.1. Interaction Between FICC and Loans, Less-than-two-year For-profit Institutions.

As shown in figure 4.1, students affirming that finances impacted college choice are less likely to persist than other students, regardless of loan level, at LT2YR-FP schools. The interaction between FICC and loans indicates that the difference in predicted probability of persistence between these two groups is even more pronounced at higher loan levels.

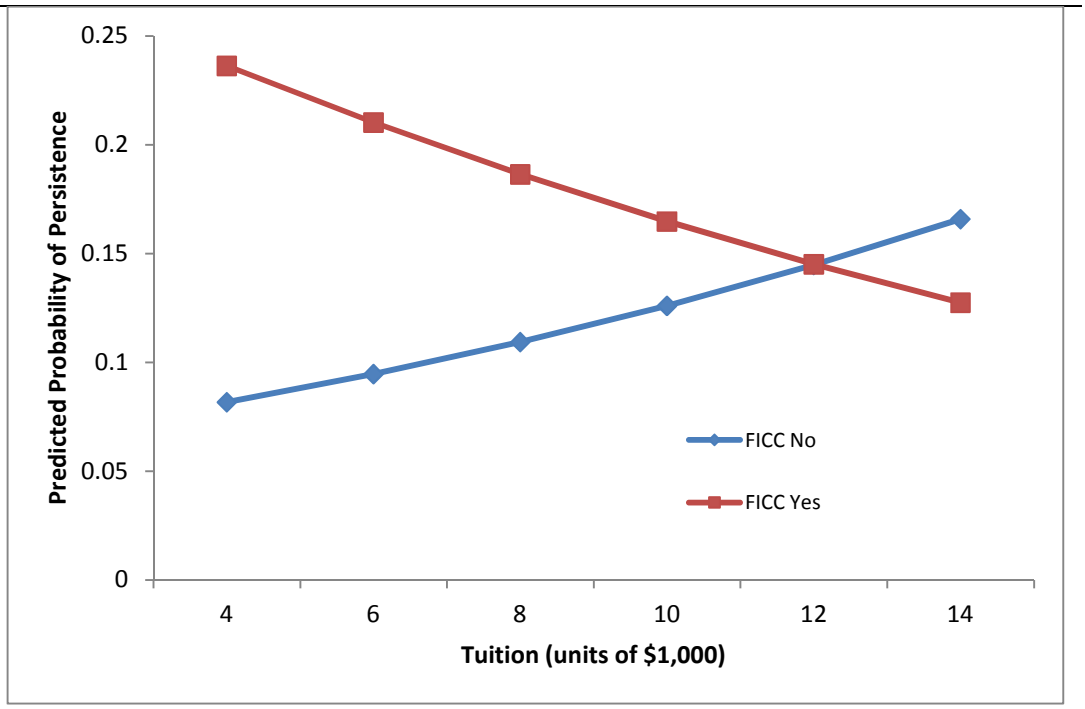

Figure 4.2. Interaction Between FICC and Tuition, Two-year For-profit Institutions.

As illustrated in figure 4.2, FICC-affirmative students at 2YR-FP institutions are predicted to have a higher probability of persistence when tuition levels are lower. However, the probability of persistence decreases as tuition increases, while tuition has a positive relationship with persistence for FICC-negative students.

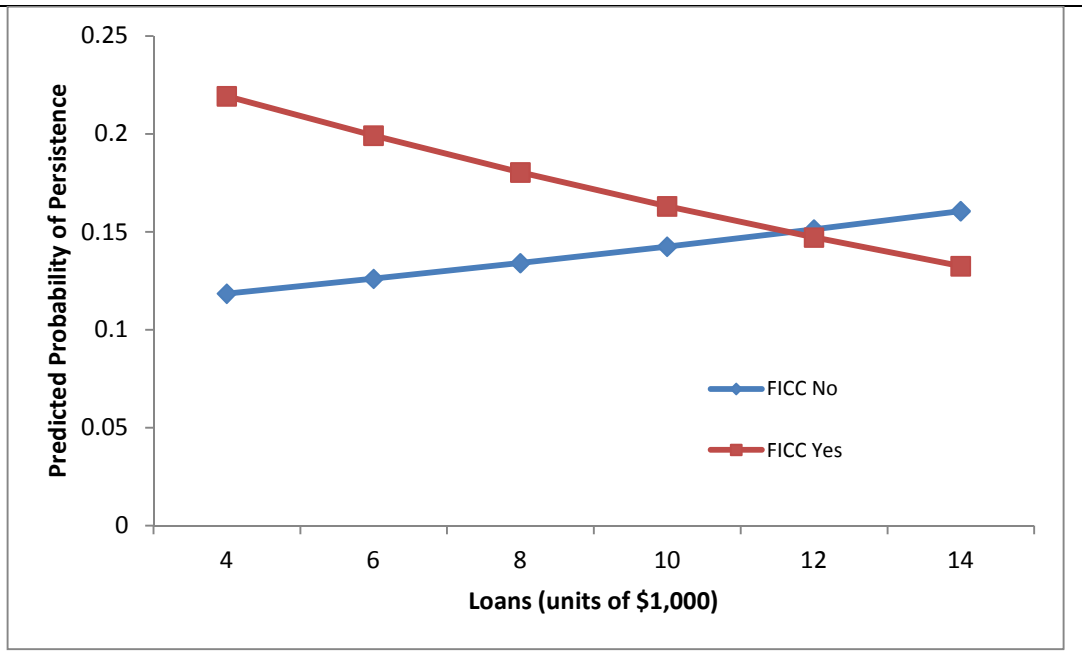

Figure 4.3. Interaction Between FICC and Loans at Two-year For-profit Institutions.

As illustrated in figure 4.3, the relationship between loans and persistence at 2YR-FP institutions mirrors that of tuition. FICC-affirmative students are predicted to have higher probabilities of persistence at lower levels, while the reverse is true at higher loan levels.

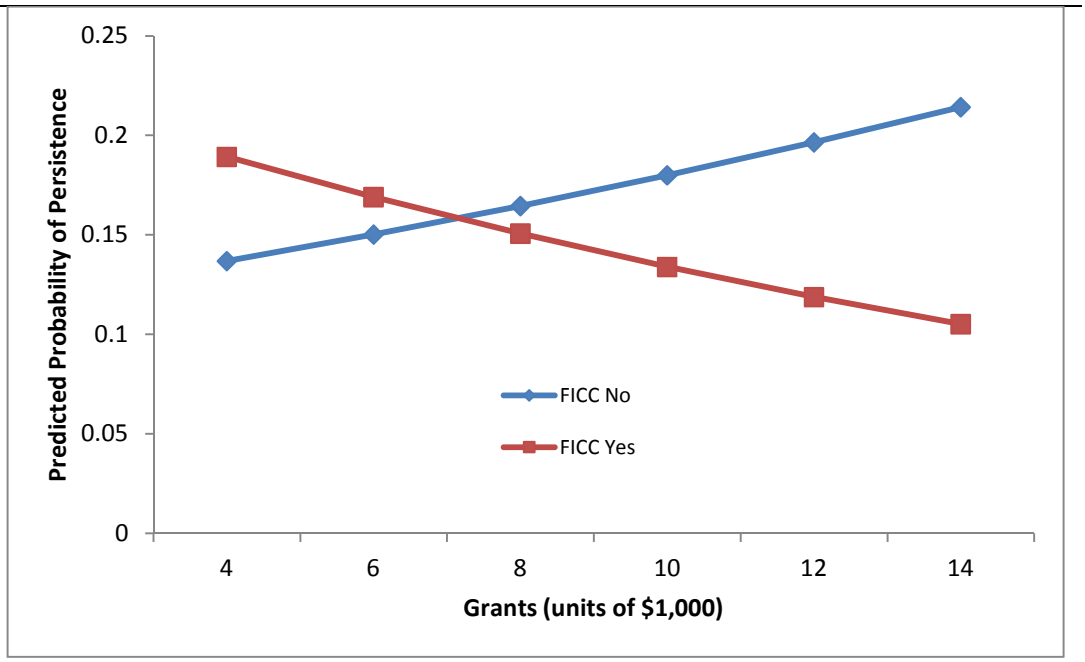

Figure 4.4. Interaction Between FICC and Grants at Two-year For-profit Institutions.

As illustrated in figure 4.4, grant aid has a similar relationship with the predicted probability of persistence at 2YR-FP schools as do tuition and loans. Grant level does not have a positive relationship with persistence for FICC-affirmative students. However, FICC-affirmative students have a higher predicted probability of persistence than FICC-negative students at lower grant levels.

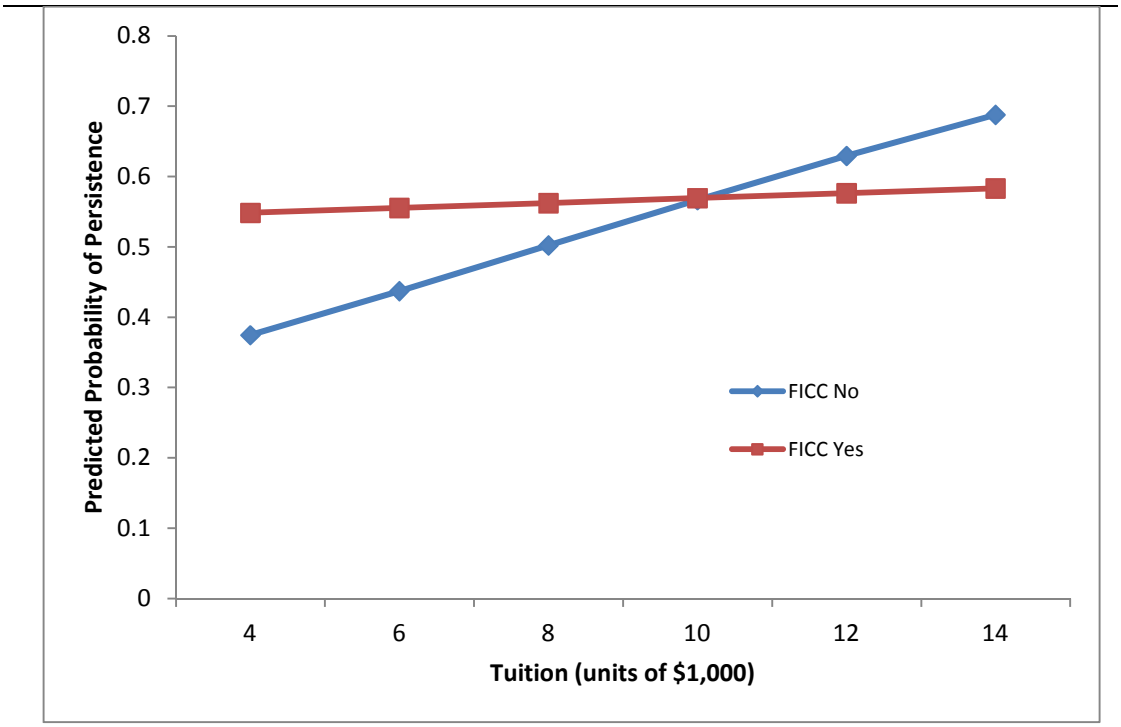

Figure 4.5. Interaction Between FICC and Tuition at Four-year For-profit Institutions.

As illustrated in figure 4.5, tuition level has virtually no impact on predicted probability of persistence for FICC-affirmative student at 4YR-FP schools. Tuition level has a positive relationship with persistence for FICC-negative students, who thus have higher predicted probability of persistence than FICC-affirmative students at higher tuition levels.

RESEARCH QUESTION THREE

Does the financial nexus of college choice and persistence differ according to institutional control (i.e. for-profit/non-profit status)?

Analysis of non-profit models. Answering question research three required application of the above analysis steps to the non-profit samples at the two-year and four-

year institution level. Outcome values were then compared to results from similar analyses on the for-profit samples at corresponding institution level. For those models that had significant interaction terms on both the non-profit and for-profit samples, an additional model was applied to a combined sample of all study sample schools at that particular level to examine potential interactions between nexus interactions and institutional sector (an ostensible three-way relationship between sector, FICC, and the financial variable). Table A.2 (Appendix A) shows the full descriptive statistics for non-profit institutions, stratified by institution level, alongside for-profit strata. Full results of the logistic regression analysis on non-profit models appear in Tables A.6 and A.7 (Appendix A).

Significance of financial impact on college choice. The variable FICC, financial impact on college choice was significant ($p < .05$) for the 4YR-NP sample in the base model and remained significant for each nexus interaction model. FICC was not significant ($p < .05$) for the 2YR-NP sample base model, nor did it become significant in any of the nexus interactions. These results provide evidence that financial impact on college choice is associated with student persistence to attainment at 4YR-NP institutions. However, there is no evidence that financial impact on college choice is related to student persistence to attainment at 2YR-NP schools. Tables 4.4 and 4.5 show the results of the base and nexus interaction regression models for 2YR-NP and 4YR-NP schools, including *p* values for key variables and model fit comparison measures.

Table 4.4

Logistic Regression Results for Two-Year Non-Profit Institutions

Model	Base Model	Tuition Nexus	Nontuition Nexus	Loan Nexus	Grant Nexus
	p	*p*	*p*	*p*	*p*
Intercept	0.6695	0.6551	0.6573	0.6558	0.6573
FICC	0.9116	0.9152	0.9087	0.9011	0.9276
Tuition	0.6011	0.1876	0.6381	0.6748	0.7662
Nontuition	0.2974	0.3174	0.9799	0.3233	0.3158
Loans	0.0834	0.1078	0.0817	0.0449 *	0.0874
Grants	0.1307	0.1178	0.1346	0.1275	0.7129
FICC*Tuition		0.2636			
FICC*Nontuition			0.2720		
FICC*Loans				0.3166	
FICC*Grants					0.0465 *
-2LL	4998.61	4997.34	4996.85	4997.66	4994.87
Δ -2LL (*5190.19*)***		1.273	1.761	0.955	3.741 †
Somer's *D*	0.229	0.232	0.227	0.229	0.234

†(interactions only) p < .1; **p* < .05; **p < .01; ***intercept-only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Table 4.5

Logistic Regression Results for Four-year Non-profit Institutions

Model	Base Model		Tuition Nexus		Nontuition Nexus		Loan Nexus		Grant Nexus	
	p		*p*		*p*		*p*		*p*	
Intercept	0.5371		0.5407		0.5564		0.5382		0.5443	
FICC	0.0002	**	0.0003	**	0.0002	**	0.0001	**	0.0002	**
Tuition	<.0001	**	<.0001	**	<.0001	**	<.0001	**	<.0001	**
Nontuition	<.0001	**	<.0001	**	<.0001	**	<.0001	**	<.0001	**
Loans	0.0017	**	0.0013	**	0.0012	**	0.0368	*	0.0014	**
Grants	0.2628		0.1157		0.207		0.2683		0.1793	
FICC*Tuition			0.0063	**						
FICC*Nontuition					0.0696	†				
FICC*Loans							0.2688			
FICC*Grants									0.3888	
-2LL	8361.24		8353.53		8356.13		8359.45		8360.36	
Δ -2LL (*9637.733*)***			7.708	**	5.112	*	1.789		0.877	
Somer's *D*	0.464		0.466		0.463		0.464		0.464	

†(interactions only) p < .1; *p < .05; **p < .01; ***intercept-only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Significance of interaction terms. Of the eight nexus interaction models on non-profit institution samples, there were three that indicated a statistically significant interaction term ($p < 0.1$) between the financial choice variable (FICC) and a financial experience variable in predicting persistence: For two-year non-profit institutions, the grant nexus model ($p = .0465$) showed a significant interaction (see table 4.4). For four-year non-profit institutions, the tuition nexus model ($p = .0063$) and non-tuition expense nexus model ($p = .0696$) showed significant interactions (see table 4.5). Like the for-

profit model results, these significant interactions suggest that the relationship between students' financial experiences and their subsequent persistence at their first institution varies depending on the role of finances in students' choices to attend colleges.

Relative Goodness-of-Fit. The goodness-of-fit of the non-profit interaction models relative to the non-profit base models were based on the change in -2LL upon inclusion of interaction terms to the logistic regression model. As with the for-profit sample models, the -2LL for non-profit models was examined statistical significance ($p <$ .1) using a χ^2 significance test with a critical value of 2.706, where the change in fixed effects (DF) was 1.

All three of the 4YR-NP models with significant interaction terms also showed a significant change in -2LL. The changes in -2LL were 3.741, 7.708, and 5.112, for the two-year grant model (see table 4.4), the four-year tuition model (see table 4.5), and the four-year non-tuition model (see table 4.5), respectively. Of the five non-profit models with non-significant interaction effects, none showed significant changes in -2LL.

The significance of nexus interaction terms and improvement in model fit provide evidence that financial impact on college choice subsequently has a moderating effect on (1) the relationship between tuition level and student persistence to attainment at four-year non-profit schools, (2) the relationship between non-tuition expense level and student persistence to attainment at four-year non-profit schools, and (3) the relationship between grant level and student persistence to attainment at two-year non-profit schools.

Combined sector models. To fully answer research question three, additional analysis was conducted to examine nexus interactions that were significant for the same model at the same institution level for both for-profit and non-profit samples. Additional

logistic regression models were applied to combined samples at each appropriate level to determine whether there was evidence of a three-way interaction between FICC, financial variables, and sector. Significance of a three-way interaction term and improvement in model fit over a model without the three-way interaction term was interpreted as evidence that the financial choice-persistence nexus varied depending on sector. In short, this step of analysis examined whether institution sector moderated the financial nexus (itself a moderating relationship). Table 4.6 summarizes the findings for logistic regression analysis for both for-profit and non-profit models.

Table 4.6

Summary of Logistic Regression Results by Model and Sector

Sector/Model		Tuition Nexus	Nontuition Nexus	Loan Nexus	Grant Nexus
For-profit	Less-than-two-year			*!	
	Two-year	*!		*!	*
	Four-year	*!			!
Non-profit	Two-year				*!
	Four-year	*!	*!		

* = significant interaction term ($p < .1$)

! = significant model improvement ($p < .1$)

Analysis showed two nexus interactions were significant in both for-profit and non-profit sample models: the tuition nexus model for four-year institutions, and the

grant nexus model for two-year institutions. Since 2YR-NP institutions are almost exclusively public, the comparison of all two-year institutions required only minor adjustments to the model, including the addition of a dummy variable which distinguished for-profit institutions from (public) non-profit institutions. However, the 4YR-NP samples are 25% private non-profit schools. In order to appropriately isolate the focus of the research question, it was necessary to create two combined four-year samples: one containing all students who attended for-profit or public non-profit schools, and one containing all students who attended for-profit or private non-profit schools. This step also helped mitigate power loss that may have occurred by comparing vastly disproportionate groups for moderation (Barron et al., 2004), as the 4YR-FP sample accounts for roughly 5% of the total four-year non-profit sample. Dummy variables were used in each to distinguish for-profit schools from the appropriate comparison group.

Two new logistic regression models were created for each of these three new samples. The first model for each combined sample contained all main-effect variables and all two-way interactions between FICC, the appropriate financial variable, and institution sector. The second model added the three-way interaction term for FICC, the appropriate financial variable, and sector. In total, six additional logistic regression models were analyzed: two models each for (1) the tuition nexus comparing four-year public non-profit (4YR-NP-PUB) and 4YR-FP institutions, (2) the tuition nexus comparing four-year private non-profit (4YR-NP-PRI) and 4YR-FP, and (3) the grant nexus comparing 2YR-NP institutions and 2YR-FP institutions. The results of the logistic regression analysis for these three models, including *p* values for key variables and model fit comparisons, are shown in tables 4.7, 4.8, and 4.9, respectively.

Table 4.7

Logistic Regression Results for Four-year Institutions, For-profit and Public Non-profit Sectors, Tuition Nexus

Model	Base		Three-way Interaction	
	p		*p*	
Intercept	0.2214		0.2347	
FICC	0.0020	**	0.0017	**
For-Profit School	<.0001	**	<.0001	**
Tuition	0.4000		0.6224	
Nontuition expenses	0.0017	**	0.0029	**
Loans	0.0242	*	0.0253	*
Grants	0.1759		0.1956	
FICC*Tuition	0.1432		0.4774	
FICC*For-Profit School	0.4051		0.0027	**
Tuition*For-Profit School	0.0046	**	0.0011	**
FICC*Tuition*For-Profit School			0.0077	**
-2LL	4697.741		4692.810	
Δ -2LL (*5500.700*)***	-		4.931	*
Somer's *D*	0.461		0.463	

*$p < .05$; **$p < .01$; ***intercept-only model

Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Table 4.8

Logistic Regression Results for Four-year Institutions, For-profit and Private Non-profit Sectors, Tuition Nexus

Model	Base		Three-way Interaction	
	p		*p*	
Intercept	0.0909		0.0846	
FICC	0.1632		0.1428	
For-Profit School	0.5192		0.9474	
Tuition	<.0001	**	<.0001	**
Nontuition expenses	0.0003	**	0.0009	**
Loans	0.0917		0.0958	
Grants	0.5105		0.5923	
FICC*Tuition	0.0257	*	0.0944	†
FICC*For-Profit School	0.8465		0.2070	
Tuition*For-Profit School	0.0755	†	0.0386	*
FICC*Tuition*For-Profit School			0.0320	*
-2LL	3585.876		3580.104	
Δ -2LL	-		5.772	*
(*4510.246*)***				
Somer's *D*	0.506		0.507	

†(interactions only) $p < .1$; *$p < .05$; **$p < .01$; ***intercept-only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Table 4.9

Logistic Regression Results for Two-year Institutions, For-profit and Non-profit Sectors, Grant Nexus

Model	Base		Three-way Interaction	
	p		*p*	
Intercept	0.6564		0.6268	
FICC	0.9080		0.9594	
For-Profit School	0.0010	**	<.0001	**
Tuition	0.0902		0.1205	
Nontuition expenses	0.2015		0.1935	
Loans	0.5595		0.5071	
Grants	0.2601		0.8790	
FICC*Grants	0.9960		0.1292	
FICC*For-Profit School	0.0267	*	0.0022	**
Grants*For-Profit School	0.1368		0.2321	
FICC*Grants*For-Profit School			0.0004	**
-2LL	5188.833		5179.574	
Δ -2LL (*5413.211*)***	-		9.259	**
Somer's *D*	0.251		0.252	

†(interactions only) $p < .1$; *$p < .05$; **$p < .01$; ***intercept-only model
Model controlled for age, gender, ethnicity, mother's education, high school credential, dependency status, marital status, income-poverty ratio, aspirations, attendance intensity, employment while enrolled, and college gpa.

Significance of interaction terms. The logistic regression analysis found that all three combined-sector models had significant three-way interaction terms ($p < 0.05$). The two-year grant nexus combined model (see table 4.9; $p = .0004$), the four-year tuition nexus public/for-profit combined model (see table 4.7; $p = .0077$), and the four-year tuition nexus private/for-profit combined model (see table 4.8; $p = .032$) showed significant interactions between financial impact on college choice, the financial variable,

and institution sector as they related to persistence at first institution. Consistent with initial observations, these findings provide further evidence that the relationship between students' financial experiences and their subsequent persistence at their first institution varies depending on the role of finances in students' choices to attend colleges and that, for specific types of financial measures, this interaction varies by sector at different institution levels. Full results of the logistic regression analysis of combined-sector models appear in Tables A.8, A.9, and A. 10 (Appendix A).

Relative Goodness-of-Fit. The goodness-of-fit of the combined-sample interaction models relative the combined sample base models were based on the change in -2LL upon inclusion of three-way interaction terms. Just as with the earlier models, significance determined by examining whether the change in -2LL was statistically significant ($p < .1$) using a χ^2 significance test with a critical value of 2.706, where the change in fixed effects (DF) was 1. Where relevant, change in -2LL was noted as relevant at the .05 and .01 levels, using critical values of 3.841 and 6.635, respectively (again, where DF = 1).

The change in -2LL was significant for each three-way interaction model. The 4YR-NP-PUB/4YR-FP comparison showed a change in -2LL of .4.931 (see table 4.7) ; the 4YR-NP-PRI/4YR-FP comparison showed a change in -2LL of 5.772 (see table 4.8). The 2YR-NP/2YR-FP comparison showed a change in -2LL of 9.259 (see table 4.9).

The significance of three-way interaction terms and improvement in model fit provide evidence of three-way interactions between (1) the financial impact on college choice, grant level, and institution sector as the three relate to persistence at two-year institutions, and (2) the financial impact on college choice, tuition level, and institution

sector as the three relate to persistence at four-year institutions. These findings suggest that (1) the financial impact on college choice and institution sector both moderate the relationship between tuition level and student persistence at four-year institutions, and (2) the financial impact on college choice and institution sector both moderate the relationship between grant level and student persistence at two-year institutions. Figures 4.6, 4.7, and 4.8 illustrate the graphed interactions for each significant combined-sample nexus model.

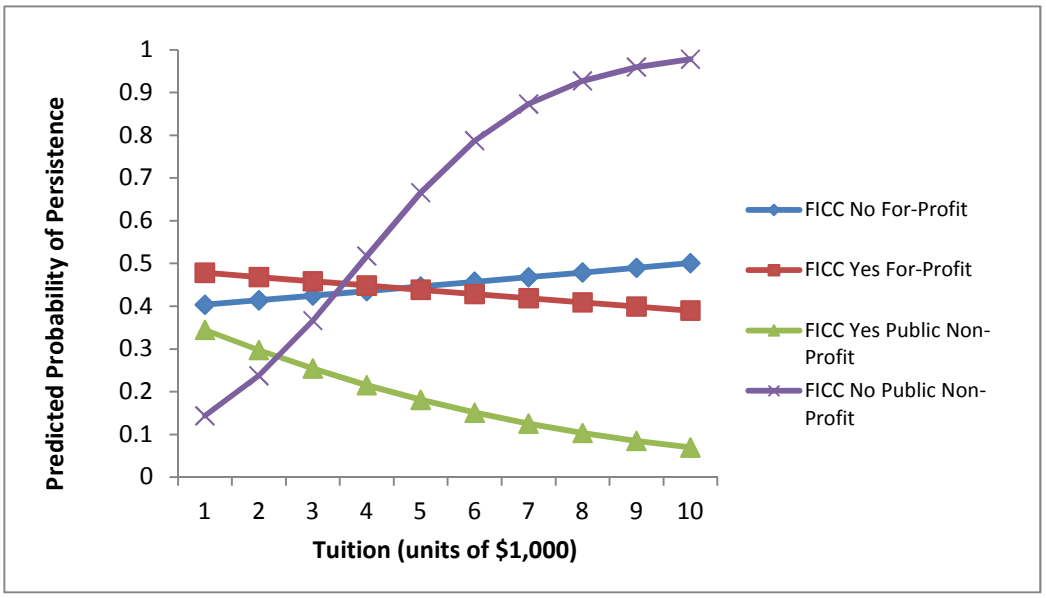

Figure 4.6. Three-way Interaction Between FICC, Tuition, and Sector (For-Profit vs. Public Non-profit) at Four-year Institutions.

Figure 4.6 illustrates that tuition has a drastically different relationship with the predicted probability of persistence for FICC-negative students at four-year public non-profit schools than for all other groups. Tuition is predicted to have a negative relationship with predicted probability of persistence for FICC-affirmative students at

4YR-FP and 4YR-NP-PUB institutions, though the former are predicted to have higher levels of persistence than the latter regardless of tuition levels. Though illustrative of the difference in groups, the predicted probability of persistence for FICC-positive students at for-profit institutions in this model is different from the relationship illustrated in the for-profit only model in figure 4.5. This inconsistency may be due to the fact that for-profit students comprise a relatively small proportion of students in this comparison, which may affect the combined model's parameter estimates.

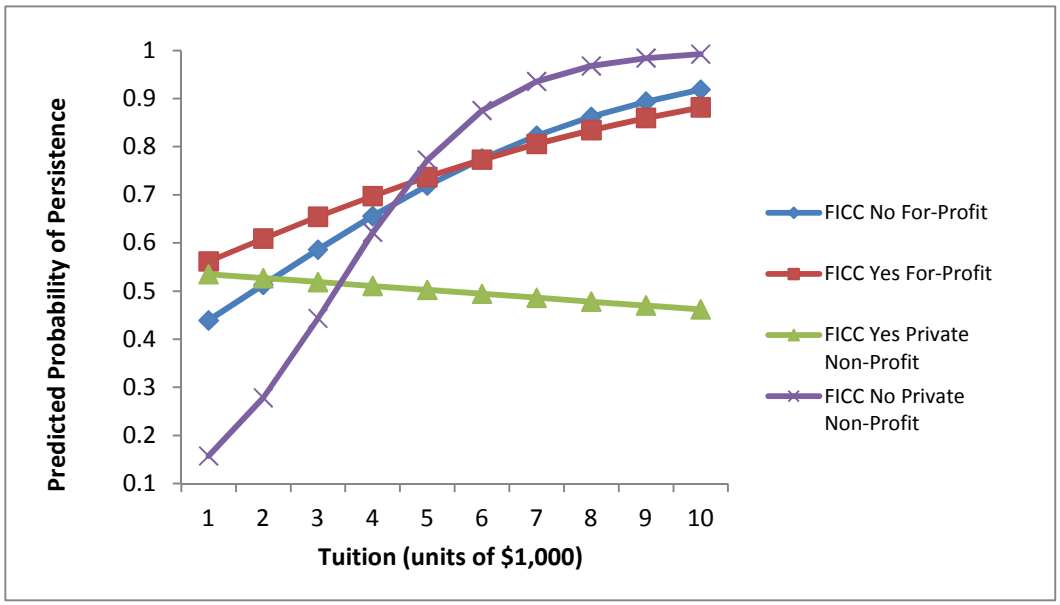

Figure 4.7. Three-way Interaction Between FICC, Tuition, and Sector (For-Profit vs. Private Non-profit) at Four-year Institutions.

Figure 4.7 shows that, for FICC-negative students at 4YR-NP-PRI institutions, tuition has positive relationship with persistence similar to those students at public schools (see figure 4.6). This model predicts that tuition has a positive relationship with

predicted probability of persistence for FICC-affirmative and –negative students at 4YR-FP schools.

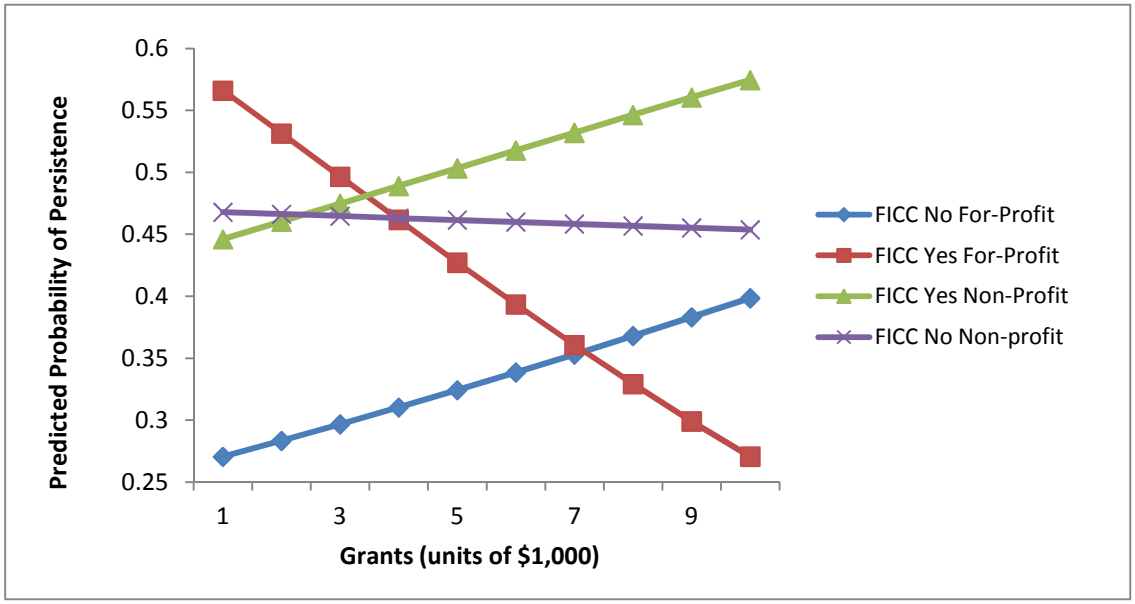

Figure 4.8. Three-way Interaction Between FICC, Grants, and Sector (For-profit and Non-profit) at Two-year Institutions

As illustrated in figure 4.8, the relationship between grant level and predicted probability of persistence is reversed, relative to FICC response, between for-profit and non-profit institutions at the two-year level. In 2YR-FP institutions, grant level has a negative relationship with persistence for FICC-affirmative students and a positive relationship with persistence for FICC-negative students. In 2YR-NP institutions, grant level has a positive relationship with persistence for FICC-affirmative students and a negative relationship with persistence for FICC-negative students.

SUMMARY OF FINDINGS

Examination of the financial nexus of college choice and persistence at for-profit institutions included five logistic regression models (one base, four nexus interaction) for each institution level: less-than-two-year institutions, two-year institutions, and four-year institutions. Analysis results suggest there is no statistically significant relationship between financial impact on college choice and student persistence at first institution. However, examination of the nexus interaction models suggest that the relationship between certain finances and persistence is moderated to varying degrees by financial impact on college choice at less-than-two-year institutions (loans), two-year institutions (tuition, loans, and grants), and four-year institutions (tuition).

For comparison, similar models were analyzed for non-profit samples at the two-year and four-year level. Results indicated that financial impact on college choice was related to persistence at 4YR-NP institutions, but not 2YR-NP institutions. Examination of nexus interaction models on the non-profits samples suggests that the relationship between finances and persistence is moderated by financial impact on college choice at two-year institutions (grants) and four-year institutions (tuition, non-tuition expenses).

The two-year grant nexus model and four-year tuition nexus model were the only models statistically significant for both for-profit and non-profit models. Modified versions of these models were applied to combined samples of schools at each respective level for contrast. Analysis of three-way interactions and model fit suggest that the financial nexus between college choice and persistence is moderated by institutional sector at two-year institutions (grants) and at four-year institutions (tuition).

CHAPTER 5: CONCLUSIONS AND DISCUSSION

This study examined student choice and persistence at for-profit institutions to determine whether influences on college choice have subsequent effects on persistence to attainment. Logistic regression models controlling for student background were used to examine both the direct effect of FICC (financial impact on college choice) on persistence, as well as its moderating effect on the relationship between finances and persistence. Students attending less-than-two-year, two-year, and four-year institutions were analyzed in separate samples. Samples of students attending non-profit schools were analyzed using similar models. Where results of the analyses indicated similar results between sectors, combined sample models were examined to determine whether sector moderated the moderating relationship that FICC had on the finances-persistence relationship. This study sought to provide insight on patterns of persistence and degree completion for students attending schools that have been a source of controversy over the last several years. Additionally, this study expands exploration of the nexus theory of college choice and persistence to a population which had not previously been studied, but for whom the theory is uniquely suited.

The results of the data analysis point to several conclusions related to the research questions. First, FICC has no direct relationship with persistence to attainment at for-profit institutions. Second, FICC does moderate the relationship between some financial measures and persistence to attainment. There is evidence of FICC moderating several relationships: (1) the relationship between loans and persistence at LT2YR-FPs, (2) the

relationship between tuition and persistence at 2YR-FPs, (3) the relationship between loan level and student persistence to attainment at 2YR-FPs, and (4) the relationship between tuition level and student persistence to attainment at 4YR-FPs. There is also evidence of FICC having a weak moderating effect on the relationship between grant level and student persistence to attainment at 2YR-FPs.

Third, there is evidence of similarities and differences between the effects of FICC in for-profit schools and its effect on non-profit schools at similar levels. FICC had a significant relationship with student persistence at four-year non-profits, but not two-year non-profits. Also, FICC does moderate several relationships in non-profits: (1) the relationship between tuition level and persistence to attainment at 4YR-NPs, and (2) the relationship between non-tuition expenses and persistence at 4YR-NPs, and (3) the relationship between grant level and student persistence to attainment at 2YR-NP schools.

Two of the five significant interaction terms in for-profit schools were significant at the same institution level for non-profit schools. Both institutional control (profit sector) and FICC moderate the relationship between tuition and persistence when comparing 4YR-FP and 4YR-NP-PUB, and likewise when comparing 4YR-FP and 4YR-NP-PRI. Also, sector and FICC moderate the relationship between grants and persistence when comparing 2YR-FP and 2YR-NP schools.

The financial nexus theory of college choice and persistence predicts that the financial influences on college choice also impact persistence decisions. Nexus theory also predicts that financial influences on college choice impact the way finances affect persistence decisions. Results of the study suggest that there is a complex relationship

between the financial influences of college choice and subsequent persistence decisions at for-profit institutions. Statistical analysis indicates that financial choice influences moderate relationships between some financial measures and persistence to attainment at some levels of for-profit institutions. However, several findings suggest that the financial nexus of college choice and persistence does not sufficiently explain the relationships between finances, college choice, and persistence to attainment at these schools.

For one, financial impact on college choice has no significant direct impact on student persistence at for-profits. Also, the extent to which the moderating relationships vary between levels and the degree to which they differ from non-profits suggests that there are complexities to these relationships which nexus theory does not address. Finally, although the study found moderating relationships as nexus theory predicted, the direction and strength of several moderating relationships is not consistent with the underlying theoretical framework. Counterintuitive findings, such as higher tuition being positively associated with persistence where finances impacted college choice, do not initially appear congruent with the theoretical process by which students compare their experiences and expectations. Though the implicit contract between student and institution may be a valid theoretical construct, the findings of this study suggest that interpreting it may require drawing from theory outside of the choice-persistence nexus.

INTERPRETING THE FINDINGS

One important note about the results of this investigation: Although this study examined for-profit colleges and ways that they differ from non-profit schools in areas related to persistence to attainment, the findings of this study should not be construed as any form of qualitative comparison. The nexus framework, and in particular the

theoretical violation of an "implicit contract" between the student and institution, does resemble anecdotes about misleading claims and student dissatisfaction at some for-profit institutions. However, this study did not examine these elements directly. Statistically significant nexus interactions indicate only the presence of relationships between influences; they do not indicate that perceived violations of the implicit contract occur more often at any specific type of institution. The findings of this study provide no information on claims institutions make about their programs, levels of student dissatisfaction, or the frequency with which students leave institutions due to either. Further, this study was not concerned with how sectors compare on any particular outcome measure, and the findings cannot justifiably be used to address any such issue. Any interpretation making such claims would be erroneous.

Answering the research questions. The results of the logistic regression analysis inform several conclusions related to the research questions which framed this study. Although this study's combination of theoretical background and population of interest make it unique in persistence literature, several findings relate to prior research related to for-profit schools, persistence, and nexus theory. The differences between the institution-level samples builds on Chung's (2009) findings that students attending for-profit schools are quite heterogeneous. Chung found stark differences between students attending less-than-two-year, two-year, and four-year for-profit institutions. Although the methodology differs—Chung used Wald tests to identify statistically significant differences between for-profit and non-profit student samples—the current study examined predicted probabilities of persistence to completion using similar stratification that were used to examine descriptive statistics.

Research question one: *Does the impact of finances on college choice have a subsequent effect on student persistence to completion at for-profit institutions?*

There was no statistically significant relationship between FICC and the criterion variable in any of the for-profit models at any level. There is therefore no evidence that the financial influences on college choice have any direct association with student persistence to completion at for-profit institutions. This suggests that the financial choice-persistence nexus does not fully account for student persistence patterns at these schools.

Prior nexus studies, using data from earlier versions of NPSAS, were able to divide the financial influences on college choice into subcategories of fixed costs, like tuition and financial aid, and controllable costs, like living expenses. These studies consistently found that students choosing an institution due to low tuition was negatively associated with persistence. Where examined, choosing an institution due to low living costs was negatively associated with persistence for low income and high income students. However, examinations of financial choice variables showed that choosing a school due to financial aid, not tuition, was significantly and positively associated with persistence (St. John et al., 1996; Paulsen & St. John, 1997; St. John et al., 2005).

Prior nexus studies have only examined non-profit institutions, so these are not necessarily comparable to the for-profit models. The 4YR-NP samples from the current study showed significant relationships between FICC and persistence, which supports these studies' findings that financial choice variables do have a subsequent impact on persistence decisions at four-year non-profit schools. However, the current study's findings that the impact of financial choice variables varied by institution type supports

findings by Hwang (2003). Though current findings support past studies of significant direct effects in one subsection of higher education institutions, the findings of this study do not support broad application of nexus theory as a valid model of higher education persistence in all levels and sectors.

Research question two: *Does the impact of finances on college choice moderate the relationship between financial experiences and students' persistence at for-profit postsecondary institutions?*

Caution must be taken in interpreting the findings of this research question. The models used in this study report the association between financial aspects of choice and persistence to attainment. However, the data used for this study do not include information regarding whether students' costs or aid changed between their choice of college and the end of their enrollment, nor should the results be interpreted as claiming such. Each observation in the data represents a static measure of tuition, non-tuition expenses, loans, and grants associated with a particular student at a particular institution. It is more appropriate to interpret the variability of financial variables as differences between instances rather than changes in the level of those variables. The clearest example of this distinction is the predicted change in probability illustrated in figures 4.1 through 4.8. While logistic regression results would typically justify statements of predicted change in probability of persistence per $1,000 increase in, for example, tuition, such statements are not appropriate to this study. It would be more appropriate to state predicted *difference* in probability of persistence per $1,000 of tuition *charged*.

This distinction is a matter of interpretation, not a limitation. Data on changing levels of financial variables, though relevant to studies like this one, are not essential to

examine the choice-persistence nexus. Prior nexus research described students finding college to be more expensive than anticipated as an illustration of experiences not matching expectations (Paulsen & St. John, 2000). However, there is no assertion that the scope of nexus theory is restricted to situations where cost or aid fluctuate. The theory does not specify it, no nexus study has specifically examined it, and interpretation of the results as responses to changes is not appropriate to the methodology. The choice-persistence nexus is concerned with differences between student expectations and *perceived* fulfillment of said expectations. Though fluctuations in financial variables could obviously impact students' perceptions, a "violation" of the implicit contract is ultimately the student's interpretation of her experience.

Results of the analysis show that the financial impact on college choice has a moderating affect on the relationship between finances and persistence to completion at for-profit institutions. This moderating relationship was present for loans at LT2YR-FPs; for tuition, loans, and grants at 2YR-FPs; and for tuition at 4YR-FPs. This evidence supports the assertion by nexus theory that student expectations related to finances have an effect on how financial experiences are perceived and evaluated in relation to persistence. Although nexus theory predicts interactions between college choice variables and financial experience variables, these moderating relationships call into question the theoretical comparison between expectations and experiences.

It would be logical to hypothesize that increased costs would be negatively associated with persistence and that higher aid levels would be positively associated with persistence. Further, it would be logical if the degree of these respective associations (that is, the predicted change in probability of persistence) was greater for students who

reported that finances impacted college choice. The results do not support such hypotheses. For each of the significant interactions in for-profit models, the financial variable—cost or aid—is positively associated with persistence for students whose college choice was not impacted by finances. For each significant interaction, the financial variables were negatively associated with persistence for FICC-affirmative for-profit students at all levels, except one. The exception was tuition at 4YR-FP schools, which appeared to have no effect on persistence for FICC-affirmative students (see figures 4.1 through 4.5). Thus, in addition to unintuitive main effects, there were unintuitive interaction effects: In the two-year for-profit model, for example, grant aid has a negative association with persistence for students whose college choice was impacted by finances but a positive association for students whose college choice was not impacted by finances.

Drawing comparisons between specific findings of this study and those from prior nexus studies is complicated due to differences in methodology and changes in the way data were coded in the national data set. The current study used interaction terms where prior studies have not, and prior nexus studies utilized more specific categories of finances related to college choice. However, several points of agreement are worth noting. The current study supports findings by Mbadugha (2000) that some aid is negatively associated with persistence for students attending two-year non-profit schools (Mbadugha examined community college students). However, the current study found a significant relationship only for loans in one model, whereas Mbadugha found a significant relationship only with grants, and only for full-time students. Also, though the two studies examined different populations, findings from the current study regarding

non-tuition expenses are inconsistent with Mbadugha's. The current study found non-tuition expenses to have a greater direct impact on persistence than other financial variables, while Mbadugha found tuition to have a greater impact. However, the current study supports Hwang's (2003) findings that tuition is positively associated with persistence for four-year non-profit schools,

Research question three: *Does the financial nexus of college choice and persistence differ according to institutional control?*

Two nexus relationships were significant for both for-profit and non-profit schools: tuition at four-year institutions and grants at two-year schools. Further examination was based on three combined-sample models: a four-year tuition nexus model for for-profit and public non-profit schools, a four-year tuition nexus model for for-profit and private non-profit schools, and a two-year grant nexus model for for-profit and non-profit schools. All three showed significant 3-way interactions between sector, FICC, and the financial variable as they related to persistence to attainment. Additionally, all three showed a significant change in -2LL as a result of adding the three-way interaction term to the model.

There is evidence of a moderating effect on the nexus relationship (i.e. a moderation of the moderating effect of FICC on the relationship between finances and persistence) for grants at two year institutions and for tuition at four-year institutions. As illustrated in figure 4.11, the difference in predicted probability of persistence per $1,000 tuition charged is similar between for-profit and public non-profit institutions for FICC-affirmative students. There is a huge difference, however, between the difference in predicted probability of persistence for FICC-negative students. Higher tuition is

positively associated with persistence for FICC-negative students at public non-profit schools to a substantially greater degree than FICC-negative students at for-profit schools. The private non-profit FICC-negative students show a similar curve, though the predicted differences between private non-profit and for-profit are less pronounced. In fact, tuition is positively associated with persistence for FICC-positive for-profit when compared to private non-profit, but the same group has a negative relationship when compared to public non-profit. This apparent contradiction may reflect the fact that for-profit students comprise a small proportion of both combined four-year samples.

By contrast, the for-profit and public non-profit two-year schools show nexus effects which differ both in degree and direction. Grants are positively associated with persistence for FICC-affirmative students at non-profits yet negatively associated with persistence for FICC-affirmative students at for-profits. Similarly, grants are negatively associated with persistence for FICC-negative students at public non-profits and positively associated with persistence for FICC-negative students at for-profits. Interestingly, the predicted impact of grants on probability of persistence is nearly identical for FICC-negative students at for-profits and FICC-affirmative students at public non-profits.

The current study supports findings of Paulsen and St. John (1997, 2002) and Hwang (2003) that the nexus relationships between college choice and persistence affect students attending different types of institutions in different ways. Also, Paulsen and St. John (2002) found that financial variables (tuition, loans, and grants) had stronger negative association with persistence for low-income students than for middle- and high-income students. Though the current study did not examine the different influences of

the financial variables on students at different income levels, observed variations in socioeconomic levels and effect of financial variables between sectors are consistent the prior study's findings. The for-profit samples were predominantly lower quintiles of income-to-poverty ratio, and financial variables negatively affected FICC-affirmative students in for-profit schools in a manner that was not observed in the non-profit samples.

Interpreted through the choice-persistence nexus theoretical model, these sector interactions would suggest that students attending for-profit schools form expectations or evaluate experiences related to finances differently than their non-profit counterparts. Also, the data suggest that in two-year institutions, grants have contradictory effects on persistence in different sectors. The statistical results of the study show significant three-way interactions, and these interactions appear to demonstrate complex moderating effects between sector, expectations, and experience. However, the theoretical evaluation of the implicit contract between the student and the institution does not appear consistent with these observations. The choice-persistence nexus, then, does not sufficiently explain these findings.

No interpretation of expectations, experiences, or comparisons thereof addresses why tuition would have such a strong positive relationship with just one category of student (FICC-negative at public non-profit schools). Also, it is not immediately apparent why grant aid would have totally opposite effects on students' evaluations of their experiences at different sectors of two-year schools, as would be suggested by a straightforward interpretation of the theory. As discussed below, these unusual findings are believed to be a result of a misinterpretation of the financial variables' effects. Nexus theory describes the relationship between student and institution as the "implicit

contract," and FICC provides a valid albeit vague representation of students' expectations. However, while the financial measures may represent elements of students' experiences, the association between these experiences and student persistence does not appear to reflect a simple matter of students responding to the actual dollar values of cost or aid.

Re-examining nexus theory. This study examined significant interactions between FICC and finances in predicting student persistence. Results of the analysis indicate a moderating relationship between the financial choice variable and financial experience variables as they relate to persistence in several models. However, the financial nexus between college choice and persistence is not necessarily the best explanation for these findings. Several aspects of the models used in this study suggest that nexus theory does not sufficiently address the relationship between finances, college choice, and persistence.

The main effects of financial variables for several models yielded unintuitive findings. Several statistically significant relationships appear inconsistent with expected price response behaviors in a financial impact model. For one, this study found positive associations between tuition level and persistence just as prior nexus studies had. The current study found significant, positive relationships between tuition and persistence in each of the four-year non-profit models. The tuition main effect was not significant in the for-profit models except for the two-year and four-year tuition nexus models and the four-year grant nexus model. However, in each of these models tuition was positively associated with persistence. Prior studies found positive associations between tuition and persistence at four year schools and interpreted this phenomenon as students perceiving

higher tuition levels as signals of quality (Hwang, 2003). This would not explain other unexpected associations among the finance variables. Non-tuition expenses had a statistically significant positive association with persistence to attainment at less-than-two-year for-profit schools. These findings are initially counterintuitive, as they seem to indicate that higher costs are associated with higher levels of persistence to attainment.

There were similarly unintuitive relationships among the nexus interactions in the current study. The non-tuition expense nexus interaction was significant ($p < .1$) in the four-year non-profit sample model. Non-tuition expenses were positively associated with persistence for students who responded affirmatively on FICC as well as those who did not (see Figure 4.8). The difference in predicted probability of persistence per $1,000 of non-tuition expenses charged was actually higher for students who reported that finances affected their choice of institution. Although nexus theory predicts moderating relationships among these variables, it is difficult to interpret this finding in a way that is consistent with the post-matriculation re-evaluation of the implicit contract between the student and the institution. The theoretical framework of the choice-persistence nexus may require a more comprehensive explanation.

One possible explanation for these relationships is a confounding influence. Additional institutional characteristics not represented in the models, but which are associated with cost or finances, may also affect student persistence. This could mean that the observed relationship between finances and persistence does not actually depict the influence of cost and aid on students' persistence decisions. The significant effects of cost and aid variables may represent latent institutional factors which impact student persistence to attainment. If this hypothesis is correct, then future studies may benefit

from using a more comprehensive model. It may be beneficial to re-examine the way that students' expectations, experiences, and perceptions fit into the theoretical model using a multilevel model approach which captures both student and institution effects.

Interpretation of financial variables. Though the current study found significant interactions as predicted by nexus theory, the nature of these interactions is not consistent with the theoretical process that supposedly drives them. This study found counterintuitive nexus results such as negative associations between grant level and persistence for students who affirmed finances impact their college choice, while at the same time grants had a positive association with predicted persistence for students for whom finances did not impact college choice. Similar oddities were observed in the direct effects between financial variables and persistence, such as tuition and non-tuition expenses being positively associated with persistence in some models. Fully explaining these unexpected effects may require a new interpretation of some of the financial variables' influence in the regression models.

Financial Impact on College Choice. FICC was associated with several significant interactions with financial variables as they related to student persistence but produced no significant main effect with persistence in any for-profit model. This college choice-related variable appears to reflect students' expectations. However, it may reflect a more general expectation about the overall program than a specific assumption about the financial issues a student would face. FICC, as a binary variable, provides limited information about the formation of students' expectations, which can be a complex process.

One limitation of the study is that the models contain no *direct* measurement of student expectations or perceptions of their college experiences. Expectations, however, can be gauged. Though the BPS survey does not explicitly ask what students expected entering college, questions about reasons for attending college provide suitable proxies.

The variable FICC is based on student responses to the survey question which reported whether they considered cost, affordability, or other financial issues when choosing a college. Students' responses to this question reflect an implicit expectation that the information on which they base their college choice accurately reflects cost, affordability, and financial issues. Still, this binary variable may not fully capture the process of forming expectations or how these expectations affect subsequent decisions. For example, a student may choose to attend her first choice of college based predominantly on academics, prestige, or location. Having not seriously weighed finances into their decision to attend, she would have answered "no" to the FICC survey question. However, the student may still have formed expectations about financial issues prior to matriculating and may choose to leave the institution if the implicit contract based on those expectations is violated. In such a situation, the variable FICC would provide incomplete information about the students' expectations.

Thus, there may still be dynamics to the financial nexus of college choice and persistence that the current study did not detect. FICC, then, does not indicate *whether or not* students formed financial expectations about their college experience. Rather, it is assumed that all students form expectations of some kind and that FICC indicates the importance of perceived value (given the cost) of the educational experience at the chosen institution. Future studies may benefit from including variables which more

directly measure students' expectations of their college experience and the institution they plan to attend. As noted previously, specific categories of financial aspects of college choice were not available in the latest version of the BPS. However, it must be noted that any valid measure of student expectations would necessarily be self-reported. Due to the nature of the theoretical relationship between expectations and experiences, any measure of student expectations can only be captured by student responses. While FICC is limited due to its lack of specificity, the fact that it is a self-reported variable is consistent with the theory being examined.

Unlike expectations, student perceptions of their college experience are not represented in the model, even by proxy. As noted under limitations in chapter 3, the dependent variable does not distinguish between students who left for financial reasons and those who may have left for other reasons. It should be noted that the BPS initial and follow-up surveys included questions specifically for students that had left their initial institution, asking for specific reasons why they left. Among the possible coded answers were "financial reasons," or "dissatisfaction with program." This information was not included in the models for the current study due to its limited availability. There was not sufficient data for this variable for the population of primary interest, students attending for-profit institutions. Future studies may benefit from inclusion of variables which measure students' evaluation of their college experience after matriculating.

Tuition. Increased costs would not be expected to have a positive effect on student persistence. However, tuition is positively associated with persistence in several models and is involved in unintuitive significant interaction effects in several more. Although prior studies interpreted tuition level as a signal of quality, this does not appear

to sufficiently describe a reversal of the expected price response behavior. Instead, the main effect of tuition in the current study is believed to be a latent institutional factor or factors which are associated with cost and which predict persistence. The most likely confounding factor is institution selectivity. Institutions which charge higher tuition and fees may have higher admissions standards. Institution selectivity has a positive association with persistence to completion (Melguizo, 2008), and this holds true even for traditionally disadvantaged populations (Alon & Tienda, 2005). This would explain why tuition had a significant main effect on non-profits, but not for-profits. Many for-profits are open-admissions, meaning there is little to no variance in terms of selectivity. Since there is no academic barrier to entry, there would be no confounding influence on the relationship between tuition and persistence.

Institutional efforts to improve retention may also play a confounding role. Schools which charge higher levels of tuition may provide more support and interventions for students at risk of leaving. Institutions which have a climate of retention may have higher persistence levels overall (Patton, Morelon, Whitehead, & Hossler, 2006; Moore & Fetzner, 2009; Oseguera & Rhee, 2009; Tutty & Ratliff, 2012).

Nexus effects at for-profits involving tuition show a positive association with persistence for students for whom finances were not an impact on college choice, but this does not hold true students affirming FICC. Tuition has a negative impact on FICC-affirming students at two-year for-profit schools and essentially no impact on FICC-affirming students at 4YR-FP schools. Tuition has a positive effect on both FICC-affirmative and FICC-negative students at 4YR-NP schools, though the impact is less for the former.

If selectivity is confounding the effect of tuition, then these results may simply suggest that students who choose college based on finances, unsurprisingly, are less likely to attend institutions with high tuition, high selectivity, and high completion rates. However, if the latent institutional factors include retention efforts, then this suggests that the institutional factor related to persistence does not have the same positive effect on students for whom financial impact affected college choice, or that its positive influence does not overcome the effects of high tuition for those students.

Grants. Grants had no significant main effects in any model, but grant nexus effects were significant in 2YR-NP and 2YR-FP institutions. However, the relationship was inverted: In for-profit institutions, grants were positively associated with persistence for FICC-negative students and negatively associated with persistence for FICC-affirmative students. The reverse was true for non-profit institutions. These results may be due to differences in the types of grants offered. Or, this difference may be influenced by drastic differences in cost and, by extension, the proportion of cost which grants cover.

High levels of grant aid at 4YR-NP institutions would usually indicate steep merit-based discounts offered by high-tuition institutions with similarly high completion rates. However, this would not be the expected cause at two-year institutions. Higher levels of grants at two-year institutions are more likely to indicate need-based federal aid such as Pell grants. The average level of grant aid at two-year for-profits ($2,926.89) is roughly two-and-one-half times the grant level at two-year non-profits ($1,151.46). However, the average tuition level at two-year for-profits ($8,854.45) is over six times the level at non-profits ($1,372.86). The difference between combined tuition and non-

tuition expense levels is even more striking: $16,194.86 at two-year for-profit compared to $6,801.74 at two-year non-profits.

Considering these figures, units of $1,000 in grants mean two very different things depending on the institution, and predicting differences in probability of persistence for the two sectors appears to reflect this. These results may mean that, even when controlling for tuition and non-tuition expenses, grants do not have the same impact on student persistence at for-profits institutions at the two-year level due to the substantially higher costs associated with those institutions. Also, the source of grants may affect the way students perceive it, especially as these perceptions relate to persistence at first institution attended.

The variable "grants" used in this study uses the total combined amount of all non-loan aid from all sources—federal, state, institutional, or other. A comprehensive model of student persistence would benefit from examining these differences seperately. Institutional aid may be associated with the institution as part of the college experience, since it would be lost if the student left the institution. Federal aid like Pell grants may be used at any eligible institution the student chooses and may affect students' decisions much differently. For-profit institutions traditionally do not provide institutional aid. Likewise, grants at two-year non-profit institutions would be comprised mostly of federal and state grants. The distinction between sources of aid is therefore not critical to the current study in general, nor to the cross-sector comparison of the grant nexus models at the two-year level).

Past studies have noted negative associations between aid and persistence; these findings were interpreted as evidence that the aid given was frequently insufficient to

meet student need (St. John et al., 2005). This suggests a possible explanation for the current study's findings for two-year schools: Grant aid may be sufficient to meet the needs of students attending non-profit schools (like community colleges), but not sufficient to meet the needs of students attending for-profits. However, since high levels of grants are associated with high levels of cost, a better interpretation may be that students still consider the cost of their education even if grants assist them in paying for it. These findings suggest that, while grant aid may improve access to higher education, the grants themselves do not necessarily ensure persistence or reduce the impact of costs.

Non-tuition expenses. Non-tuition expenses are unique among the financial variables. Most students, even ones for whom finances did not significantly affect the college choice process, are cognizant of their tuition level and aid package prior to enrollment. Non-tuition expenses, however, may be less transparent to students when they enroll. While prior nexus studies have examined non-tuition expenses as "controllable," this distinction is probably less important than the fact that these expenses are more difficult to predict due to the sundry expenses which fall into this category and the number of unexpected events which may occur throughout a student's education.

It follows that non-tuition expenses are related to college experience to a degree that the others may not be. The others, arguably, are more closely related to college choice. It may be the case that tuition, grants, and loans, which are easier to quantify during the college search process, have more direct influence on college choice than on persistence or completion (accounting for confounds). This would explain why non-tuition expense was the only financial variable to have a significant main effect on persistence to attainment at for-profit institutions. However, non-tuition expenses were

involved in significant nexus interactions only in the four-year non-profit sample, which may be an association with high living expenses associated with students at expensive institutions.

Loans. Loans had significant main effects only in the four-year non-profit sample and in the loan nexus model for two-year non-profits (both negative associations). However, the loan nexus interaction was significant in less-than-two-year and two-year for-profit institutions. The nature of the interaction for these two institution levels was similar: Loans are positively associated with persistence for FICC-negative students and negatively associated with persistence for FICC-affirmative students. The primary difference between these nexus effects is that in the less-than-two-year model, FICC-affirmative have lower predicted probabilities of completion regardless of loan level.

Loans, like tuition and grants, may have more of a direct effect on choice and access, but they may not significantly impact persistence to completion. However, the negative association with persistence for FICC-affirmative students is consistent with the evaluation of experiences against expectations described by nexus theory. Students who choose an institution based on finances (FICC-affirmative), yet also procure loans to enroll in programs lasting two years or less, may have expectations based heavily on whether their experience is worth its cost. Given the duration of these programs, the moderating effect of expectations over and above the expected cost response may not reflect unexpected financial burden, but rather the perceived value of the education for which the student is going into debt.

Scope of nexus theory. The nexus between college choice and persistence theoretically applies to academic, social, or financial aspects that students consider when

choosing a college and then re-consider once enrolled. However, if some financial variables in the current study reflect other institutional influences, then significant nexus interactions may indicate a relationship between choice- and persistence-related factors which are not necessarily within the same domain. For example, an ostensible interaction between financial impact on college choice and academic integration would still fall into the scope of nexus theory.

Nexus literature has exclusively examined the financial domain of the choice-persistence nexus but has suggested ways that the social and academic influences could be examined in future studies (St. John et al., 1996). While past studies examined these domains as parallel influences, the literature has described them as different facets of the same process. Paulsen and St. John noted that "students make ongoing judgments about whether their academic and social experiences are worth the price they must pay, not only in tuition and living costs but also in time required for work" (1997, p. 68). These ongoing judgments suggest a non-linear, subjective cost-benefit analysis involving all three domains. It is not necessarily the case, then, that academic experiences are compared only to academic expectations while financial experiences are compared only to financial expectations. With this in mind, the choice-persistence nexus may be most beneficial for explaining student persistence if reframed in a way that it has not been examined before.

EXAMINING NEXUS THEORY THROUGH ORGANIZATIONAL THEORY

Although student persistence research has principally used social-psychological and economic models, elements of organizational theory may help explain aspects of student retention and student satisfaction. In particular, elements of Herzberg's two-

factor theory may explain findings of this study that do not appear consistent with nexus theory. Elements of this framework suggest plausible explanations for some of the counterintuitive observations, such as the fact that financial impact on college choice shows no direct association with persistence and that interactions involving costs and aid do not predict persistence in an expected manner.

Herzberg's formulation of two-factor theory originally examined motivation to succeed in workplace settings (Herzberg, Mausner, & Snyderman, 1959). The theory asserted that causes of worker satisfaction and causes of worker dissatisfaction were completely distinct elements. That is, eliminating causes of dissatisfaction is not sufficient to create satisfaction, and vice versa. The two are not opposite ends of the same scale, but phenomena that occur on different planes. Dissatisfaction is largely driven by poor working conditions, low pay, or demanding hours. Satisfaction, by contrast, is driven by a sense of purpose in one's work, opportunities for advancement, and achieving important goals. The former category is *hygiene*, the latter is *motivation*. Addressing threats to hygiene may improve organizational function but cannot directly affect motivation.

Herzberg's original theory has been examined in literature extensively (Stello, 2011). Critics have pointed out flaws in Herzberg's methodology, and attempts to replicate Herzberg's findings have not always supported the original study (Bockman, 1971; French, Metersky, Thaler, & Trexler, 1973; Gordon, Pryor, & Harris, 1974; Farr, 1977; Gardner, 1977; Bellott & Tutor, 1990). In addition to potential validity and reliability issues with Herzberg's instrument, for example, the described categories of satisfaction and dissatisfaction are not necessarily determinants of worker productivity.

However, more recent research has found support for the basic framework of Herzberg's theory, in spite of the criticisms of his original methodology (Gawel, 1997; Bassett-Jones & Lloyd, 2005; Sachau, 2007; Eveleth, Liesz, Pettit-O'Malley, Rounds, & Xu, 2011). The concepts of satisfaction and motivation may apply to higher education in ways similar to how Herzberg used them to describe relationships between employers and employees. Two-factor theory may thus have useful application in persistence research.

At least one recent study has used expansions of Herzberg's two-factor theory as a framework to explain student retention and persistence, as many determinants of student satisfaction and motivation to persist parallel those of workplace employees' satisfaction and loyalty to an employer. DeShields, Kara, and Kaynak asserted that "faculty performance and classes are directly related to the outcome from a college experience and may be considered motivators or satisfiers (e.g. growth and achievement)" (2005, p. 132). They found that these motivators had significant influence on persistence. Though research in this area is limited, Herzberg's theory, when applied to higher education, would suggest that motivating factors similar to the ones DeShields et al. examined (e.g. a student's program of study, opportunities to engage with faculty) are more important to student persistence than hygiene -related influences like available facilities, amenities, or—to an extent—even finances.

According to Herzberg's original conception, an employee's pay falls squarely into the "hygiene" category. Raising employees' wages may eliminate dissatisfaction but does not instill motivation into otherwise unfulfilling work. Similarly, it may be that favorable educational costs and aid reduce student dissatisfaction but are not motivating factors and therefore do not increase satisfaction. However, though motivating factors

are hypothesized to be important factors in persistence, and though finances are hypothesized not to be motivating factors, this does not suggest that cost and aid have no impact on persistence. This may simply mean that other factors are in play or that other factors may take precedence.

Applying Herzberg's two-factor to the overarching process of college choice and student persistence reveals a possible link to nexus theory. The distinction between hygiene and motivation factors may have an important connection to the distinction between college choice factors and persistence factors. Richard James (2002), in an examination of the consequences of mismatches between student expectations and experiences, articulates what may be a theoretical bridge:

> The motivational factors associated with higher education are generally unobservable for outsiders and can only be understood through sustained involvement. As a consequence, student expectations [when they begin college] probably lie closest to hygiene factors. During the process of choice of a course and university, prospective students are known to find it easier to make decisions on course/institution characteristics that lean towards hygiene factors—readily observable, tangible qualities…. However, they have limited access to the less tangible course features that are likely to provide motivation. The less observable dimensions of the university experience are those which capture the imagination and spur a continuing commitment, and which are the key to persistence and success at university…. (p. 78)

Borrowing elements from two-factor and nexus theory to re-word James' assertion, a plausible hybrid between the two emerges: Hygiene factors are ostensibly the primary

consideration in college choice because this type of information is more readily available to potential students. Motivation factors are largely unknown until after students matriculate, but may have greater impact on persistence decisions. Theoretically, then, students evaluate their college experience according to different criteria (motivation) than the ones on which they based their expectations (hygiene). However, this does not preclude the possibilities that students nevertheless perceive an implicit contract with the university and that they still weigh their experiences against their expectations.

Intersection between two-factor and nexus theories. A combined theoretical model using both two-factor and nexus theory may better explain the college choice-persistence relationship better than either model in isolation. Results of the current study, considered in light of past studies, provide several indications that elements of both theories play a role in students' decision processes. Three basic assumptions would describe this hybrid theory:

First, the perceived implicit contract described by nexus theory is a valid construct. The process by which students form expectations and then re-evaluate those expectations in light of experiences is supported by the study's findings of significant, moderating relationships between college choice variables and college experience variables (though the lack of main effects suggests financial experience variables reflect other influences). The interaction between these elements does provide evidence that dissonance between expectations and experience—a perceived violation of the implicit contract—is associated with leaving an institution.

Second, based on limited research (James, 2002; DeShields et al., 2005), factors which influence college choice and which influence student satisfaction predominantly

fall into the categories of *hygiene* factors and *motivation* factors, respectively. Extrinsic factors like cost, aid, facilities, and program offerings are the primary drivers of college choice because they are transparent to an outsider. However, intrinsic factors like quality of instruction, value of student support, and other academic and social integration factors are the primary determinants of student satisfaction. Student satisfaction may influence persistence, suggesting there is an association between motivating factors and decisions to persist or leave.

Third, linking the first two assumptions, hygiene and motivation factors interact within the college student decision process in a manner that likely would not occur in a workplace situation due to their temporal relationship in higher education. This temporal relationship dictates the way students interpret them. Based on the theoretical comparison of expectations and experiences, and based on the factors which ostensibly drive each, the implicit contract is established by hygiene factors and re-evaluated based on motivation factors. Put another way, the implicit contract is considered inviolate when students' experiences, which are based on motivation factors, are consistent with their expectations, which are based on hygiene factors.

FUTURE RESEARCH

Based on the above assumptions, several implications warrant examination in a future study to determine the validity of this link between two-factor and nexus theories.

One, college choice is principally impacted by hygiene factors. These factors would not necessarily be predicted to have a direct influence on persistence. This first implication is based on two-factor theory and supported by the findings of the current

study that financial impact on college choice is not significantly associated with persistence as nexus theory asserted.

Two, persistence to attainment is principally impacted by motivation factors. This second implication is based on two-factor theory and supported by student persistence studies which have examined the effects of factors which would fit the description of "motivators" (DeShields et al., 2005). Though the findings of the current study briefly address main effects between experience variables and persistence to attainment, nexus theory makes no explicit claims about direct influences of experience-related variables.

Three, extending the theoretical bridge, hygiene factors moderate the relationship between motivation factors and student persistence. This implication is based on findings from the current study of significant interactions between choice and experience variables, as nexus theory predicts, but that the counterintuitive nature of these interactions is not sufficiently explained by nexus theory. The significance of the nexus interactions is interpreted as financial impact on college choice having a moderating effect on the relationship between latent institutional or student factors and student persistence.

A study examining these implications would benefit from several modifications to nexus methodology. While the dichotomous dependent variable used for this study is easy to interpret, future studies may explore this outcome further by distinguishing between those students who earned their credential (perhaps in a given time frame, like 150%) and those students who have persisted but not yet completed aa program. If possible, it would be beneficial to use a variable better suited to measure student expectations than FICC. Even if a more direct measure is not possible, a more granular

variable or variables, such as those used in past nexus studies, would be an improvement. Also, it is necessary to examine student experience variables more closely. While the academic and social indexes reflect student experiences, measures of student evaluations of their experiences, such as course evaluations, would provide even greater benefit. Future examinations of nexus influences on persistence may benefit from utilizing a multi-level model to examine the student background level and institution level variables. The degree to which socioeconomic status, ethnicity, and academic preparation appear to have varying effects at different institutions and sectors suggests that examining them in a nested arrangement may improve the explanatory power of the model. Additionally, the model may benefit from inclusion of variables like selectivity (e.g. high school GPA of prior year's accepted class) or retention climate (e.g. presence of initiatives to improve persistence, like first-year experiences). These are hypothesized to confound the relationship between some of the financial variables and student persistence.

In terms of examining interactions between factors, future studies may produce better fitting models by reclassifying variables according to whether they are predominantly hygiene factors or motivator factors, and whether their impact becomes salient during the college choice process or only during the college experience, as this may indicate whether they affect choice, persistence, or both—either directly or indirectly. While the hygiene/motivator and choice/persistence distinctions are predicted to align closely, exceptions are possible. For example, non-tuition expenses may be post-matriculation influences on persistence while the other financial variables impact college choice. Yet all these financial variables would be likely be considered hygiene factors, which would make non-tuition expenses a unique hygiene factor/college experience

variable (the fact that non-tuition expenses showed significant main effects but created no significant nexus interactions in any for-profit model would be consistent with the hypothesis, though not directly supporting it, that nexus interactions occur between hygiene choice factors and motivator experience factors).

The degree to which the nexus and two-factor theoretical frameworks distinguish between variable types would be important points to examine in future research. It may be that different categorical combinations affect student decisions differently. To the extent that cost or financial issues compel students to drop out or stop out, it may be more accurate to conceptualize these as post-matriculation obstacles to access than actual influences on persistence decisions. As future research examines complex influences and interactions between types of factors, as well as the timing of those factors, it may help, from a theoretical standpoint, to describe students' synthesis of all these influences as a variable itself which in turn affects their decisions to persist or leave.

It may be simplest to think of a student's overall perception of their relationship with the institution as a single measure V, which may be interpreted as the net result of a subjective cost-benefit analysis about the value of the ongoing educational experience. This measure is related to economic models of value, where a consumer's valuation of a good or service is roughly the maximum cost worth paying to obtain it. V is related to a comparison of the net benefits like academic quality of instruction, potential future earnings, and potential social opportunities, as well as ongoing time cost, demands of work, frustrations over classes or administration, and, of course, financial burdens. Generally speaking, the factors which influence V most are expected to be what Herzberg would call motivators. However, extremely negative influences from hygiene factors

conceivably could trump positive motivator factors, regardless of whether that setting is an employer or a school. *V* is ultimately the final evaluation of whether the endeavor is worth further investment, based on all factors. If *V* drops below a certain threshold, then the student may choose not to persist. In nexus terms, student expectations inform predictions of *V.* This means that students may in fact be making predictions about the intrinsic motivational factors they expect to experience, based largely on extrinsic hygeine-related factors. Those predictions may affect (moderate) how the actual costs and benefits are evaluated in the student's estimation of *V* or, conceivably, how *V* impacts decisions to persist or leave.

The purpose of using an overarching construct like *V* instead of conceptualizing the process as variables directly impacting persistence (e.g. direct influence of social integration on decision to persist), is that recent literature suggests that different students may have very different motivations for attending college, and that these differences can have significant effects on whether students persist to completion (Guiffrida, Lynch, Wall, & Abel, 2013). In this manner, all students would estimate *V*, which affects persistence, but the relationships between various background and college influences affect *V* differently for different populations. Though Herzberg's classification of motivators may be the most influential on *V,* the relative importance of different motivating factors may vary by individual. Further, if students are in fact choosing schools based on expectations about very different factors, then the potential interaction effect between predictions (expectations) and experiences may be more complicated than any prior student persistence model has considered. It would make sense that these different motivating factors are in play in choosing different types of institutions, and

some of these underlying differences may be responsible for the observed distinctions between for-profit and non-profit institution persistence in the current study.

From a policy standpoint, the results of this study suggest that lowering costs and increasing aid may increase access to higher education at for-profit schools, but these steps do not necessarily contribute to student persistence and completion—at least, not for all student populations. Lower tuition, higher grants, and higher loan levels are associated with lower predicted probabilities of success for students attending for-profit schools whose college choice was impacted by finances (FICC-affirmative). This suggests that increasing access to aid to this population, who ostensibly are in greatest need, may not directly contribute to student success.

Given the findings of this study and prior ones regarding the influence that student expectations may have, it is recommended that future research examine the process through which students form their expectations and the role institutions have in this process. To the extent that dissonance between expectations and experiences are a result of miscommunication, it is worth examining whether improved communication or different marketing strategies may have positive effects on overall student persistence and success (Moogan, 2011). It is conceivable that effective pre-matriculation communication could improve an institution's persistence and completion rates despite lowering its volume of incoming students. Though students may not be able to judge their overall program until some time after enrolling, it may be possible to enable them to make better decisions at the outset and increase their likelihood of success if they have access to crucial information about the program they are entering.

Also, institutions may benefit from identifying and preemptively addressing misconceptions students have about their experience. As opposed to misunderstandings about program structure or campus community, some students have inaccurate or unreasonable expectations regarding the college experience—misconceptions which may have no connection whatsoever to the specific institution they selected. In such situations, communication prior to enrollment may not be sufficient, but these expectations may need to be confronted early in the college process and, in some cases, challenged (James, 2002). Neither institutions nor students are universally responsible for mismatches between student expectations and the reality of their college experiences. Therefore, an examination of institutional and student influences on the formation of expectations would be highly valuable to understanding the choice-persistence process.

CONCLUSION

The aim of this study was to shed light on how student expectations and experiences are connected to financial issues that face students attending for-profit schools. However, the findings of this study have created more questions for future research than conclusions to inform practice. Limitations of the data and potential confounds observed in the analysis suggest ways to improve future research into persistence at for-profit and other schools, but these issues also mean that specific findings may not be generalized to other populations. Though college choice, persistence, and completion are interrelated processes, the findings of this study suggest that the relationships between them and the factors which influence them are quite complex. The institutional sections to which these factors connect are also numerous. A

unifying, institution-wide strategy for student retention and success may require involvement of every faculty and staff member.

From a broader perspective, students from all backgrounds place a great deal of trust in the institutions in which they enroll. They expect to learn, they expect to receive support, and they expect to have opportunities to succeed. The findings of this study and prior nexus research echo anecdotes about students who feel their trust was misplaced. And while purposeful exploitation of this trust may be uncommon, miscommunication, mismatches between visions, and insufficient institutional support can produce similarly negative results. Higher education requires significant investment of time, effort, and finances—capital which traditionally disadvantaged may have a more difficult time affording. And while this is true at any institution of higher education, those disadvantaged populations disproportionately attend schools being scrutinized for their profit motive even while they offer access to students who may not otherwise have an opportunity. The cost of higher education impacts disadvantaged populations disproportionately, and for-profit institutions endure questions about program quality perhaps more than their non-profit counterparts. However, issues of cost, aid, and implicit contracts between students and institutions are concerns for all students in all sectors of higher education.

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APPENDIX A: TABLES OF DESCRIPTIVE STATISTICS AND LOGISTIC REGRESSION RESULTS

Table A.1

Weighted Descriptive Characteristics for Study Sample Students at For-Profit Schools, Stratified by Institution Level 2354)

Institution Level	Less-than two-year (n = 946)	Two-year (n = 441)	Four-year (n = 338)
	M (SD)	*M* (*SD*)	*M* (*SD*)
Age (as of 12/31/2003)	24.93 (8.46)	24.00 (7.70)	24.34 (8.61)
Social integration	n/a	10.72 (26.44)	11.76 (30.26)
Academic integration	n/a	55.46 (47.38)	57.88 (44.07)
Financial			
Grants	3059.90 (1970.51)	2926.89 (3112.13)	3203.73 (3428.20)
Loans	3868.90 (3560.40)	6517.03 (5445.92)	7119.16 (6280.68)
Tuition	7820.34 (3250.03)	8854.45 (4730.95)	9103.26 (4959.32)
Non-tuition expenses	7395.29 (2881.05)	7340.41 (3419.26)	7858.09 (3664.93)
	% (*n*)	% (*n*)	% (*n*)
Gender			
Male	23.14 (218.91)	47.83 (210.94)	41.00 (138.58)
Female	76.86 (727.09)	52.17 (230.06)	59.00 (199.42)
Race			

Black	30.09 (284.64)	22.63 (99.79)	21.75 (73.50)
Hispanic	33.79 (319.64)	19.96 (88.00	21.66 (73.21)
Asian	1.19 (11.29)	1.92 (8.45)	2.57 (8.69)
Other	4.42 (41.86)	4.11 (18.10)	9.54 (32.25)
White	30.50 (288.57)	51.39 (226.65)	44.48 (150.34)
Mother's education			
No high school diploma	31.12 (294.43)	18.19 (80.22)	14.29 (48.29)
High school diploma	44.19 (417.75)	51.02 (225.00)	43.51 (147.06)
Some college	8.20 (77.537)	12.32 (54.31)	14.88 (50.29)
Associate's degree	6.91 (65.40)	9.85 (43.45)	13.85 (46.81)
Bachelor's degree	6.80 (64.34)	6.48 (28.59)	10.59 (35.78)
Graduate degree	2.78 (26.32)	2.14 (9.44)	2.88 (9.75)
Income/Poverty Ratio			
Quintile 1 (lowest)	52.12 (493.02)	40.08 (176.74)	30.39 (102.71)
Quintile 2	35.14 (332.38)	30.94 (136.46)	31.42 (106.19)
Quintile 3	8.12 (76.85)	14.07 (62.06)	18.68 (63.14)
Quintile 4	2.31 (21.89)	6.30 (27.79)	9.86 (33.34)
Quintile 5 (highest)	2.31 (21.84)	8.60 (37.94)	9.65 (32.63)
Dependency			
Dependent	37.37 (353.48)	42.81 (188.80)	51.65 (174.57)
Independent	62.63 (592.52)	57.19 (252.20)	48.35 (163.43)
Marital status			
Married	16.07 (151.98)	13.83 (61.00)	13.27 (44.84)
Single	83.93 (793.98)	86.17 (380.00)	86.73 (293.16)
High School Diploma			
Yes	69.77 (660.04)	75.85 (334.49)	84.61 (285.99)

	No	30.23 (285.96)	24.15 (106.51)	15.39 (52.01)
Aspirations				
	Certificate	30.59 (289.37)	14.49 (63.89)	0.12 (0.39)
	Associate's degree	13.26 (125.44)	23.15 (102.09)	9.69 (32.75)
	Bachelor's degree	32.98 (311.99)	36.04 (158.94)	38.49 (130.09)
	Graduate degree	23.17 (219.22)	26.32 (116.09)	51.70 (174.76)
Financial impact on college choice				
	Yes	34.25 (324.00)	32.17 (141.89)	26.55 (89.75)
	No	65.75 (622.00)	67.83 (299.11)	73.45 (248.25)
Attendance				
	Full time	87.96 (832.10)	90.39 (398.60)	80.40 (271.76)
	Part time	12.04 (113.90)	9.61 (42.40)	19.60 (66.24)
Employment				
	Full time job	23.39 (221.24)	31.46 (138.72)	44.25 (149.55)
	Part time job	32.54 (307.87)	36.77 (162.16)	33.43 (113.00)
	No job	44.07 (416.90)	31.77 (140.11)	22.32 (75.44)
Program				
	Certificate	98.50 (931.80)	31.16 (137.44)	1.28 (4.34)
	Associate's	0.74 (7.00)	67.63 (298.25)	52.66 (177.99)
	Bachelor's	0.76 (7.16)	1.21 (5.34)	46.06 (155.67)
Persistence				
	Persisted	53.25 (503.77)	38.17 (168.32)	31.33 (105.90)
	Left	46.75 (442.23)	61.83 (272.68)	68.67 (232.10)

Table A.2

Weighted Descriptive Statistics for two-year and four-year Institutions, Comparison of For-profit to Non-profit

Institution Level	Two-year		Four-year	
Institution Sector	For-profit (n = 441)	Non-profit (n = 4194)	For-profit (n = 338)	Non-profit (n = 7315)
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Age (as of 12/31/2003)	24.00 (7.70)	22.91 (8.30)	24.34 (8.61)	19.16 (4.09)
Social integration	10.72 (26.44)	17.00 (32.89)	11.76 (30.26)	63.99 (52.47)
Academic integration	55.46 (47.38)	55.78 (41.96)	57.88 (44.07)	88.15 (41.68)
Financial (units of $1,000)				
Grants	2926.89 (3112.13)	1151.46 (1892.16)	3203.73 (3428.20)	4878.16 (5947.76)
Loans	6517.03 (5445.92)	353.68 (1260.11)	7119.16 (6280.68)	3105.52 (5009.18)
Tuition	8854.45 (4730.95)	1372.86 (1505.75)	9103.26 (4959.32)	9414.80 (8289.25)
Non-tuition expenses	7340.41 (3419.26)	5428.88 (2713.06)	7858.09 (3664.93)	8960.85 (2678.22)
	% (*n*)	% (*n*)	% (*n*)	% (*n*)
Gender				
Male	47.83 (210.94)	42.78 (1794.26)	41.00 (138.58)	44.59 (3262.08)
Female	52.17 (230.06)	57.22 (2399.74)	59.00 (199.42)	55.41 (4052.92)
Race				

Black	22.63 (99.79)	14.75 (618.76)	21.75 (73.50)	9.47 (692.83)
Hispanic	19.96 (88.00	15.12 (634.14)	21.66 (73.21)	9.50 (695.10)
Asian	1.92 (8.45)	4.31 (180.96)	2.57 (8.69)	5.82 (425.47)
Other	4.11 (18.10)	4.97 (208.50)	9.54 (32.25)	4.93 (360.81)
White	51.39 (226.65)	60.84 (2551.64)	44.48 (150.34)	70.28 (5140.80)
Mother's education				
No high school diploma	18.19 (80.22)	12.77 (535.54)	14.29 (48.29)	4.86 (355.75)
High school diploma	51.02 (225.00)	43.04 (1805.10)	43.51 (147.06)	28.56 (2089.16)
Some college	12.32 (54.31)	11.46 (480.56)	14.88 (50.29)	11.63 (850.63)
Associate's degree	9.85 (43.45)	14.81 (621.28)	13.85 (46.81)	12.33 (902.30)
Bachelor's degree	6.48 (28.59)	11.86 (497.24)	10.59 (35.78)	26.78 (1959.23)
Graduate degree	2.14 (9.44)	6.06 (254.27)	2.88 (9.75)	15.84 (1158.93)
SES				
Quintile 1 (lowest)	40.08 (176.74)	21.21 (889.56)	30.39 (102.71)	10.47 (765.79)
Qunitile 2	30.94 (136.46)	22.06 (925.25)	31.42 (106.19)	15.48 (1132.00)
Quintile 3	14.07 (62.06)	19.36 (811.93)	18.68 (63.14)	17.34 (1268.60)
Quintile 4	6.30 (27.79)	15.37 (644.80)	9.86 (33.34)	15.64 (1144.01)
Quintile 5 (highest)	8.60 (37.94)	21.99 (922.46)	9.65 (32.63)	41.07 (3004.60)
Dependency				
Dependent	42.81 (188.80)	65.89 (2763.57)	51.65 (174.57)	93.24 (6820.66)
Independent	57.19 (252.20)	34.11 (1430.43)	48.35 (163.43)	6.76 (494.34)
Marital status				
Married	13.83 (61.00)	15.06 (631.45)	13.27 (44.84)	2.44 (178.79)
Single	86.17 (380.00)	84.94 (3562.55)	86.73 (293.16)	97.56 (7136.21)
High School Diploma				
Yes	75.85 (334.49)	86.73 (3637.58)	84.61 (285.99)	95.64 (6996.08)

No	24.15 (106.51)	13.27 (556.42)	15.39 (52.01)	4.36 (318.92)
Aspirations				
Certificate	14.49 (63.89)	0.00 (0)	0.12 (0.39)	0.00 (0)
Associate's degree	23.15 (102.09)	15.84 (664.33)	9.69 (32.75)	0.66 (48.28)
Bachelor's degree	36.04 (158.94)	39.29 (1647.90)	38.49 (130.09)	23.84 (1744.07)
Graduate degree	26.32 (116.09)	44.87 (1881.98)	51.70 (174.76)	75.50 (5523.18)
Financial impact on college choice				
Yes	32.17 (141.89)	69.52 (2915.87)	26.55 (89.75)	54.11 (3958.21)
No	67.83 (299.11)	30.48 (1278.13)	73.45 (248.25)	45.89 (3356.79)
Attendance				
Full time	90.39 (398.60)	52.89 (2218.32)	80.40 (271.76)	93.60 (6847.18)
Part time	9.61 (42.40)	47.11 (1975.68)	19.60 (66.24)	6.40 (467.82)
Employment				
Full time job	31.46 (138.72)	29.63 (1242.48)	44.25 (149.55)	7.66 (560.22)
Part time job	36.77 (162.16)	46.21 (1938.02)	33.43 (113.00)	40.17 (2938.66)
No job	31.77 (140.11)	24.16 (1013.27)	22.32 (75.44)	52.17 (3816.24)
Program				
Certificate	31.16 (137.44)	0.00 (0)	1.28 (4.34)	0.00 (0)
Associate's	67.63 (298.25)	95.62 (4010.43)	52.66 (177.99)	2.25 (164.76)
Bachelor's	1.21 (5.34)	4.38 (330.72)	46.06 (155.67)	97.75 (7150.24)
Sector				
For-profit	100.00 (441)	n/a	100.00 (338)	n/a
Public non-profit	n/a	99.85 (4187.76)	n/a	66.24 (4845.73)
Private non-profit	n/a	0.15 (6.24)	n/a	33.76 (2469.27)

Persistence				
Persisted	38.17 (168.32)	30.96 (1298.38)	31.33 (105.90)	63.04 (4611.07)
Left	61.83 (272.68)	69.04 (2895.62)	68.67 (232.10)	36.96 (2703.93)

Table A.3

Logistic Regression Results for Less-than-two-year For-profit Institutions

Model	FP1A			FP2A			FP3A			FP4A			FP5A		
	Est.		*SE*	Est.		*SE*	Est.		*SE*	Est.		*SE*	Est.		*SE*
Intercept	0.20		0.64	0.20		0.65	0.20		0.64	0.11		0.63	0.20		0.64
Male	-0.46	*	0.20	-0.46	*	0.20	-0.45	*	0.20	-0.48	*	0.20	-0.47	*	0.20
Age	0.01		0.02	0.01		0.02	0.01		0.02	0.01		0.01	0.01		0.02
Race															
Black	0.15		0.30	0.14		0.30	0.17		0.29	0.18		0.31	0.14		0.30
Hispanic	0.77	**	0.29	0.77	**	0.29	0.79	**	0.29	0.79	**	0.28	0.77	**	0.28
Asian	-0.41		0.68	-0.40		0.67	-0.42		0.68	-0.28		0.68	-0.41		0.68
Other	-0.53		0.61	-0.53		0.61	-0.53		0.61	-0.52		0.62	-0.53		0.61
Mother's education															
No high school diploma	0.07		0.23	0.07		0.23	0.07		0.23	0.07		0.23	0.08		0.23
Some college	-0.08		0.38	-0.08		0.38	-0.03		0.38	-0.13		0.38	-0.07		0.39
Associate's degree	0.22		0.35	0.22		0.35	0.20		0.36	0.10		0.37	0.21		0.35
Bachelor's degree	0.03		0.39	0.04		0.39	0.06		0.39	0.16		0.38	0.04		0.40
Graduate degree	1.83	**	0.42	1.82	**	0.42	1.86	**	0.43	1.88	**	0.43	1.83	**	0.41
Income/poverty ratio															
Low	-1.13	*	0.55	-1.13	*	0.55	-1.17	*	0.57	-1.09	*	0.55	-1.14	*	0.55
Low-middle	-0.96		0.52	-0.96		0.52	-1.00		0.53	-0.92		0.52	-0.96		0.52
High-middle	-2.00	*	0.98	-2.01	*	0.98	-2.07	*	1.03	-2.05	*	1.02	-2.02	*	0.97
High	-2.70	**	0.86	-2.70	**	0.86	-2.74	**	0.85	-2.67	**	0.85	-2.71	**	0.84
Dependent	1.08	**	0.36	1.08	**	0.36	1.07	**	0.37	1.05	**	0.36	1.08	**	0.36

Married	0.22		0.31	0.22		0.31	0.23		0.32	0.15		0.31	0.23		0.31
No high school diploma	0.34		0.25	0.34		0.25	0.35		0.25	0.30		0.25	0.34		0.25
Aspirations															
Certificate	0.33		0.32	0.34		0.32	0.34		0.32	0.38		0.33	0.33		0.32
Bachelor's degree	0.21		0.28	0.21		0.28	0.24		0.27	0.23		0.28	0.21		0.28
Graduate degree	-0.53		0.27	-0.53		0.27	-0.51		0.27	-0.50		0.27	-0.53		0.27
FICC	-0.06		0.24	-0.06		0.24	-0.06		0.24	-0.05		0.24	-0.06		0.24
Full-time attendance	0.36		0.47	0.36		0.47	0.36		0.47	0.43		0.47	0.36		0.47
Full-time job	-0.14		0.24	-0.14		0.23	-0.15		0.23	-0.12		0.23	-0.14		0.24
Part-time job	-0.47	*	0.24	-0.47	*	0.23	-0.46		0.24	-0.44		0.24	-0.47	*	0.24
GPA	0.00	*	0.00	0.00	*	0.00	0.00	*	0.00	0.00	**	0.00	0.00	*	0.00
Nontuition expenses	0.15	**	0.04	0.15	**	0.04	0.17	**	0.06	0.15	**	0.04	0.15	**	0.04
Tuition	0.01		0.04	0.01		0.05	0.01		0.04	0.01		0.04	0.01		0.04
Loans	0.01		0.04	0.01		0.04	0.01		0.04	0.07		0.04	0.01		0.04
Grants	0.01		0.06	0.01		0.06	0.01		0.06	-0.01		0.06	0.01		0.06
FICC*Tuition				0.01		0.07									
FICC*Nontuition							-0.06		0.09						
FICC*Loans										-0.17	**	0.05			
FICC*Grants													-0.01		0.13
-2LL (intercept only: 1307.428)	1117.267			1117.217			1116.029			1104.498			1117.238		
pseudo R^2	0.257			0.257			0.259			0.272			0.257		
Somer's *D*	0.281			0.282			0.282			0.285			0.281		

*$p < .05$; **p < .01

Model coding: 1 = base model, 2 = tuition nexus, 3 = nontuition nexus, 4 = loan nexus, 5 = grant nexus; A = LT2YR

Table A.4

Logistic Regression Results for Two-year For-profit Institutions

Model	FP1B			FP2B			FP3B			FP4B			FP5B		
	Est.		*SE*	Est.		*SE*	Est.		*SE*	Est.		*SE*	Est.		*SE*
Intercept	-1.89	**	0.59	-2.03	**	0.59	-1.88	**	0.58	-1.92	**	0.59	-1.90	**	0.58
Male	0.37		0.24	0.29		0.26	0.36		0.25	0.33		0.25	0.35		0.24
Age	-0.08		0.04	-0.08		0.04	-0.08		0.04	-0.08	**	0.04	-0.08		0.04
Race															
Black	0.03		0.30	0.08		0.31	0.03		0.31	0.05		0.30	-0.02		0.30
Hispanic	-0.16		0.37	-0.13		0.34	-0.17		0.37	-0.19		0.35	-0.19		0.35
Asian	2.41	*	1.11	2.71	*	1.16	2.44	**	1.10	2.44	**	1.09	2.39	*	1.09
Other	0.07		0.52	0.51		0.46	0.12		0.52	0.34		0.48	0.07		0.54
Mother's education															
No high school diploma	0.65		0.39	0.64		0.44	0.68		0.39	0.68		0.41	0.63		0.39
Some college	0.98	**	0.37	0.91	*	0.40	0.98	**	0.38	0.97	*	0.38	1.02	**	0.38
Associate's degree	0.33		0.45	0.29		0.47	0.31		0.45	0.33		0.46	0.30		0.46
Bachelor's degree	0.13		0.25	0.12		0.28	0.14		0.25	0.15		0.26	0.09		0.24
Graduate degree	-1.13		1.11	-1.20		1.07	-1.12		1.09	-1.09		1.02	-1.09		1.14
Income/poverty ratio															
Low	0.12		0.38	0.11		0.42	0.11		0.38	0.05		0.38	0.15		0.41
Low-middle	-0.02		0.36	-0.05		0.37	-0.01		0.37	-0.07		0.36	-0.02		0.37

High-middle	-0.50		0.53	-0.53		0.54	-0.48		0.52	-0.54		0.52	-0.50		0.53
High	1.41	**	0.28	1.35	**	0.30	1.38	**	0.28	1.31	**	0.28	1.34	**	0.27
Dependent	-0.23		0.30	-0.18		0.29	-0.24		0.31	-0.25		0.30	-0.20		0.30
Married	0.44	**	0.16	0.56	**	0.20	0.43	**	0.16	0.47	**	0.17	0.52	**	0.17
No high school diploma	0.81	*	0.35	0.78	*	0.37	0.81	**	0.35	0.81	*	0.36	0.73	*	0.34
Aspirations															
Bachelor's degree	-0.54		0.31	-0.54		0.31	-0.53		0.31	-0.55		0.32	-0.54		0.31
Graduate degree	0.18		0.31	0.30		0.32	0.20		0.33	0.25		0.33	0.17		0.31
FICC	0.53		0.31	0.49		0.32	0.52		0.31	0.49		0.32	0.52		0.31
Full-time attendance	0.61		0.51	0.68		0.51	0.60		0.51	0.67		0.51	0.59		0.50
Full-time job	-0.83	**	0.26	-0.83	**	0.26	-0.84	**	0.27	-0.78	**	0.25	-0.80	**	0.26
Part-time job	-0.55		0.33	-0.53		0.33	-0.55		0.32	-0.52		0.33	-0.50		0.33
Social integration index	-0.01		0.01	-0.01		0.01	-0.01		0.01	-0.01		0.01	-0.01		0.01
Academic integration index	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Certificate program	1.01	**	0.27	1.01	**	0.27	1.03	**	0.26	1.03	**	0.27	1.01	**	0.27
GPA	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00
Nontuition expenses	0.04		0.05	0.06		0.05	0.06		0.06	0.04		0.05	0.05		0.05
Tuition	0.03		0.02	0.08	**	0.02	0.03		0.02	0.04		0.02	0.03		0.03
Loans	0.04		0.03	0.04		0.03	0.04		0.03	0.07		0.04	0.04		0.03
Grants	0.01		0.05	0.00		0.06	0.01		0.05	0.01		0.05	0.05		0.06
FICC*Tuition				-0.16	*	0.07									
FICC*Nontuition							-0.06		0.07						
FICC*Loans										-0.10	*	0.05			
FICC*Grants													-0.12	†	0.06
-2LL (intercept only: 586.428)			452.423			445.853			451.905			448.916			450.216
pseudo R^2			0.363			0.378			0.364			0.371			0.368

Somer's *D*	0.513	0.521	0.512	0.510	0.515

†p < .1 (interaction terms only); *p < .05; **p < .01

Model coding: 1 = base model, 2 = tuition nexus, 3 = nontuition nexus, 4 = loan nexus, 5 = grant nexus; B = 2YR

Table A.5

Logistic Regression Results for Four-year For-profit Institutions

Model	FP1C		FP2C		FP3C		FP4C		FP5C		
	Est.	*SE*	Est.	*SE*	Est.	*SE*	Est.	*SE*	Est.		*SE*
Intercept	0.16	0.90	0.15	0.89	0.20	0.91	0.16	0.91	0.32		0.92
Male	-0.37	0.32	-0.43	0.34	-0.37	0.32	-0.37	0.33	-0.42		0.33
Age	-0.03	0.02	-0.03	0.02	-0.03	0.02	-0.03	0.02	-0.03		0.02
Race											
Black	-0.04	0.50	0.01	0.53	-0.05	0.51	-0.04	0.50	-0.02		0.50
Hispanic	-0.85	0.47	-0.77	0.46	-0.88	0.47	-0.85	0.47	-0.89		0.50
Asian	-0.50	0.71	-0.51	0.73	-0.52	0.72	-0.49	0.71	-0.41		0.74
Other	-0.02	0.65	-0.04	0.61	-0.02	0.65	-0.02	0.65	-0.02		0.67
Mother's education											
No high school diploma	0.80	0.53	0.80	0.52	0.81	0.53	0.80	0.54	0.76		0.52
Some college	-1.44	0.76	-1.44	0.75	-1.45	0.76	-1.45	0.77	-1.63	*	0.77
Associate's degree	0.14	0.32	0.13	0.31	0.16	0.31	0.14	0.32	0.20		0.32
Bachelor's degree	0.54	0.54	0.53	0.53	0.55	0.54	0.54	0.55	0.46		0.54
Graduate degree	-0.52	0.86	-0.52	0.89	-0.53	0.85	-0.53	0.89	-0.67		0.87
Income/poverty ratio											
Low	0.01	0.27	0.03	0.28	0.01	0.27	0.01	0.26	-0.01		0.29
Low-middle	0.33	0.30	0.35	0.31	0.33	0.31	0.34	0.31	0.29		0.29
High-middle	-0.21	0.78	-0.23	0.78	-0.21	0.78	-0.22	0.79	-0.26		0.76
High	0.51	0.53	0.57	0.57	0.51	0.54	0.52	0.53	0.48		0.55

Dependent	0.29		0.39	0.26		0.41	0.29		0.39	0.29		0.39	0.23		0.39
Married	-0.27		0.44	-0.30		0.39	-0.27		0.45	-0.27		0.44	-0.37		0.41
No high school diploma	0.46		0.38	0.51		0.37	0.43		0.37	0.46		0.38	0.29		0.38
Aspirations															
Bachelor's degree	-0.96		1.20	-0.98		1.22	-0.96		1.20	-0.96		1.21	-0.91		1.27
Graduate degree	-1.29		1.13	-1.31		1.15	-1.30		1.13	-1.29		1.14	-1.28		1.19
FICC	0.15		0.24	0.11		0.24	0.15		0.24	0.15		0.24	0.22		0.28
Full-time attendance	0.49		0.27	0.51		0.28	0.45		0.30	0.48		0.27	0.28		0.31
Full-time job	-0.19		0.44	-0.17		0.46	-0.18		0.44	-0.19		0.44	-0.11		0.49
Part-time job	-0.75		0.42	-0.77		0.42	-0.74		0.42	-0.75		0.42	-0.72		0.41
Social integration index	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.00		0.01
Academic integration index	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Bachelor's degree program	-0.06		0.56	-0.09		0.57	-0.05		0.56	-0.06		0.56	-0.06		0.56
GPA	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00
Nontuition expenses	0.14	*	0.06	0.14	*	0.06	0.10	*	0.06	0.14	*	0.06	0.14	**	0.05
Tuition	0.10		0.05	0.13	*	0.05	0.10		0.05	0.10		0.05	0.12	*	0.05
Loans	-0.01		0.02	-0.01		0.02	-0.01		0.03	-0.01		0.03	-0.01		0.03
Grants	-0.02		0.04	-0.03		0.04	-0.02		0.04	-0.02		0.04	-0.06		0.04
FICC*Tuition				-0.12	*	0.06									
FICC*Nontuition							0.03		0.06						
FICC*Loans										-0.01		0.05			
FICC*Grants													0.23		0.14
(intercept only: -2LL 420.28)			308.618			305.900			308.552			308.599			305.091
pseudo R^2			0.403			0.411			0.403			0.403			0.413
Somer's *D*			0.565			0.567			0.565			0.565			0.563

*$p < .05$; **p < .01

Model coding: 1 = base model, 2 = tuition nexus, 3 = nontuition nexus, 4 = loan nexus, 5 = grant nexus; C = 4YR

Table A.6

Logistic Regression Results for Two-Year Non-Profit Institutions

Model	NP1B			NP2B			NP3B			NP4B			NP5B		
	Est.		*SE*	Est.		*SE*	Est.		*SE*	Est.		*SE*	Est.		*SE*
Intercept	-0.13		0.30	-0.13		0.30	-0.13		0.29	-0.13		0.30	-0.13		0.30
Male	-0.22	*	0.09	-0.22	*	0.09	-0.22	*	0.09	-0.22	*	0.09	-0.22	*	0.09
Age	-0.02	*	0.01	-0.02	*	0.01	-0.02	*	0.01	-0.02	*	0.01	-0.02	*	0.01
Race															
Black	-0.13		0.17	-0.13		0.16	-0.13		0.16	-0.13		0.16	-0.13		0.17
Hispanic	-0.22		0.15	-0.22		0.15	-0.23		0.15	-0.22		0.15	-0.23		0.15
Asian	-0.27		0.24	-0.27		0.24	-0.26		0.24	-0.27		0.24	-0.28		0.24
Other	-0.14		0.16	-0.14		0.16	-0.14		0.16	-0.14		0.16	-0.14		0.16
Mother's education															
No HS diploma	-0.06		0.14	-0.06		0.14	-0.06		0.14	-0.06		0.14	-0.07		0.14
Some college	0.13		0.19	0.13		0.19	0.14		0.19	0.13		0.19	0.13		0.19
Associate's degree	-0.13		0.14	-0.13		0.14	-0.13		0.14	-0.13		0.14	-0.13		0.14
Bachelor's degree	0.10		0.17	0.10		0.17	0.10		0.17	0.10		0.17	0.09		0.17
Graduate degree	0.00		0.27	0.00		0.27	0.00		0.27	0.00		0.27	-0.01		0.27
Income/poverty ratio															
Low	-0.36	*	0.18	-0.36	*	0.18	-0.36		0.18	-0.36	*	0.18	-0.36	*	0.18
Low-middle	-0.14		0.16	-0.14		0.16	-0.14		0.16	-0.14		0.16	-0.14		0.16
High-middle	-0.16		0.16	-0.16		0.16	-0.16		0.16	-0.16		0.16	-0.16		0.16

High	-0.17		0.14	-0.17		0.14	-0.17		0.14	-0.17		0.14	-0.17		0.14
Dependent	0.07		0.19	0.08		0.19	0.08		0.19	0.08		0.19	0.07		0.19
Married	0.39	*	0.16	0.39	*	0.16	0.38	*	0.16	0.39	*	0.16	0.38	*	0.16
No high school diploma	-0.16		0.12	-0.16		0.13	-0.17		0.13	-0.17		0.13	-0.16		0.13
Aspirations															
Bachelor's degree	-0.40	**	0.15	-0.39	**	0.15	-0.40	**	0.15	-0.40	**	0.15	-0.39	**	0.15
Graduate degree	-0.32	*	0.15	-0.32	*	0.15	-0.32	*	0.15	-0.32	*	0.15	-0.31	*	0.15
FICC	0.01		0.12	0.01		0.12	0.01		0.12	0.01		0.12	0.01		0.12
Full-time attendance	0.08		0.11	0.08		0.11	0.08		0.11	0.08		0.11	0.08		0.11
Full-time job	-0.27		0.14	-0.27		0.14	-0.27		0.14	-0.27	*	0.14	-0.27		0.14
Part-time job	-0.20		0.11	-0.19		0.10	-0.20		0.10	-0.20		0.11	-0.20		0.10
Social integration index	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Academic integration index	0.00	*	0.00	0.00	*	0.00	0.00	*	0.00	0.00	*	0.00	0.00	*	0.00
GPA	0.00	**	0.00	0.00	**	0.00	0.00	**	0.00	0.00	**	0.00	0.00	**	0.00
Nontuition expenses	0.03		0.02	0.02		0.02	0.00		0.03	0.02		0.02	0.02		0.02
Tuition	-0.02		0.03	-0.05		0.04	-0.02		0.03	-0.01		0.04	-0.01		0.04
Loans	-0.05		0.03	-0.05		0.03	-0.05		0.03	-0.09	*	0.04	-0.05		0.03
Grants	0.04		0.03	0.04		0.03	0.04		0.03	0.04		0.03	-0.01		0.04
FICC*Tuition				0.05		0.05									
FICC*Nontuition							0.04		0.03						
FICC*Loans										0.06		0.06			
FICC*Grants													0.08	*	0.04
-2LL (intercept only: 5190.19)	4998.61			4997.34			4996.85			4997.66			4994.87		
pseudo	0.0638			0.0642			0.0643			0.0641			0.065		

R^2					
Somer's *D*	0.229	0.232	0.227	0.229	0.234

** $p < .01$; *$p < .05$; †(interaction terms only) $p < .1$

Model coding: 1 = base model, 2 = tuition nexus, 3 = nontuition nexus, 4 = loan nexus, 5 = grant nexus; B = 2YR

Table A.7

Logistic Regression Results for Four-year Non-profit Institutions

Model	NP1C		NP2C		NP3C		NP4C		NP5C	
	Est.	*SE*	Est.	*SE*	Est.	*SE*	Est.	*SE*	Est.	*SE*
Intercept	-0.30	0.49	-0.30	0.49	-0.29	0.49	-0.30	0.49	-0.30	0.49
Male	-0.06	0.07	-0.06	0.07	-0.06	0.07	-0.06	0.07	-0.06	0.07
Age	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02
Race										
Black	-0.11	0.13	-0.11	0.13	-0.11	0.13	-0.11	0.13	-0.11	0.13
Hispanic	-0.12	0.13	-0.12	0.13	-0.12	0.13	-0.12	0.13	-0.12	0.13
Asian	0.18	0.17	0.18	0.17	0.17	0.17	0.18	0.17	0.18	0.17
Other	-0.15	0.16	-0.15	0.16	-0.15	0.16	-0.15	0.16	-0.14	0.16
Mother's education										
No high school diploma	0.11	0.16	0.11	0.17	0.11	0.16	0.11	0.17	0.11	0.16
Some college	0.03	0.10	0.02	0.10	0.03	0.10	0.03	0.10	0.03	0.10
Associate's degree	-0.07	0.11	-0.07	0.11	-0.07	0.11	-0.07	0.11	-0.07	0.11
Bachelor's degree	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.09	0.09
Graduate degree	0.12	0.11	0.11	0.11	0.12	0.11	0.12	0.11	0.12	0.11
Income/poverty ratio										

Low	-0.41	**	0.12	-0.41	**	0.12	-0.41	**	0.12	-0.40	**	0.12	-0.40	**	0.12
Low-middle	-0.27	*	0.11	-0.28	*	0.11	-0.27	*	0.11	-0.27	*	0.11	-0.27	*	0.11
High-middle	-0.09		0.11	-0.09		0.11	-0.09		0.11	-0.09		0.11	-0.09		0.11
High	-0.01		0.11	0.00		0.11	-0.01		0.11	-0.01		0.11	-0.01		0.11
Dependent	0.97	*	0.23	0.96	**	0.23	0.97	**	0.23	0.97	**	0.23	0.97	**	0.23
Married	0.93	**	0.30	0.95	**	0.30	0.94	**	0.31	0.93	**	0.30	0.94	**	0.30
No high school diploma	-0.39	*	0.16	-0.38	*	0.16	-0.40	*	0.16	-0.39	*	0.16	-0.39	*	0.16
Aspirations															
Bachelor's degree	-0.04		0.45	-0.05		0.45	-0.05		0.44	-0.05		0.45	-0.05		0.45
Graduate degree	0.05		0.43	0.04		0.43	0.04		0.43	0.05		0.43	0.05		0.44
FICC	0.28	**	0.07	0.25	**	0.07	0.27	**	0.07	0.26	**	0.07	0.27	**	0.07
Full-time attendance	0.09		0.18	0.09		0.18	0.09		0.18	0.09		0.18	0.09		0.18
Full-time job	-0.48	**	0.16	-0.47	**	0.16	-0.48	**	0.16	-0.48	**	0.16	-0.47	**	0.16
Part-time job	-0.05		0.07	-0.05		0.07	-0.05		0.07	-0.05		0.07	-0.05		0.07
Social integration index	0.00	**	0.00	0.00	**	0.00	0.00	**	0.00	0.00	**	0.00	0.00	**	0.00
Academic integration index	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Private non-profit institution	-0.44	**	0.11	-0.44	**	0.11	-0.44	**	0.11	-0.44	**	0.11	-0.44	**	0.11
GPA	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00	0.01	**	0.00
Nontuition	0.06	**	0.01	0.06	**	0.01	0.09	**	0.02	0.06	**	0.01	0.06	**	0.01
Tuition	0.04	**	0.01	0.04	**	0.01	0.04	**	0.01	0.04	**	0.01	0.04	**	0.01
Loans	-0.02	**	0.01	-0.02	**	0.01	-0.02	**	0.01	-0.02	*	0.01	-0.02	**	0.01
Grants	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01	0.01		0.01

FICC*Tuition		-0.02 ** 0.01			
FICC*Nontuition			-0.05 † 0.03		
FICC*Loans				-0.01	0.01
FICC*Grants					-0.01 0.01
-2LL (intercept only: 9637.733)	8361.24	8353.53	8356.13	8359.45	8360.36
pseudo R^2	0.2198	0.221	0.2206	0.2201	0.22
Somer's *D*	0.464	0.466	0.463	0.464	0.464

** $p < .01$; *$p < .05$; †(interaction terms only) $p < .1$

Model coding: 1 = base model, 2 = tuition nexus, 3 = nontuition nexus, 4 = loan nexus, 5 = grant nexus; C = 4YR

Table A.8

Logistic Regression Results for Four-year Institutions, For-profit and Public Non-profit Sectors, Tuition Nexus

Model	2CCa-I			2CCa-II		
	Parameter		*SE*	Parameter		*SE*
Intercept	-0.40		0.32	-0.39		0.33
Male	0.02		0.09	0.02		0.09
Age	0.00		0.02	0.00		0.02
Race						
Black	-0.18		0.15	-0.17		0.16
Hispanic	-0.12		0.16	-0.10		0.17
Asian	0.29		0.22	0.29		0.22
Other	-0.24		0.20	-0.24		0.19
Mother's education						
No high school diploma	0.04		0.19	0.04		0.19
Some college	-0.26	*	0.12	-0.26	*	0.12
Associate's degree	-0.30	*	0.14	-0.30	*	0.14
Bachelor's degree	-0.11		0.12	-0.11		0.12
Graduate degree	-0.01		0.14	-0.01		0.14
Income/poverty ratio						
Low	-0.56	**	0.16	-0.57	**	0.16
Low-middle	-0.41	**	0.15	-0.42	**	0.15
High-middle	-0.10		0.14	-0.11		0.14
High	0.00		0.16	0.00		0.16

Dependent	0.84	**	0.26	0.84	**	0.26
Married	0.68		0.36	0.66		0.36
No high school diploma	-0.19		0.23	-0.19		0.23
Aspirations						
Bachelor's degree	-0.03		0.10	-0.04		0.10
FICC	0.29	**	0.10	0.30	**	0.09
Full-time attendance	0.21		0.20	0.22		0.20
Full-time job	-0.39	*	0.18	-0.39	*	0.18
Part-time job	-0.01		0.09	-0.01		0.09
Social integration index	0.00	*	0.00	0.00	**	0.00
Academic integration index	0.00		0.00	0.00		0.00
For-Profit School	-1.06	**	0.25	-1.35	**	0.25
GPA	0.01	**	0.00	0.01	**	0.00
Nontuition expenses	0.06	**	0.02	0.06	**	0.02
Tuition	0.02		0.02	0.01		0.02
Loans	-0.02	*	0.01	-0.02	*	0.01
Grants	0.02		0.01	0.02		0.01
FICC*Tuition	-0.03		0.02	-0.02		0.02
FICC*For-Profit School	0.25		0.30	0.78	**	0.26
Tuition*For-Profit School	0.06	**	0.02	0.12	**	0.04
FICC*Tuition*For-Profit School				-0.15	**	0.06
-2LL intercept only: 5500.70	4697.74			4692.81		
pseudo R^2	0.24			0.24		
Somer's *D*	0.46			0.46		

†$p < .1$ (interaction terms only); *$p < .05$; **$p < .01$

Model coding: 2 = tuition nexus model, CC = 4YR-NP/4YR-FP sample, a = Comparison using for-profit and *public* non-profit only, I = without 3-way interaction term, II = with 3-way interaction term

Table A.9

Logistic Regression Results for Four-year Institutions, For-profit and Private Non-profit Sectors, Tuition Nexus

Model	2CCb-I		2CCb-II	
	Parameter	*SE*	Parameter	*SE*
Intercept	0.74	0.44	0.77	0.44
Male	-0.08	0.10	-0.09	0.10
Age	-0.02	0.02	-0.02	0.02
Race				
Black	-0.31 *	0.15	-0.30 *	0.15
Hispanic	-0.23	0.16	-0.21	0.16
Asian	-0.16	0.20	-0.18	0.20
Other	-0.04	0.26	-0.06	0.26
Mother's education				
No high school diploma	0.19	0.28	0.18	0.29
Some college	0.13	0.18	0.14	0.18
Associate's degree	0.21	0.17	0.21	0.17
Bachelor's degree	0.45 **	0.15	0.44 **	0.15
Graduate degree	0.29 *	0.15	0.30 *	0.15
Income/poverty ratio				
Low	-0.36 *	0.16	-0.37 *	0.16
Low-middle	0.02	0.15	0.01	0.15
High-middle	-0.19	0.18	-0.20	0.18
High	-0.01	0.13	-0.01	0.13
Dependent	0.45	0.32	0.43	0.32

Married	1.33	**	0.47	1.30	**	0.47
No high school diploma	-0.45	*	0.20	-0.45	*	0.20
Aspirations						
Bachelor's degree	-0.27	*	0.12	-0.27	*	0.12
FICC	0.14		0.10	0.15		0.10
Full-time attendance	-0.63	*	0.26	-0.62	*	0.26
Full-time job	-0.49		0.30	-0.50		0.30
Part-time job	-0.13		0.11	-0.13		0.11
Social integration index	0.00		0.00	0.00		0.00
Academic integration index	0.00		0.00	0.00		0.00
For-Profit School	-0.20		0.31	0.03		0.41
GPA	0.01	**	0.00	0.01	**	0.00
Nontuition expenses	0.08	**	0.02	0.07	**	0.02
Tuition	0.06	**	0.01	0.06	**	0.01
Loans	-0.01		0.01	-0.01		0.01
Grants	0.01		0.01	0.00		0.01
FICC*Tuition	-0.03	*	0.01	-0.02	†	0.01
FICC*For-Profit School	0.07		0.35	-0.91		0.72
Tuition*For-Profit School	0.04	†	0.02	0.09	*	0.04
FICC*Tuition*For-Profit School				-0.13	*	0.06
-2LL						
intercept only: 4510.246	3585.88			3580.10		
pseudo R^2	0.33			0.33		
Somer's *D*	0.51			0.51		

†$p < .1$ (interaction terms only); *$p < .05$; **$p < .01$

Model coding: 2 = tuition nexus model, CC = 4YR-NP/4YR-FP sample, b = Comparison using for-profit and *private* non-profit only, I = without 3-way interaction term, II = with 3-way interaction term

Table A.10

Logistic Regression Results for Two-year Institutions, For-profit and Non-profit Sectors, Grant Nexus

Model	5BB-I		5BB-II	
	Estimate	*SE*	Estimate	*SE*
Intercept	-0.13	0.28	-0.14	0.28
Male	-0.17	0.09	-0.18 *	0.09
Age	-0.03 **	0.01	-0.03 **	0.01
Race				
Black	-0.12	0.15	-0.12	0.15
Hispanic	-0.20	0.14	-0.21	0.14
Asian	-0.41	0.24	-0.41	0.24
Other	-0.23	0.16	-0.22	0.16
Mother's education				
No high school diploma	0.03	0.13	0.01	0.13
Some college	0.11	0.19	0.11	0.19
Associate's degree	-0.14	0.14	-0.15	0.14
Bachelor's degree	0.08	0.16	0.08	0.16
Graduate degree	-0.09	0.29	-0.09	0.29
Income/poverty ratio				
Low	-0.34	0.17	-0.32	0.17
Low-middle	-0.14	0.15	-0.14	0.15
High-middle	-0.16	0.16	-0.16	0.16
High	-0.10	0.14	-0.10	0.14
Dependent	0.04	0.18	0.04	0.18
Married	0.31 *	0.15	0.31 *	0.15

No high school diploma	-0.07		0.12	-0.09		0.12
Aspirations						
Bachelor's degree	-0.35	*	0.14	-0.35	*	0.14
Graduate degree	-0.22		0.14	-0.22		0.14
FICC	-0.01		0.12	-0.01		0.12
Full-time attendance	0.02		0.11	0.03		0.11
Full-time job	-0.25		0.13	-0.25		0.13
Part-time job	-0.14		0.11	-0.14		0.11
Social integration index	0.00		0.00	0.00		0.00
Academic integration index	0.00	**	0.00	0.00	**	0.00
For-Profit School	-0.65	**	0.20	-0.77	**	0.19
GPA	0.00	**	0.00	0.00	**	0.00
Nontuition expenses	0.03		0.02	0.03		0.02
Tuition	0.05		0.03	0.05		0.03
Loans	-0.01		0.02	-0.01		0.02
Grants	0.04		0.04	-0.01		0.04
FICC*Grants	0.00		0.03	0.06		0.04
FICC*For-Profit School	0.70	*	0.32	1.00	**	0.33
Grants*For-Profit School	-0.06		0.04	0.07		0.06
FICC*Grants*For-Profit School				-0.27	**	0.08
-2LL (intercept only: 5413.211)	5188.83			5179.57		
pseudo R^2	0.07			0.07		
Somer's *D*	0.25			0.25		

†$p < .1$ (interaction terms only); *$p < .05$; **$p < .01$

Model coding: 5 = grant nexus model, BB = 2YR-NP/2YR-FP sample, I = without 3-way interaction term, II = with 3-way interaction term