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Financial Aid as Retention Predictor: The Relationship of Financial Aid to Retention at a Virginia Community College

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FINANCIAL AID AS RETENTION PREDICTOR:

THE RELATIONSHIP OF FINANCIAL AID TO RETENTION AT A VIRGINIA

COMMUNITY COLLEGE

by

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ABSTRACT

FINANCIAL AID AS RETENTION PREDICTOR:
THE RELATIONSHIP OF FINANCIAL AID TO RETENTION AT A VIRGINIA
COMMUNITY COLLEGE

Eunice I. R. Wine
Old Dominion University, 2011
Director: Dr. Dana Burnett

This study examined the relationship between student financial aid awarded, unmet financial need, and fall-to-spring student retention of students at a small, public, southeastern, U.S. community college. The research hypotheses drew upon past research on retention theory, employing economic persistence theory. This study focused on three areas: the amount of grant awarded per student, the amount of loan awarded per student, and the amount of unmet need per student. These variables were then used as the predictors for student retention.

The research methodology was an exploratory, non experimental quantitative study of *ex post facto* data using logistic regression. The participants of this study included students who enrolled in the fall 2008 and spring 2009 semesters in a community college and received financial aid in the form of Pell grants, Stafford loans, or both.

This research discovered the following. First, a positive significant predictive relationship was found between grant award amounts and retention. Second, a positive significant predictive relationship was found between loan award amounts and retention for financial aid students. Both the federal Pell grant and federal loans increased student retention rates, up 12 percent and 14 percent respectively. A negative significant

predictive relationship was found between amounts of unmet need and retention for financial aid students.

This research on financial aid as a predictor of student retention at community colleges is of interest to higher education, specifically community colleges, because of the increasing need to retain their student population until graduation and/or successful transfer to four-year schools. This study is also of interest to those in public policy and to those who allocate funding for financial aid.

My deepest appreciation and thanksgiving goes to my husband, and forever friend, David, who saw me through from start to, six years later, finish. David deserves the "D" for this Ph.D. because he held me accountable to get it *done*.

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CHAPTER 1

INTRODUCTION

According to a study in *Community College Week*, students at colleges and universities are relying more and more on financial aid to achieve their education goals (Pekow, 2006). "Sixty percent of all undergraduates received student aid, averaging about $6,600. Almost half - 49 percent - received grants and 30 percent received loans. Among two-year college students, 27.4 percent received need-based grants and only 4.6 percent received merit-based grants," (Pekow, 2006, p. 11). Because of this continued and increasing reliance on federal and state financial aid, administrators in community colleges and other higher education institutions as well as stakeholders in federal public policy need to know if a connection exists between the amount of student financial aid awarded and student retention rates. For example, does receipt of federal financial aid result in retention? Are there any variations in this effect for loans versus grants?

President Barak Obama recommended that federal Pell grants increase to a maximum of $5,550 beginning in the 2010-11 academic year, while he promoted deleting other redundant forms of financial aid (FFELP Stafford Loan Program) during his second year in office (United States Department of Education, 2008). In the *College Cost Reduction and Continued Access Act,* he also indicated he will recommend other changes that will generate even more Pell grant usage-such as awarding 200% of a student's Pell grant eligibility in one academic year (United States Department of Education, 2008). More than 100 billion was committed to Federal financial aid in the current academic year (Bowen, Chingos, & McPherson, 2009).

Due to the current economy, and many job losses for parents of community college students, future students may have to rely more heavily on financial aid to support the costs of their education. Student retention and student matriculation have historically been issues for colleges and universities, but are becoming more important for all colleges (Tinto, 1994; Robotham & Julian, 2006).

Financial Aid Policies & Procedure Guidelines

It is the plan of the federal government to increase financial aid appropriations annually (Spellings, 2006; U.S. Department of Education, 2008). A brief perusal of most educational journals, and *The Chronicle of Higher Education,* indicates that financial aid grant and loan programs, and gradually more federally regulated private loan programs, are here to stay (Spellings, 2006). With the recent passage of the new Higher Education Opportunity Act of 2008, both the federal Pell grant annual amounts and the federal student loan amounts were increased. Also with the College Cost Reduction and Continued Access Act of 2008, the maximum Pell grant amounts increased from $4,731 in 2008 to $5,350 in 2009 (increased 619 dollars) and are scheduled to increase incrementally each year ($5,550 in 2010), while loans were increased by a blanket $2,000 more for every student category, whether dependent freshman or sophomore, or independent freshman or sophomore (U.S. Department of Education, 2008). With every change in each federal financial aid piece of legislation, a federal policy manual, handbook, or procedures guideline is issued to financial aid offices.

Every post-secondary institution in the United States of America that offers any type of publicly funded financial aid has a written policy and procedures manual for staying in compliance with federal regulations. A brief Internet search conducted in the fall of 2009 for "Financial Aid Policies and Procedures" resulted in more than 3 million hits, most of them college or university financial aid websites and online documentation for accreditation or federal legislation. Mirroring the national goals for financial aid, (1) *to enroll more students*, (2) *to increase affordability*, and (3) *to promote equality of opportunity*, these written policies and procedures seek to achieve these stated goals (Brooks & NASFAA, 1986). It is the role of financial aid directors at offices all across the United States to make sure these policies and procedures are followed to the letter in order to remain in compliance with federal reporting and audit oversight.

Higher Education administrators acknowledge the importance of having a financial aid office at their institutions, but senior administrators may not realize the amount of total tuition revenue that is paid directly by financial aid programs – as much as 33 percent of the tuition bill at some community colleges (Institutional Data, 2005-2009). Students also acknowledge that having aid programs and receiving aid is important to them personally (Atkins-Brady, 2009). There may be a connection between the type of financial aid students are awarded and the length of time they remain at the institution (Institutional Data, 2005-2009). The current research seeks to determine the relationship between Pell grants awarded, Stafford loans awarded, amounts of unmet need in a student's financial aid cost of attendance budget, and fall-to-fall student retention. Nevertheless, many students seem to have little focus on outcomes, or degree attainment. This lack of specificity in goals is demonstrated by the numerous Stafford

loan request forms at community colleges across the country with the question for estimated date for degree completion left blank or completed with "no idea," (Southern Association of Student Financial Aid Administrators, 2010).

Financial Aid Packaging Practices

The financial aid award process is explained in detail (Brooks & NASFAA, 1986). When a student fills out a Free Application for Federal Student Aid (FAFSA) on the federal website: http://www.fafsa.gov the application is sent to the colleges or universities (the FAFSA can be sent simultaneously to 10 institutions) the student has listed on their FAFSA, provided the student had also applied for admission at these institutions previous to completing the FAFSA. When the school receives the FAFSA (now called and Institutional Student Information Record, or ISIR), which has already been processed by the U.S. Department of Education, it has an Expected Family Contribution (EFC) number assigned to it. It is this EFC number which ranges from 0 to 999,999 that the financial aid offices at each school must use in conjunction with the actual cost of attendance (COA) at their school to package an aid award. Schools cannot offer awards of grants, loans, etc, of greater value than the cost of attendance. See Appendix A for complete definitions for all the financial aid terms used for this research. The EFC is determined by federal methodology:

> Using a set of rules defined by Congress, the Department of Education used the information from the FAFSA to generate each student's Expected Family Contribution, or how much each family can afford to pay annually for a child's college education. Students' eligibility for aid is based on Expected Family

Contribution, year in school, enrollment status, and the cost of attendance at a student's expected post-secondary institution (Tierney, et al, 2007, p. 20).

The number in the family, parent income and assets, student income and assets, and amount of taxes paid by the family all play a role in the federal methodology formula which is quite convoluted and complex to calculate manually on worksheets (Federal Student Financial Aid Handbook, 2009). Using the 2009 federal methodology formula, an independent student with no dependent children and an income of 30,000 dollars is expected to contribute 30 percent of their income toward their educational costs, or have an EFC of 10,000 dollars. However an EFC at this level and for students attending most community colleges would make this student eligible only for loans. Appendix B provides actual packaging scenarios at the community college for this study.

To provide a benchmark figure for the current study, in 2005 a small, public community college in the southeast awarded $1.8 million in financial aid to its students. In 2008, this same college has offered just over $5 million in aid (Institutional statistics, 2005-2009). In 2010, this college reached the $6.4 million mark in financial aid awards via Pell grants, federal loans and some state grants. Simultaneously, this community college had a 14 percent graduation rate in 2006, but had a 11 percent graduation rate in 2009 (Institutional statistics, 2005-2009). Although the financial aid award amounts continue to rise cumulatively and per student, the graduation rate of the college has dropped in the last five years. However, the transfer rate of students continuing their education at a four-year school remained at 16 percent in 2009. The actual retention rate of students (defined by continuous enrollment in credits from semester-to-semester) at

this college was 64 percent in 2009. These perplexing data lead to student retention predictor questions: Why is the graduation rate dropping when student are receiving more financial aid than ever before? Are students remaining enrolled in college longer to receive loans longer? The current study will analyze the effect of the receipt of financial aid on student retention at the community college level.

Statement of the Problem

The intention of this study is to determine the relationship between student financial aid awarded, unmet financial need, and fall-to-spring student retention of students at a small, public, southeastern, U.S. community college. Specifically, this research is to study the predictor effects of Pell grants, Stafford loans, and remaining unmet need on the fall-to-spring retention for these students.

Research Questions

1. To what extent does the amount of Pell grant awarded predict retention from fall to spring semester? Responses to this research question will examine both the amount of the award and whether that student continues at the college to see if there is a predictive relationship between the two variables.

2. To what extent does the amount of the Stafford loan award predict retention from fall to spring semester? Responses to this research question will examine the predictive relationship between the amount of loans in the financial aid package and fall-to-spring student retention.

3. To what extent does the amount of unmet need in a student's financial aid budget predict retention from fall to spring semester? Responses to this research question will examine the relationship between the amount of unmet need in a student's financial aid budget after that student has been awarded all the financial aid for which they are eligible and whether that student continues at the college the following two semesters.

4. Is the age of the students related to retention from fall to spring semester?

5. Is the gender of the students related to retention from fall to spring semester?

6. Is the ethnicity of the students related to retention from fall to spring semester?

7. Is the Grade Point Average (GPA) of the students related to retention from fall to spring semester?

8. Is the year in school (freshman or sophomore) for the students related to retention from fall to spring semester?

9. Is dependent or independent status of the students related to retention from fall to spring semester?

This last group of research questions pertains to background demographics which may influence retention and will be studied with a logistic regression test to see if there is a significant relationship between any of these items and student retention. All of these research questions will draw upon past research on retention theory (Tinto, 1994; Robotham & Julian, 2006; Stevenson, et al, 2006; Wessel, et al, 2006).

Limitations

This research is limited by the number of participants (n < 346) in the study and the data are collected from only one college. A larger, random, study sample obtained

from several different colleges would create results that could be generalized beyond this one campus; however, this community college is comparable to others of its size and location.

Background

Several recent studies have focused on the area of financial aid; many others have examined the factors that correlate with student outcomes (Dowd & Coury, 2006; Wessel, Bell, McPherson, Costello, & Jones, 2006). Few studies have looked at the relationship between financial aid and student retention. Little data exists that relates the amount of Stafford loans borrowed as a determinant of student retention. The literature review for this study focused on the past and current literature on retention in college and financial aid, particularly on Stafford loans; however, financial aid grants and Stafford loans may be used interchangeably in the literature under the term, "financial aid".

After a systematic search of the main education databases available through university systems and the state of Virginia, it became apparent that although 100 billion tax-payer dollars are committed to state and federal financial aid each year, other than accounting audits to make sure the schools have awarded the correct amount of financial aid, there are no means to measure the impact of funding on individual student retention. "Some forms of financial aid represent true inflows of resources to the institution, while others merely pass through the institution's accounts as they make their way to the students. Current accounting guidance dictates that revenues be considered only once," (Goldstein, 2005, p. 11). Thus, financial aid has been employed

to cover the costs of college for decades, but the affects of financial aid on student retention remain largely unexamined.

Since there is currently no applicable measure of impact of dollars per student outcomes, it occurred to the researcher that the state and federal governments may require such "return on investment" accountability in the future (Phillips, 2003). According to the U.S. Department of Education, one of the federal government's current items for action is, "Commission an independent management consultant review of the federal financial aid system" (Spellings, 2006). Although the current researcher is operating independently from the U.S. Department of Education, the proposed research will focus specifically on community college students receiving Pell grants and Stafford loans to see if a relationship exists between the amounts and type of financial aid and amount of unmet need and retention from fall to spring semesters for those students.

Significance

This study will generate new knowledge regarding types and amounts of financial aid students receive and financial aid's relationship to student retention. Thus, the new data will be useful to those who manage financial aid programs at community colleges and also to all those at colleges and universities who have an interest in increasing student retention, typically the senior leadership. It may also be of interest to those in Congress who allocate funds in support of Americans who need financial support in order to complete their education.

From the institution's perspective, the retention of students is necessary for financial stability and to sustain academic programs. Public policy makers are

advocating accountability, and one strong measure is student retention leading to graduation or transfer. Additionally, the federal Higher Education Act may use graduation rates as a measure of institutional effectiveness. And finally, if not most importantly, we want our students to have a positive college experience, complete their academic goals, and enter the workforce (Fike & Fike, 2008).

This study has direct application for higher education and community college administration. The community college systems are losing students to both proprietary and online higher education institutions. In light of this situation, it would be of interest to know what types of interventions (perhaps employing financial aid) would be beneficial to implement in order to better retain community college students, especially those in the lower-socioeconomic strata. The positive social change that could occur because of this research project is increased future retention and matriculation of low-income students at community colleges and therefore a more educated and skilled citizenry. As Perna (2005) states, "civic engagement is positively related to educational attainment" (p. 43). If this study contributes in any way to more knowledge on how to retain more students through graduation it will have benefited society.

Definition of Terms

1. A *financial aid student* is defined as any student who received a federal financial aid award, either grants or loans. For the purpose of this study, all outside scholarships, private loans, institutional scholarships, and tuition payments made by employers will be excluded from this analysis.

2. A *grant* is defined as the federal Pell grant, including the Supplemental Education Opportunity Grant-considered the additional Pell grant.

3. A *loan* is defined as a federal Stafford loan, whether subsidized or unsubsidized.

4. The *unmet need* for a student follows the federal methodology for processing a FAFSA and is defined as the Cost of Attendance (COA) at the college minus the Expected Family Contribution (EFC) minus the total financial aid award the student was awarded. For actual examples of this, see Appendix B.

5. The *FAFSA* is the Free Application for Federal Student Aid. New versions of this application are available annually on January 1st on the federal government website: https://www.fafsa.gov.

6. The *cost of attendance* is defined as the monetary amount in a student's budget that the school financial aid office estimates is needed by the student to attend the institution. The cost of attendance is also known as a financial aid student's *budget* and takes into consideration the cost of living in that area, along with the more traditional cost items of actual tuition rates, textbook and supply costs, and transportation to and from the college from a reasonable distance.

7. The *expected family contribution* is defined as the number that the federal government has assigned to the student after processing the student's FAFSA and applying federal methodology to parent and student income and asset information. The actual questions on the FAFSA vary slightly from one year to the next, and as a consequence, the federal methodology differs as well.

CHAPTER 2

REVIEW OF LITERATURE

> Financial aid policies designed to offset the effects of rising tuition are surely one
> potentially important tool that can be used by governments and universities to combat
> the lower gradation rates we observe among disadvantaged populations…Indeed, there
> is growing awareness that the proper role of financial aid lies in enabling students not
> simply to *attend* school but to *finish* their degrees [emphasis mine] (Bowen, Chingos, &
> McPherson, 2009, p. 149).

"Redeant in aurum secula priscum." Let the ages return to the first golden period. (In

reference to the mission of community colleges to educate our citizenry)

Two core points of interest concerning the current research are financial aid and

retention of community college students; therefore, these two areas of research are

investigated for previous scholarly efforts and publications. Due to the nature of

education research, even student services research, there is an essential need for

generativity in a piece of new scholarship related to retention. "A substantive, thorough,

sophisticated literature review is a precondition for doing substantive, thorough,

sophisticated research," (Boote & Beile, 2005). Specifically, this review will synthesize

historical and recent literature of both financial aid awarding policy and student

retention, focusing with extra emphasis on community college students.

First, the history of community colleges as a unique institution type will be

reviewed, followed by recent studies of community colleges and retention. Next, an

overview of financial aid will be described, followed by a synopsis of recent financial

aid policy and practice, and culminating in recent scholastic studies of financial aid and

community colleges. The third and final theme to be reviewed in this chapter will be a

discussion of retention theory, with general retention predictors examined by study type ending with the most recent studies of retention. The culmination of the literature review will be a synthesis of recent studies combining all three topics of community colleges, financial aid, and retention.

Brief History of Community Colleges

According to *The Community College Story*, a book commissioned by the American Association of Community Colleges (AACC), the mission of community colleges in America is to "provide access to postsecondary educational programs and services that lead to stronger, more vital communities" (Vaughan, 2000, p. 3). The AACC is the primary advocacy organization for community colleges in the U.S. and represents more than 1,100 two-year institutions and over 10 million students in the United States of America (American Association of Community Colleges, 2009).

Community Colleges Defined

The United States, Canada and the United Kingdom all use the term 'community college' to label one of the unique institutions within the higher education community. For the purposes of this research, and in general, an American community college is defined as, "A regionally accredited institution of higher education that offers the associate degree as its highest degree" (Vaughan, 2000, p. 2). Webster's definitions are consistent with Vaughan's definition, but Webster acknowledges the financing of the community college in its first definition: "A two-year government supported college that offers an associate degree." In Webster's second definition the focus is on community:

"A college or junior college, usually non-residential, serving a specific community often by fitting its curriculum to the community's needs" (Websters, 1971, p. 460). In addition, *The Oxford American Desk Dictionary and Thesaurus* also emphasizes the service to the community in which each community college is located by its definition: "A non-residential junior college offering college courses to a local community or region" (2001, p. 152).

Consequently, an American community college is usually a public institution of higher education that typically offers two-year associates degrees and vocational certificate training at a reasonable tuition rate, with an emphasis on open access to the public in the immediate community in which it is located. Community colleges in America normally offer a transfer track to students planning to attend a four-year institution after obtaining their general education requirements at these two-year colleges. In the past, many of these institutions were known as 'junior' colleges, but due to their service orientation to local communities a number of them changed their names to 'community' college.

Community colleges can be further identified as having the following traits: (1) Non-selective admission policies; (2) Affordable tuition rates; (3) Generally, two-year degrees; (4) Focused vocational training in addition to regular academic courses; (5) Local community settings for easy access; (6) Student services personnel-to-student rapport; and (7) Smaller class sizes (AACC, 2009). Although community colleges continue to be listed among the least well funded of educational institutions, individual states continue to serve as a major financial support for community colleges. Nationwide, states contribute, on average, 38 percent of operating budgets (AACC, 2009). The federal

government contributes an average of 15 percent of community college operating budgets at the national level (AACC, 2009). While these are national averages, the amount of the operating budget funded by the state varies greatly from state to state, depending on the financial resources of each state and the importance placed on education by each governor.

According to statistics from the AACC, 44 percent of undergraduate college students are enrolled in a community college. This is almost one-half of the undergraduate population in America today, yet there are very few studies conducted solely on community college students, creating a gap in general retention research.

Quick Facts for American Community Colleges

Total number of community colleges	1,177
Total enrollment of students	11.7 million
Associates degrees awarded annually	612,915
Certificates awarded annually	328,268
Average tuition and fees (public)	$2,402
Total students 21 or younger	47%
Total students 22 or older	53%
Total female students	58%
Total male students	42%
Percentage of Pell Grant usage	31%
Percent of U.S. undergraduates	**44%**

(Community college facts reported from the American Association of Community Colleges in 2009).

Community colleges are institutions that meet students at every stage in life, both economically and socially, especially if they have never had a higher education experience before (AACC, 2009). The low tuition and fees, smaller class size, and one-to-one assistance of the student services personnel allow them to excel academically when the challenges of adjustment at a four-year residential institution may have proven too difficult to overcome (AACC, 2009). The various unique aspects of community colleges which set them apart from their four-year residential sister institutions will be discussed next.

Institutional Differences. There are numerous differences between community colleges and their four-year counterparts. First, complex articulation agreements vary from community college to community college on what credits are recognized as transfer credits (Vaughan, 2000). Secondly, many courses are taught by generalist adjuncts rather than full-time tenured professors who are long-time specialists in their fields. Community college presidents are working to increase their ratios of full-time to part-time professors, but community college usually have around 70 percent full-time to 30 percent part-time instructors (AACC, 2009). Third, most community colleges are commuter only and do not offer residential housing or athletics programs. Therefore, students and parents need to account for higher gasoline and transportations costs. Conversely, not offering residential housing also greatly reduces the operating costs of community colleges (Vaughan, 2000). In addition, the lower cost can be partially attributed to the fact that community colleges are public schools and are subsidized by their states (United States

Department of Education, 2010). As a result, most community colleges have a price tag

per credit that is one-third of the tuition cost for four-year institutions (Vaughan, 2000).

Another of the main differences of community colleges in contrast to four-year

institutions is their focus on the local community and immediate needs of local students.

For example, community colleges are known for the capacity to create new programs of

study to reflect needs for certification in the industry such as, utilities line repair

certification, veterinarian technician studies, culinary certifications, and many technical

certifications for employment in the information technology and computer repair fields

(AACC, 2009). A final difference is the emphasis on life-time learning. There are usually

no time limits set on how much time a student may take to complete the degree and part-

time enrollment is the expected norm (Vaughan, 2000). This expectation of long-term,

part-time enrollment at community colleges may complicate student retention research

studies conducted with a community college population.

Community College Educational Programs. Community colleges generally offer

three levels of academic programs. The first level, mentioned previously is the two-year

Associate's degree. Students taking 'core requirement' credit courses in these degree

programs may also choose to transfer to a four-year college or university after a year or

two of courses. Students who take the transfer track often do not show in a community

college's graduation rate because they do not complete all the requirements for a diploma

before they relocate. In many states there are 'guaranteed transfer agreements' if the

student has achieved the two-year degree before transfer. The second level of community

college offerings includes the certificates for various vocational training areas, such as

nursing, office administrative assistant, computer repair, or welding. The third level of educational coursework is adult continuing-education classes, developmental classes, GED programs, or business contract courses to offer specially tailored certifications through work-force services. The workforce services side of community colleges is typically classified as continuing education units rather than credit courses that are accredited by a regional accrediting association such as the Southern Association of Colleges and Schools (SACS). For the proposed study, the student sample includes only students enrolled in credit-based curriculum programs, rather than work-force services.

Community College Open Enrollment. In the American community college system, unlike selective European community colleges, enrollment is open admission for anyone with a high school diploma or GED, not-with-standing placement testing scores or previous college academic records (AACC, 2009). As a result of the open access to enrollment, many students enrolled in community colleges may not be academically prepared for the challenge of college level assignments (Wilmer, 2008). Many of these students need to take developmental courses. These factors may affect student retention rates (Wilmer, 2009). Because of this open enrollment policy, the demographics of community college student populations are not comparable to the student populations at four-year institutions and so previous student retention research conducted at such institutions cannot be generalized for the community college student population (Tinto & Love, 1995; Wild & Ebbers, 2002; Rogers, 2005).

Reviewing the Community College Timeline

The community college story began long before 1947 when President Truman's Commission on Higher Education proposed that community colleges should be established in every state (Parisi, 2008). Deegan & Tillery's book, *Renewing the American Community College,* is one of the more comprehensive writings on community colleges (1985). The authors trace the history of community colleges from their beginnings through 'five generations' or stages of growth up to 1985. To continue the saga up the present time of this publication, "The Community College Story," gives a more recent update on the brief history of these institutions (Vaughan, 2000). It is essential to review the heritage of the community college in American as we analyze its present student retention which, in turn, has implications for the future of community college story in America.

Stage 1 - High School Extension. First, in the early 1900's through 1930, community colleges were seen as an extension of high school and their courses were often taught in a high school in the evenings or on weekends (Deegan & Tillery, 1985). During this stage, community colleges were viewed more as providing preparatory classes before entering into universities or as 'elective' or advanced course offerings of the high school itself. A model example for future community colleges began at the high school in Joliet, Illinois. In 1901, the school board approved postgraduate courses and studies there (Vaughan, 2000). The program grew until 1916 when it separated from the high school, and in 1917, became known as Joliet Junior College (Vaughan, 2000). However, the establishment of a junior college system was important for four reasons:

(1) It demonstrated that a well-equipped public high school could offer college-level courses equal to those offered by a university. (2) It demonstrated the feasibility and desirability of using tax dollars to offer postsecondary education in the community. (3) The needs of the community helped shape the courses and programs offered by this community-based institution. (4) The acceptance of courses offered by Joliet by the University of Chicago and Northwestern illustrated the feasibility and practicality of transferring courses from a public junior college to a university (Vaughan, 2000, p. 23).

All four of these reasons are still pertinent to community colleges today. In 1907, California also led the way in the formation of a community college system when it gave the legislative approval for high schools to offer up to two years of college courses. Other states followed suit.

Stage II - Junior College. Ten years later, California authorized local school districts to form public junior colleges (Vaughan, 2000). In 1921, the legislature took community college formation one step further – by allowing the creation of independent public junior college districts with governance from local boards (Vaughan, 2000). Again, other states around the nation, followed the pattern set by the west coast and soon Texas, Oklahoma, Illinois, Mississippi, Missouri, Iowa, Kansas, and Michigan had founded the beginnings of community colleges. In 1930, the American Association of Junior Colleges (AAJC) was founded. From 1930 to 1950 many community colleges transitioned to be called 'junior' colleges (Deegan & Tillery, 1985). At this time, their function was more as the younger sibling of 'real' colleges and universities. Most of them offered college level coursework that would transfer to four-year schools.

Stage III - Community College Golden Age. In 1947, with the advent of the

Truman Commission, the term 'community college' was coined. From 1950 to1970 more

emphasis was placed on the service to local community part of the charge for these

colleges (Deegan & Tillery, 1985). The 1950's were a time of transition, trial, and error

for community colleges. Some of them thrived while others converted to different types

of institutions and several closed down.

The Golden Age of community colleges began in the 1960's. According to

Vaughan, "Between 1960 and 1970, 457 new colleges opened throughout the country,"

(2000, p. 25). Several reasons for this unprecedented increase in two-year institutions

included the passage of the Higher Education Act, providing more federal funding, and a

trend toward states shouldering the burden of financial support for these colleges. Other

forces affecting the rapid expansion of community colleges were the maturation of the

baby boomer generation and the desegregation of education in the South (Vaughan, 2000.

In 1972, the AAJC changed its name to the American Association of Community and

Junior Colleges (AACJC).

Stage IV - Comprehensive Community College. From 1970-1985 – the function of

community colleges and expectations for community colleges began to shift. During this

decade and a half, community colleges were expected to play many different roles to

many different people. The words, 'comprehensive services' began to be used in

reference to community colleges at this time.

They [community colleges] remained committed to providing the first two years

of a liberal arts baccalaureate education, but they also responded to economic downturns

with commitments to workforce retraining and community development. Local and state

governments and the federal government offered varying levels of support, and some colleges thrived more than others (Vaughan, 2000, p. 26).

Stage V – Present Community Colleges Trends. In 1992, the AACJC changed its name to the American Association of Community Colleges (AACC) comprising more than 1,000 member institutions. The AACC publishes a research journal regularly and provides visionary leadership to administrators of present day community colleges. From 1985, and up through the present decade, there have been six distinct modern trends at community colleges (Deegan & Tillery, 1985; AACC, 2009).

The first trend has been a surge in adult enrollment. According to the most recent official AACC report, the average age of community college students is now 29 years old (AACC, 2009). The AACC along with ACT, commissioned a survey conducted by Takako Nomi, *Faces of the Future: A Portrait of First-Generation Community College Students,* regarding the changing demographics of the community college student body nationwide. The author discovered that 51 percent of community college students are first-generation students – neither parent attended college (Nomi, 2005). The survey found that, "First-generation college students are more likely to be women, older than traditional college age, employed full time, with dependents living at home" (Nomi, 2005, p. 1). The research also revealed that these older students typically take fewer credits hours per semester and face difficult financial and family issues. The AACC study also found, "Financial aid is a major source of support for first-generation college students, and they are less likely to receive financial support from parents for college-related expenses," (Nomi, 2005, p. 2). In summation of the first trend in modern community colleges, research reveals fewer numbers of traditional-aged students among

the modern community college demographics and an increasing reliance on federal

financial aid by those who attend (Nomi, 2005; AACC, 2009).

The second trend is the regional and community differentiation among current

community colleges (Deegan & Tillery, 1985). There are varying missions and

institutional goals for modern community colleges depending on the local region where

each community college is located. With their commitment to serve the local

communities in which they find themselves, the differentiation of degrees and certificate

offerings is great. According to the AACC, some community colleges are contemplating

the idea of offering bachelor's degrees and eliminating the need to transfer (Vaughan,

2000). Some already offer a four-year degree for certain programs such as Registered

Nursing. Regardless of their physical location, community colleges are also experiencing

unprecedented differentiation in the courses and programs that are requested by their

constituents. The academic services and work force services divisions of community

colleges are kept occupied designing certificate and degree programs to keep up with

industry demands.

The third trend in modern community colleges is the rapidly developing use of

technology and learning innovations in teaching (Deegan & Tillery, 1985; Vaughan,

2000; AACC, 2009). Technology will continue to influence the teaching and learning

process at community colleges. Because of the convenience it affords, more students will

want to take distance education courses. Competition from for-profit institutions will

increase the pressure on community colleges to offer courses at times and places that are

convenient for the students. Technology will require an increasingly large percentage of

the college's resources, often forcing administrators to choose between personnel and

technology (Vaughan, 2000, p. 28). Because technology use allows community colleges to offer distance education courses and programs, the service regions for the individual colleges will overlap more and more. Community colleges may even compete internationally for students in other countries.

The fourth trend is tied to the American economy – in troubled economic times community colleges' competition for public money will increase (Deegan & Tillery, 1985). During times of budget cuts at state or federal levels, community colleges must contend with other public funding needs for operational allocations. Consequently, when state or federal contributions to community colleges decline, they are forced to look elsewhere to make up the shortfall in their budgets (AACC, February/March 2010). One traditional solution is to raise tuition rates. However, this has a negative impact on access for those who cannot afford the added expense of a tuition increase. Dwindling public commitment of funds also leads to innovative fundraising on the part of Institutional Advancement offices at community colleges. The use of endowments, grant-writers, and ticket revenues for public entertainment events is rising in addition to traditional capital campaigns (AACC, February/March 2010).

The fifth trend for modern community colleges is similar to that of four-year institutions - Aging facilities and equipment will become more problematic (Deegan & Tillery, 1985). Since the majority of community colleges were founded and constructed in the 1950's, 1960's, and early 1970's, the physical condition of the buildings and infrastructure requires numerous repairs and/or re-construction. One of the items in every operating budget is dedicated to deferred maintenance and repair costs (Goldstein, 2005). When deferred maintenance is employed as a money-saving mechanism of a college, the

repair costs for certain facilities are postponed for the future and a backlog of deferred maintenance is recorded until the budget is more robust (Goldstein, 2005, p. 84). This is beneficial in the short-term to colleges in budgetary crises, but can be costly in the long-term if old wiring results in a building catching on fire, etc.

The sixth and final trend is the fact that the average age of community college employees will continue to rise (Deegan & Tillery, 1985). Approximately 70 percent of a college's operating budget is usually allocated to personnel (Goldstein, 2005). The community college may suffer 'loss of institutional experience' if too many staff retire at the same time (Goldstein, 2005, p. 139). This does, however, provide the college with an opportunity to change the job descriptions and pay grades of the vacant positions. It also brings in a new generation of younger employees who may be more comfortable and skilled in the use of modern technology and willing to work at a lower rate of pay than what retirees had earned from years of advances in salary levels.

Review of Community College Literature

In 1998, the National Association of Student Personnel Administrators (NASPA) obtained the services of editors, Marguerite Culp and Steven Helfgot to compose the monograph, *Life at the Edge of the Wave: Lessons from the Community College* (Culp & Helfgot, 1998). Although this monograph is a bit dated, the authors present a valid and complete view of the role of community colleges in the higher education landscape of America, with special emphasis on the tsunami-like increase in enrollment numbers in the last decade. Culp and Helfgot (1998) note the varied

demographics of the modern community college population and offer practical
suggestions for institutional coping strategies.

A more recent study is Bowen, Chingos, & McPherson's *Crossing the Finish Line* (2009) which examines the issue of baccalaureate degree completion of students (Bowen, Chingos, & McPherson, 2009). The authors conclude that beginning the degree at the community college is negatively correlated with completing a bachelor's degree (Bowen, Chingos, & McPherson, 2009). Such findings can be further addressed and investigated by more specific research on student retention at community colleges. Twelve years ago, only five percent of research reviewed for 'How College Affects Students' were studies utilizing community college student populations (Pascarella & Terenzini, 1998). As more scholars add to the body of existing knowledge for community colleges, future attendees at these institutions can benefit from the application of that knowledge.

Recent Studies of Community Colleges and Retention

More research related to the persistence of community college students would be of assistance to faculty and administrators at both two-year and four-year institution. Several student retention studies have been forthcoming in the recent years; nevertheless, researchers of student retention found that the last decade of literature for this topic does not adequately address the diverse and complex nature of retention for the community college population (Wild & Ebbers, 2002).

Given the fact that nearly 1,200 of our postsecondary institutions are community colleges and that they enroll more than 44 percent of all American undergraduates

annually, Wild and Ebbers felt a distinct need for community college researchers, ". . .

to rethink the issues of student retention and refine a definition of student retention for

community colleges…" (2002, p. 510). While their article was not an empirical study of

retention itself, the authors provided some useful and practical lists of strategies for

student retention that could possibly be applied in most community college settings:

> The strategies are: (1) developing indicators; (2) creating learning communities
>
> and cohort groups; (3) developing directed retention programs; and (4) developing
>
> tutoring programs and supplemental instruction. These strategies, when further
>
> developed, would provide the stepping stones for administrators, and in particular
>
> the directors of institutional research, to undertake a more comprehensive study of
>
> student retention that covers such matters as defining student retention,
>
> developing models, and increasing the amount of research on community college
>
> student retention (Wild & Ebbers, 2002, p. 510).

Their research article, found in the *Community College Journal of Research and*

Practice, systematically listed nine more specific recommendations directed toward

institutional philosophy for student retention and nine practical steps for implementing

institutional processes and procedures for student retention at community colleges. With

the current climate of accountability for education funding that we are experiencing in

Washington, D.C., (Advisory Commission on Student Financial Aid, 2002; Spellings,

2006; Rothstein, & Rouse, 2007; Roderick, Nagaoka, Coca, & Moeller, 2008) more

community colleges are beginning to focus on their retention rates and apply practical

measures to increase them. Wild and Ebbers (2002) also mention that it would benefit

student retention rates if the American Association of Community College advised community colleges on this vital issue.

Although empirical retention research is historically sparse, another recent research article in the *Community College Review*, entitled, "Predictors of first-year student retention in the community college," is very relevant to the current study because it employs dichotomous retention variables and a community college student sample. Similar to the present study, David and Renae Fike (2008) utilize logistic regression as the statistical method for the study which "analyzed predictors of fall-to-spring and fall-to-fall retention for 9,200 first-time-in-college students who enrolled in a community college over a four-year period," (p. 68). In addition to logistic regression, the authors used bivariate correlation coefficients to discover the association of student retention with each predictor variable. Following this, the logistic regression models were employed for all of the following predictors. In this study over 50 percent of the first-time-in-college students were not retained from fall to the following fall (Fike & Fike, 2008).

The authors discovered the predictor variables of passing developmental courses-particularly developmental reading courses, taking Internet courses, participating in the Student Support Services program (a federal TRIO program), receiving financial aid, parent's education level including some college, and the number of hours enrolled in the first semester all indicated levels of student persistence at a significance level of .05 or higher. In agreement with Wild and Ebbers, Fike and Fike (2008) stated that community college student characteristics are different from university students and their retention predictors merit further scholarship. This concludes the discussion of recent studies on

community colleges and retention and turns our attention toward the background of federal financial aid.

Brief History of Federal Financial Aid

There were no public resources for the support of the costs of education when the first colonial college was founded in 1636. Membership in the student body of post-secondary institutions of higher learning was restricted to those with disposable income for study. The passage of the Morrill Act of 1862 and 1890 was the first large scale use of federal resources (land) to support higher education (Wilkerson, 2005). Later in 1935, the New Deal social program entitled the National Youth Administration helped students "earn" funds for their post-secondary education. However, it was not until after World War II that the federal government of the United States became heavily committed to providing funding for college education for its citizens. Each of the above milestones in the history of federal funding for higher education will be addressed in a linear order.

Morrill Act. The 1862 Morrill Act deeded 30,000 acres of federal land for each member in their Congressional district for states to use the land for the establishment of an "agricultural and technical college" or sell the land to finance the same (Library of Congress, 2009). The 1890 Morrill Act required all states that maintained dual segregated higher education systems for white and African American students to provide at least one land-grant college for African Americans, and the funding used to establish and maintain the black college had to be equal to that of the white college (Library of Congress, 2009).

According to the mandates of the Morrill Act, these institutions would have 'an emphasis on agriculture and the mechanical arts' (Vaughan, 2000). These acts were a modest beginning for the modern financial aid system and provided federal "annual appropriations to the land grant colleges," (Parisi, 2008, p. 20). Of greater importance to the current research, these land grant universities, "Included types of students previously excluded from higher education," (Vaughan, 2000, p. 31). These Morrill Acts were passed at the time of the Civil War in America (1862) and during the reconstruction period (1890) after the conflict, acknowledging at a federal level that lack of financial resources should not be a barrier to completion of a college education (Parisi, 2008).

National Youth Administration. In 1935, one of the New Deal federal programs at this time included the National Youth Administration (NYA). The purpose of this program was to enable future college students to earn financial support for their education. The way the NYA achieved this purpose was, "To help shift federal aid assistance to colleges to target federal assistance directly to individual students," (Parisi, 2008, p. 21). This program was, perhaps, an antecedent to the later work-study program we have in place today.

GI Bill. The first federal financial aid program from which students received tuition assistance was the Serviceman's Readjustment Act, also known as the GI Bill of Rights (Rogers, 2005). The GI Bill paid tuition for veterans who had served during World War II. In his volume, *On Higher Education: The Academic Enterprise in an Era of Rising Student Consumerism,* Reisman (1998) gives us a glimpse of how the GI Bill funds were applied:

A number of these GIs had been moved around the United States, and some had

been educated in the V-12 programs at Ivy League American universities. The

GI Bill of Rights of that period enabled them to purchase the best education to

which they could gain access, independent of tuition charges, and thereby freed

them to attend selective residential colleges… (p. 45).

It was not until the passage of the GI Bill for Vietnam veterans that returning

service members were paid a fixed monthly stipend for their college costs (Reisman,

1998). A version of this monthly stipend, or veterans' education benefits, is still in use

today for the returning Iraq and Afghanistan service members.

The Higher Education for American Democracy Act. In 1947, the President's

Commission on Higher Education proposed a national scholarship program for non-

veteran students (Parisi, 2008). The 1947 act was called the, "Higher Education for

American Democracy Act," but it resulted in a Report that recommended:

"..the establishment of a network of public community colleges that would

charge little or no tuition; serve as cultural centers; be comprehensive in their

program offerings with an emphasis on civic responsibilities; and serve the area

in which they were located (Vaughan, 2000, p. 33-34).

Thus, community colleges were commissioned by the federal government and have

been one of the line items in the federal budget – to varying degrees depending on the

economy – since 1947.

National Defense Education Act. In 1958, Congress passed the National Defense

Education Act (NDEA) as one of the nation's responses to the launch of Sputnik by the

Russians. Rogers states the purpose for the NDEA was to, "Promote national security

and diminish the technological threat of the Soviet Union," (2005, p. 3). The U.S. Department of Education concurs that one of the purposes of NDEA was to make certain that, "Highly trained individuals would be available to help America compete with the Soviet Union in scientific and technical fields," (U.S. Department of Education, 2010). The NDEA included, "Support for loans to college students...graduate fellowships...and vocational-technical training," (U.S. Department of Education, 2010).

Higher Education Facilities Act of 1963. In the 1960's, President Lyndon B. Johnson's Great Society programs were a foundation for the financial commitments by the federal government to all qualified, but economically challenged students to afford a higher education. The Higher Education Facilities Act of 1963 granted funds to communities to build new campuses and expand or update existing facilities (Vaughan, 2000). Students benefited directly by having additional, newer and more effective colleges to attend as a result of this Act of 1963.

Educational Opportunity Act of 1964. The Educational Opportunity Act of 1964 initiated the federal College Work Study program. The purpose of this federal financial aid program is to provide campus employment opportunities for economically challenged college students (Parisi, 2008). This program is still active today and is now renamed the Federal Work Study (FWS) program. This act was part of President Lyndon B. Johnson's War on Poverty. The President believed that by educating more Americans with a college degree, fewer constituents would remain on welfare or government subsidy programs because they would have better jobs. The program, which started in 1964 with the passage of the legislation, enables students to work on or

off-campus, at educational facilities such as after school tutoring programs, for a bi-monthly federal paycheck generally processed through college payroll systems (Brooks & NASFAA, 1986).

Higher Education Act of 1965. The Higher Education Act (HEA) of 1965 created the first major federal grant, the Educational Opportunity Grant Program. It was primarily the Higher Education Act of 1965, and its subsequent reauthorizations, which provided federal grants and loans directly to students based on the students' economic need (Vaughan, 2000).

Higher Education Amendment in 1972. With the reauthorization of the Higher Education Amendment in 1972, the HEA renamed the first federal grant program (Educational Opportunity Grant) of 1965 the Basic Education Opportunity Grant (BEOG) (Rogers, 2005). The first federal need analysis formula was established for this grant and the maximum award amount for this grant was $452 (U.S. Department of Education, 2010). Additional funds for federal grants were named Supplemental Educational Opportunity Grants (SEOG). In 1980, the Reauthorization of the Higher Education Act renamed the BEOG after Senator Claiborne Pell from Rhode Island, in recognition of his legislative contributions to enlarging the amount students would receive (Brooks & NASFAA, 1986). It is this Pell Grant program that the current research proposes to study together with federal Stafford loans. These were the humble beginnings of the involvement of tax payer funded educational pursuits in America which would later grow into the 20 billion dollar industry in the 1980's (College Board, 2003). Today, the federal budget commits more than 100 billion in different types of aid to students (Bowen, Chingos, & McPherson, 2009).

Pell Grant Program

The Higher Education Act (HEA) of 1965 created a federal grant program which was re-formed into the federal Pell grant program several years and name changes later. The HEA of 1965 contains a section well-known to financial aid administrators as Title IV (Brooks & NASFAA, 1986). Consequently, the financial aid programs, such as federal need-based grants, federal loans, Work-Study, are considered Title IV aid programs. Since the 1976 Higher Education Amendments were passed, students qualify for the Title IV types of financial aid by passing two-thirds of their classes and keeping an adequate GPA also known as meeting the Satisfactory Academic Progress Standards of the school (Brooks & NASFAA, 1986). This change in 1976 brought more accountability to the Title IV forms of aid because students who were not achieving a degree in a timely fashion could not continue to qualify for aid indefinitely (U.S. Department of Education, 2010). Title IV eligibility is limited to students who have less than 150 percent of the credits they need to graduate from their program of study or to 18 continuous semesters of enrollment activity (Federal Student Financial Aid Handbook, 2009).

Purpose for Pell. The economic reasoning for legislating the Pell grant was the belief that providing funds for students to attain a college degree would lead to a more educated citizenry and improve the economic status of those who used their degrees for better employment opportunities (Rogers, 2005; U.S. Department of Education, 2010). Much like her dissertation mentor, Laura Perna (1998), Kimberly Rogers (2005) makes this relationship between degree attainment and benefit to society clear in her research on the topic:

"One of President Johnson's Great Society programs, the HEA was based on the economic rationale that higher education would lead to better jobs, higher wages, and less poverty. This has indeed proven true. Over the last few decades, many researchers (Bowen, 1977; Institute of Higher Education Policy, 1998; Becker, 1992; Mortenson, 1999; Leslie & Brinkman, 1988) have correlated postsecondary education with higher salaries, greater productivity, increased consumption, better health, more civic engagement, decreased rates of unemployment and crime, and a decreased reliance on government financial support, such as Medicaid, Food Stamps, and Temporary Aid to Needy Families (TANF)," (Rogers, 2005, p. 4).

In the late 1960s, financial aid began to get more recognition as a viable means to achieve student dreams of success, and management of financial aid programs began to be recognized as a profession for those who administrated the various federal financial aid programs at colleges and universities (Brooks & NASFAA, 1986). For a number of years, these financial aid programs were operated by college and university bursars' offices, but gradually the need for a separate office was realized. In 1966, the creation of the National Student Aid Council recognized the field of student aid as a profession in its own right (Brooks & NASFAA, 1986). This council later grew into the National Association of Student Financial Aid Administrators (NASFAA). This association plays an advocacy role for the profession of financial aid (Brooks & NASFAA, 1986). The federal government also became gradually more involved in student loan programs during the era of the 1950's.

FFELP Stafford Loans

The Higher Education Act (HEA) of 1965 produced a program of federal

subsidized student loans that later became the Federal Family of Educational Loan

(FFELP) program (Parisi, 2008). Today, the FFELP program includes Robert Stafford

subsidized and unsubsidized loans for undergraduates with the student as borrower,

parent PLUS loans, which parents borrow on behalf of their undergraduate student, and

the Grad PLUS loans which graduate students may borrow for post-baccalaureate

endeavors (Federal Student Financial Aid Handbook, 2009). The loans provided to

students and their families under FFELP are processed by the school with funds offered

through individual lenders and financial institutions. A loan servicing agency usually

guarantees the loans and provides repayment services. Students have a six-month grace

period from the time they are not enrolled at least half-time before they begin to receive

repayment bills (Federal Student Financial Aid Handbook, 2009). It is this Stafford, or

FFELP, program of loans that the current researcher intends to analyze in this study.

Federal Direct Loans

FFELP Stafford loan program expired and was replaced by the pre-existing

Ford Federal Direct Stafford loan program when the Higher Education Opportunity Act

(HEOA) of 2009 went into effect July 1st, 2010. Under the Ford Federal Direct Loan

program, which has been running simultaneously with the FFELP Stafford loan

program during the past decade, the school processes the loan with funds provided

directly from the federal government (U.S. Department of Education, 2010). Students

then repay the loan directly to the U.S. Department of Education once they are out of

school for six months, similar to the FFELP Stafford loans (Federal Student Financial

Aid Handbook, 2009). The subsidized and unsubsidized interest rates for these two

programs are identical each year, and they each charge the same origination, default and

servicing fees.

Federal Funding Updates for Higher Education/Community Colleges

The four decades since the 1960's have witnessed a congress that is very

actively involved in the formation and structure of financial aid programming and

financial support of higher education based on the number of legislative bills they have

passed.

1980 Reauthorization of the Higher Education Act. In 1980, the Reauthorization

of the Higher Education Act renamed the Basic Education Opportunity Grant (BEOG)

after Senator Pell from Rhode Island. It was hereafter known as the Pell Grant. This

reauthorization also established Parent PLUS loans, which enabled a parent to borrow a

federal loan on behalf of their child as long as the student was enrolled at least half-time

(Federal Student Financial Aid Handbook, 2009). The Educational Amendments of

1980 changed interest rates on loans and redefined 'independent student.'

1980-1981 Omnibus Budget Reconciliation Act. In 1981, congress limited

subsidized loans to students whose family income was under $30,000 (U.S. Department

of Education, 2010). This act also added an origination fee for federal loans that is

extracted from the amount requested and is paid directly to the lender. This change to

need-based criteria for receiving subsidized loans pertains directly to the current study

because of the 'unmet need' variable in the current study. This law has been changed

considerably since then with more recent reauthorizations of the Higher Education Act.

1985 Balanced Budget and Emerging Deficit Control Act. In 1985, the Balanced

Budget and Emerging Deficit Control Act scaled down the amounts of aid students

could receive (U.S. Department of Education, 2010). This act was also known as the

Gramm-Rudman-Hollings Act because of its three sponsoring senators. The goal of the

Balanced Budget and Emerging Deficit Control Act of 1985 was to limit the souring

federal deficit of $200 billion and bring it to zero in 1991.

1986 Higher Education Amendments. In 1986, the Higher Education

Amendments of 1986 created a time limit on how long students could receive federal

Pell Grants – nine years to achieve a four-year degree (Federal Student Financial Aid

Handbook, 2009). According to interviews with practitioners in the financial aid field,

there are students who continue to remain enrolled long after their degree requirements

are met, simply to continue receiving financial aid (SASFAA, 2010). This HEA also

authorized financial aid administrators to use professional judgment in case of

individual student eligibility and renamed the National Student Loan Program the

Perkins Loan Program after Congressman Carl D. Perkins (Brooks & NASFAA, 1986).

1988-1989. In 1988, congress passed the *Supplemental Loans to Students*

Reform Bill. Legislature at this time was seeking to regulate the spending on federal

financial aid programs (U.S. Department of Education, 2010). In 1989, congress passed

the *Student Loan Reconciliation Amendments* (U.S. Department of Education, 2010).

With the passage of these bills, policy manuals changed for financial aid offices as they

adjusted their award packaging to reflect the changes to loan amounts students could receive.

1990 Omnibus Budget Reconciliation Act. In 1990, congress passed the Omnibus Budget Reconciliation Act. This act created the stipulation that federal financial aid would not be available at institutions that had too high of a default rate (U.S. Department of Education, 2010). A version of this requirement is still in effect today and this is the main reason many community college presidents are unwilling to offer loan programs at their institutions, because they risk losing permission to offer Pell grants or a federal loan program if too many (25 percent) of their students default.

1992 Higher Education Amendments. In 1992, congress passed the Higher Education Amendments of 1992: The act created the use of one application for all federal aid, the Free Application for Federal Student Aid (FAFSA). This act initiated the federal need analysis which used a single need analysis methodology (U.S. Department of Education, 2010). More pertinent to the present research, it also mandated the standardization of FFEL loan application forms, deferments, promissory notes, and lender and guarantor processing methods and named the program for Senator Robert Stafford (Vaughan, 2000). The act allowed both the annual and aggregate loan limits to increase and for parent PLUS loans to be limited only by the cost of attendance at the institution (U.S. Department of Education, 2010). This act also initiated the William D. Ford Federal Direct Loan Program which is very similar to the FFEL program, but uses only the U.S. Department of Education as a lender rather than banks and other financial agencies.

1993 Student Loan Reform Act. In 1993, congress passed the Student Loan Reform Act of 1993, so the Federal Family Education Loan Program (FFELP) would be in compliance with the William D. Ford Federal Direct Loan Program (U.S. Department of Education, 2010). Since then, the two loan programs have operated side-by-side with the same interest rates, repayment options, and laws applying to both. In March 2010, a bill (SAFRA) went before Congress to delete the FFELP program and have only the William D. Ford Federal Direct loan program and SAFRA was approved.

1998 Higher Education Amendments. In 1998, congress passed the Higher Education Amendments of 1998 increasing Pell grant amounts, but tying more accountability measures to the schools via loan default rate scores. When President William Clinton signed this bill (P.L. #105-244) on October 7, 1998 the following occurred: (1) The federal Pell grant amounts increased; (2) Schools that lose eligibility to offer federal loans because of their loan default score are not allowed to offer any federal grants either; (3) Students preparing to teach following baccalaureate achievement can still qualify for Pell grants; and (4) Student eligibility for aid expanded due to income protection allowances (U.S. Department of Education, 2010). All of these laws with increasing Pell amounts, changing eligibility criteria, and school accountability for loan default rates come into the forefront in the current research on Pell grants, Stafford Loans, and unmet need in relation to student retention.

1998 Carl D. Perkins Vocational-Technical Education Act Reauthorization. The Perkins Act, or Vocational-Technical Education Act Reauthorization demonstrated a serious commitment of federal funds to vocational education pursuits. The passage of this act was a boon for community colleges because, "Community colleges are

considered important providers of postsecondary vocational education," and many of them are allotted Perkins funds (Vaughan, 2000, p. 37). This reauthorization took away the stipulations for allotting funds to special populations and allowed the states the discretion of where and how to expend the Perkins funds (Vaughan, 2000). The Perkins funds continue to be an important funding stream for community colleges today.

Higher Education Reconciliation Act of 2005. This act, which was part of the Deficit Reduction Act of 2005, reduced 12.7 billion from student aid. The maximum Pell grant was held to $4050 (U.S. Department of Education, 2010). The Stafford unsubsidized interest rate was fixed at 6.8 percent and the Parent PLUS interest rate at 8.5 percent, which will remain the same until the new PLUS rate of 7.9 percent starts on July 1st, 2010 (Federal Student Financial Aid Handbook, 2009).

2008-2010. Legislature for financial aid programming has continued up to the present College Cost Reduction and Continued Access Act (CCRCAA) of 2008 and the HEA's of 2008 and 2009 (U. S. Department of Education, 2008). The CCRCAA went into effect July 1st, 2008 with the following loan stipulations; 1) Federal loans are not erased by filing bankruptcy, 2) Interest rates for subsidized loans changed to 5.6 percent, 3) Schools are required to offer loan entrance and exit counseling, and 4) Student borrowers of every age and category were allowed to borrow an additional 2,000 dollars per year (U. S. Department of Education, 2008). The U.S. Department of Education continues to monitor the financial aid systems and the recipients of aid in terms of amounts awarded (Spellings, 2006). The above updates conclude the brief history of federal financial aid.

Obviously there is a gap in current empirical research on financial aid award amounts and student retention and/or graduation that merits investigation. There have been several studies on both financial aid and student retention, usually at four-year schools. These data relating to retention will be analyzed in a later section of the literature review. Research related to financial aid will be synthesized in the next section.

Recent Studies of Financial Aid

As the previous background history of federal financial aid portrayed, this area of higher education research is still a relatively young field of study compared to some social sciences. Nevertheless, progressively more research, i.e. journal articles and doctoral dissertations, are being conducted on the topic (Olivas, 1985; Advisory Commission on Student Financial Aid, 2002; Heller, 2003b; The Pell Institute, 2004; Rogers, 2005; Wilkerson; 2005; Pekow, 2006; Rothstein & Rouse, 2007; Tierney, Sallee, & Venegas, 2007; Parisi, 2008; Roderick, Nagaoka, Coca, & Moeller, 2008; Villarreal, 2008; Wang; 2008). What follows is a linear examination of the recent studies on financial aid packaging, policy, grant studies and loan studies.

In *The Journal of Higher Education* article by Olivas, the ideology and practical application of financial aid packaging were addressed (1985). Olivas found that although packaging policy (defined as how financial aid directors decide the amounts and types of financial aid to award) is of extreme importance to the administration of an aid program, "scant attention has been paid to the economic, equity or policy dimensions of packaging (1985, p. 462). Olivas (1985) was particularly displeased with

the packaging policies at community colleges because there were only one or two types of aid and he believed multiple types of aid in packaging ruled out vulnerability to federal policy changes. Nevertheless, Olivas concluded on a positive note, "the federal campus-based programs are an exception to the general unwieldiness of most programs of financial aid and thus may represent an important tool that can be employed to promote persistence" (1985, p. 66). The packaging plan for amounts and types of aid at each school is ultimately left to the discretion of the Financial Aid Director, with approval granted annually from the state certification office. Consequently, the proposed research may shed new light on the most effective amounts and types of aid to offer students to ensure their continued access to higher education.

In 2002, the Advisory Commission on Student Financial Aid (ACSFA) was commissioned by Congress to conduct a report on the status of student financial assistance. *Empty Promises: The Myth of College Access in America*, states the fact that many qualified young people (43 percent) do not enter a four-year college within two years of completing high school and some (16 percent) never attempt college at all because of prohibitive costs (2002, p. 25). At the time this report was published, federal financial aid was budgeted for $60 billion a year, only 12 billion of which was for critical grant programs (Advisory Commission on Student Financial Aid, 2002, p. 1). It was the strong conclusion and recommendation of the ACSFA report that the federal government should increase amounts of need-based grant aid (Pell):

> ...that will enable students to persist by reducing work and loan burden, and
> successful campus academic and support strategies that enhance the likelihood
> of persistence. Proposals that trade-off access for persistence, or vice versa, are

shortsighted and ultimately shortchange the very students whom Title IV serves (2002, p. 37).

Of course, the purchasing power of the Pell grant is greater at public two-year and community colleges where tuition rates are significantly lower than for public or private four-year institutions (Heller, 2003b). Since the ACSFA report was published, congress increased the maximum Pell grant from $5,350 in fall 2009-spring 2010 to the scheduled $5,550 for fall 2010-spring 2011. For the academic year 2008, tuition at the community college in this study was $82 per credit, while the tuition at the state's flagship institution was more than $300 per credit the same year. Consequently, a student receiving a full Pell grant for $4,731, with a full 24-credit tuition bill for the year totaling $1,968 received $2,763 in refund checks for textbooks and education expenses. Thus, we see the Pell grant meeting the costs of education at the two-year school level, but this grant may not cover university level tuition costs.

The Pell grant program has been well-studied by many others as well as by *The Pell Institute* itself (The Pell Institute, 2004). In the majority of studies related to federal financial aid and the Pell grant program, the conclusion and recommendations are predictable – increase grant aid and allow students to lower the amounts of loans they borrow (Rothstein & Rouse, 2007; Tierney, et al, 2007; Roderick, et al, 2008; Rogers, 2005). The current researcher concurs with these previous studies on financial aid which concluded that increasing the debt burden for community college students is not conducive to their successful graduation. If, on the other hand, the amounts of grants were to increase such that students would not need to borrow loan funds, the authors predict higher student retention rates (The Pell Institute, 2004).

Financial aid and essential access to college are linked for the American-Indian students (Tierney, et al, 2007). In fact, this researcher found any student, American-Indian or not, without financial assistance will not be as likely to take part in higher education (Tierney, et al, 2007). It follows that individuals barred from participation in higher education for financial reasons will be disadvantaged when participating in the greater civic good of others. "A post-secondary degree does not simply benefit the individuals who have achieved a degree; the federal, state and tribal government is improved by a well-educated public" (Tierney, et al, 2007, p. 22).

More timely and useful financial aid information and advice disseminated among the American Indians who would apply for aid and go to college, will enable the nation to achieve its goal of a well-educated populace (Tierney, et al, 2007). The researchers in the following section have published similar findings – students must have timely information about the financial aid process. Perhaps if more people were aware of the existence of financial aid availability and average amounts of aid awarded, more people would apply to college and pursue their dreams.

The University of Chicago Consortium on Chicago School Research, *From high school to the future: Potholes on the road to college*, mentions not filing a FAFSA as one of the potholes for a student's successful road trip through college (Roderick, et al, 2008). The authors stated that applying for financial aid is a daunting task for low-income students, but is one of their most important steps on the road to college so they do not end up paying more for college by not applying for aid at all (Roderick, et al, 2008). Students who are not aware of federal financial aid fall prey to private loan

agencies and end up paying interest rates that are a reflection of their credit scores rather than fixed low-interest federal loans. In fact, the authors of this study found: Students who reported completing a FAFSA by May and [who] had been accepted into a four-year college were more than 50 percent more likely to enroll than students who had not completed a FAFSA. "This strong association holds even after we control for differences in students' qualifications, family background and neighborhood characteristics, and support from teachers, counselors, and parents" (Roderick, et al, 2008, p. 4).

Consequently, there may be a positive link between access and financial aid as well as between financial aid and retention. In a working paper from the *MacArthur Network on Transitions to Adulthood*, Rothstein & Rouse (2007) found that students with no loan debt were more likely to find and work at the job of their choice regardless of remuneration, whereas students with debt were more likely to seek higher paying employment regardless of job fit or satisfaction. So students felt pressure from loan debt to seek the higher salaried jobs whether or not they wanted to perform in those types of employment categories, rather than pursue their dream career; therefore, these students were truly 'Constrained after College,' (Rothstein & Rouse, 2007)

The 1993-1994 and 2003-2004 *National Postsecondary Student Aid Surveys* (NPSAS) revealed that the average four-year graduate's loan debt in 1993 was $8,462, but in 2004 it was $13,275. In a more recent report by the National Center for Education Statistics, "Overall, 52 percent of students attending college in their own state attended public community college," (Pekow, 2006). The students in this report, "Undergraduate Financial Aid Estimates for 12 States: 2003-04" refer to full-time full-year students

paying in-state tuition at public two-year colleges in 2003-2004. Of these students, "Sixty percent of all undergraduates received student aid, averaging about $6,600...Almost half - 49 percent - received grants and 30 percent received loans" (Pekow, 2006). The average debt for currently borrowing students at the community college that is the basis for the current study is $7,160 mid-way through their degree programs (Institutional Data, 2005-2009). The 407 students, who borrowed loans for fall 2008 and spring 2009, previously carried a total debt load in excess of 2.9 million dollars, but much of it was from borrowing at other higher education institutions before enrolling at this community college. If these students continue to borrow at their current levels per year, they will average $14,320 in debt at the culmination of their two-year degrees or upon their separation date from the college should they cease attending without achieving a degree.

Brief History of Retention Theory

College student retention theories have been well-studied (Chickering; 1969; Astin, 1977; Bean, 1990; Pascarella & Tenrenzini, 1991; Tinto, 1994; Robotham & Julian, 2006; St. John, 2006). There are many theories, which attempt to explain why some students graduate and why others do not (Reisman, 1998; Altbach, Gumport, & Johnstone, Eds., 2001). Much of the retention research focuses on the individual characteristics of the students (Bean, 1990; Pascarella & Tenrenzini, 1991; Tinto, 1993; Tinto, 1999). Conversely, some studies of retention theory emphasize institutional interventions and approaches to enrollment management (Knefelkamp, Widick, Parker, & Associates, 1978; Kuh, Kinzie, Schuh, & Whit, 2005; St. John, 2006). Categorically, retention theory can be grouped into two ideological models. The two major ideological

camps for retention theories are Tinto's student departure model and Astin's student involvement model.

Tinto's Student Departure Model

Vincent Tinto is the father of retention research. Tinto's model hypothesizes that the more students engage in their academic and social environment, the more likely they are to be retained through graduation (Tinto, 1993; Wilmer, 2009). Throughout the course of Tinto's research on student retention his emphasis was on student characteristics and student environmental factors for departure. "Tinto recognized that as students enter college they are characterized by a host of variables including previous background, expectations, goal commitments, and institutional commitments and that these characteristics, along with the quality of social and academic interactions on campus, ultimately determine persistence" (Haplin, 1990; Wilmer, 2009).

Tinto examines the reasons students fail to graduate, with a parallel to social engagement theory. With his early retention research, Tinto compared the exit from the academic arena of higher education to the exit of a person from their personal social circle of friends and family via suicide (Tinto, 1993). Unlike past researchers on student retention, which included only students enrolled at four year institutions, Tinto conducted several studies with a community college student population (Seattle Central Community College and LaGuardia Community College). It was during these studies, Tinto discovered for many busy, working, commuter community college students the time spent in the classroom was the only opportunity for social interactions to occur that

could assist in creating engagement and retaining students (Tinto & Russo, 1994; Tinto & Love, 1995).

Later in his retention research, Tinto acknowledges it is possible that finances could play a role in a student's decision to leave an institution (Tinto, 1999). In was in this later study, that Tinto examined the key role of the first year of college and the importance of the initial scholastic experience in terms of retention impact (1999). Ultimately, Tinto's contributions to student retention research were founded on the premise students bring certain characteristics with them into their academic experience, but he discovered it is the subsequent environmental events, such as having financial support, socially connecting with other students, and grasping the academic material that will result in departure or graduation for the community college student (Tinto & Russo, 1994; Tinto & Love, 1995).

In the current study, Tinto's theoretical premise that financial support may affect student retention will be evaluated. In addition, academic aspects for the students in this study will also be addressed employing their GPA scores and year in school. Consequently, Tinto's student departure model serves as one of the foundational theoretical constructs for the proposed study on student retention.

Astin's Student Involvement Model

Alexander Astin's theory of student retention focused on student involvement as an explanation of student development and retention (Bean, 1990; Astin, 1993; Wilmer, 2009). Primarily a proponent of student development, Astin formulated his theory of student involvement as a model of explanation for environmental effects that affect

student development and retention. Astin defined student involvement as "the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1999b, p. 518). Therefore the level of student learning and development are in proportion to the level of student investment in their academic program in terms of time and attention. Astin also postulated that measure of success for an educational policy or program should be based on its capacity for student involvement because he did not believe exposure to information alone was adequate (1999b). He asserted that the student becomes an active learner. Fundamentally, Astin's theory dealt with *how* the student develops and the effects that this development has on the student's long-term retention (Astin, 1999b).

In his longitudinal study on retention, *Preventing Students from Dropping Out,* Astin found that all the factors that positively influenced retention could be explained by his involvement theory, whereas the aspects that influenced loss of student enrollment were the results of lack of involvement (Astin, 1975). He later discovered in his study, *What Matters in College*, that academic involvement, student-faculty involvement, and peer involvement are the three most important types of participation (Astin, 1993). Other student involvement studies, such as Kuh, Kinzi, Schuh, & Whitt's Assessing *Conditions to Enhance Educational Effectiveness: The Inventory for Student Engagement and Success*, support Astin's theory (Kuh, et al, 2005).

These authors fail to acknowledge the vital impact that financial funding of a student's education can have on individual students. For example, if a student has to work 40 plus hours per week to provide the essentials for their family's needs and also to cover their tuition, textbook, and transportation costs, that student may be too

exhausted to be 'involved' and remain enrolled. Whereas, a student who does not have to worry about finances because their parents pay all their college expenses (or federal financial aid covers all their expenses) may have more time to devote to academic and extracurricular engagement.

Student Centered Retention Factors. Students pass through psychosocial stages in their developmental paths through the educational process. These stages include, developing competence, managing emotions, developing autonomy, establishing identity, freeing interpersonal relationships, developing purpose and developing integrity (Chickering, 1969; Knefelkamp, Widick, Parker, & Associates, 1978). As students interact with different parts of their educational environments, they develop as scholars (Knefelkamp, et al, 1978). There are six main ways in which Chickering thought higher education institutions affected student development leading to graduation (Knefelkamp, et al., 1978, pp. 25-26). Astin and others were concerned about retention and what types of students, based on specific characteristics and behavior, were likely to leave the institution (Astin, 1991; Astin, 1993; Kuh, Kinzie, Schuh, & Whitt, 2005; St. John, 2006), but these scholars of student-centered retention theory did not acknowledge financial need as a reason students might leave college. What is missing from these theories of student retention is the influence of economic need as a correlate to attrition.

Economic Persistence Theory

While the present study acknowledges the contributions of the previous different theoretical constructs to the understanding of the retention of college students, the current research draws on the theoretical constructs of economic persistence theory – a distant cousin to Tinto's student departure model theory. As a proponent of environmental factors effecting student departure, economic persistence theory and related theories cover several areas of research including the topic of this study – the impact of financial aid on student retention.

Economic persistence theory finds foundational support in Abram Maslow's hierarchy of needs. There are five different levels in Maslow's hierarchy of needs model – the more fundamental needs at the bottom, culminating in self-actualization such as degree attainment at the point of the pyramid. The first needs are physiological such as the need for water, air, food and sleep. Maslow posited that all of the other four types of needs were a distant second until these essentials were met. The second need is for security and the third need is for social interaction. If students' basic needs of shelter, food and warmth are not being met due to a lack of finances, they may be too worried, distracted, etc., to concentrate on their coursework.

The lack of fiscal support and the pressing economic need to work are keeping college students from earning degrees or certificates (American Association of Community Colleges, February/March 2010). A recent Public Agenda survey entitled, "With Their Whole Lives Ahead of Them," included 600 young adults aged 22-30 who were asked to list their greatest obstacles keeping them from graduation. "Fifty-six percent of the respondents listed the need to work full time as a major impediment

preventing them from returning to school, (AACC, February/March 2010, p. 8). Of the survey respondents, "Fifty-eight percent did not receive financial support from parents or relatives and 69 percent did not receive financial support from scholarships or other financial aid," (AACC, February/March 2010).

According to Heller, in *Informing public policy: Financial aid and student persistence,* if students were to cease working and demonstrate lower incomes, they would qualify for higher amounts of federal aid, a fact that may escape public policy makers (Heller, 2003a). Heller's study used data from the U.S. Department of Education to examine the characteristics of grant recipients to see if the use of grants has changed over the years and whether institutional and state awards are related to student persistence and degree attainment. Bivariate and multivariate statistical methods were employed in this study, which controlled for demographic, academic, institutional, and college cost factors included in the models. The results validated previous research on retention, supporting academic factors as a strong predictor of student retention to graduation and degree attainment (Heller, 2003a). Heller also found economic and funding links to students making their way to certificate or degree completion.

Institutional grants have also been found to relate to persistence and degree attainment – these are grants that do not have to be repaid and are usually funded by donors. "Students who received an institutional need-based grant of $1,200 in their first year of college (the average grant award) were 6 percentage points more likely to persist into their second year than were students who did not receive an institutional need-based award" (Heller, 2003a). Heller also found that the timing (early on) of the grant awards can make a difference for student retention (Heller, 2003a).

General Retention Predictors

In analyzing retention theory, most measures of retention use a student's graduation as the ultimate measure and continuation from one grade level to the next as an annual marker measure (Tinto, 1994; Robotham & Julian, 2006). In addition to satisfaction with the institution, the literature also suggests a variety of other predictors and detractors for the persistent problem of student retention (Dowd & Coury, 2006; Harrison, 2007; Hermanowicz, 2006; Tinto, 1994). These factors include students' financial aid identifiers, academic, motivational, and emotional problems of at-risk students, pre-freshman summer orientation, and part-time faculty versus full-time faculty as primary instructor. Each factor is discussed as it relates positively or negatively to retention.

Positive first-year experience. Harrison (2007) conducted a telephone survey on the impact of negative experiences and dissatisfaction with the first undergraduate year for 151 freshmen who withdrew. He concluded that the negative stimuli of "course choice, academic experience, socialization, and finances only partially explain withdrawal" (Harrison, 2007, p. 377).

Pre-freshman orientation. Berkovitz & O'Quinn's (2006) studied 16 predictors for graduation focusing on orientation as a successful intervention for retaining students. They discovered two significant interventions for students who had returned after a stop out: "Students who had been academically dismissed were less likely to graduate and those who participated in a pre-freshman summer orientation program were more likely to graduate" (Berkovitz & O'Quinn, 2006, p. 199).

Faculty impact. According to Stevenson, Buchanan, & Sharpe (2006) "the potential impact of one group – faculty – on student success far outweighs all others" (p. 141). The authors posited that student success is dependent on both persistence to graduation and mastery of academic content and that the faculty influence whether students learn the course content (Stevenson, Buchanan, & Sharpe, 2006). Again, if students are unable to find time to interact with faculty due to the economic need to work, faculty will not have the opportunity to influence them at all.

Financial aid factors. Dowd & Coury's (2006) study of 694 two-year college students revealed that taking out student loans did not contribute to retention and degree attainment. Rather, Dowd & Coury (2006) found loans negatively impacted persistence and had no effect on matriculation. In a comparable longitudinal study of 21,243 students, Wessel, Bell, McPherson, Costello, & Jones (2006) found as hypothesized that "Students who had greater financial need disqualified at higher rates and persisted to graduation at lower rates" (p. 185). Wessel, et al, used "academic ability" and "receiving financial aid" as two of their retention predictors for their study. However, unlike Dowd & Coury, Wessel, et al, (2006) found that academic ability indicated retention to graduation better than financial aid category.

Studies Combining, Retention, Financial Aid, and Community Colleges

The research on financial aid and retention is not robust, but there have been a modest number of empirical studies of financial aid and student impact over the last two decades (St. John, 1992; Perna , 1998; Tinto, 2004; St. John, Paulson, & Carter, 2005; Wessel, Bell, McPherson, Costello, & Jones, November 2006). Many of the studies were

conducted at four-year institutions, but offer valid insights on various aspects of financial aid and retention. Each of the contributions of these scholars will be addressed in reference to the proposed study on retention and financial aid.

It would be of practical interest for colleges to conduct well-designed and well-implemented research on the effects of student financial aid (St. John, 1992; Perna, 1998). St. John (1992) suggested that institutional research on the impact of student financial aid would dispel ambiguities about financial aid policy and produce useful data for institutional financial planning. For example, some findings indicated that receiving financial aid may not be directly related to graduating within the five years (Perna, 1998).

Research shows that the type (loans, grants, and/or work study) and amount of financial aid makes different impacts on retention. Perna (1998) used descriptive statistics and path analysis on the types and combinations of aid with a sub-sample of 3,188 full-time students at a four-year institution to see if they attained a degree within five years. The results of Perna's (1998) study suggest that grant-only and work study financial aid packages have more positive direct effect on retention than loans. The findings in reference to work-study also support the retention premise that students who are engaged on their campus, for whatever reason, are more likely to persist. The author found student borrowers less likely to graduate within five years than non-financial aid recipients (Perna, 1998). This study has implications for the current research because of the negative effect of loans upon student persistence.

In 2004, 46 percent of low-income students who graduated from high school, immediately enrolled in higher education institutions, but many of these students were first-generation students and had no parental support as they pursued a college degree

(Tinto, 2004). As an authority on retention matters, Tinto's *Occasional Paper for the Pell Institute for the Study of Opportunity in Higher Education* offered realistic insight based on years of retention research on how to enable these disadvantaged students to persist and the most important item on his list was financial aid. His pragmatic advice was to offer amounts and forms of financial support that would allow low-income students to attend full-time and work fewer hours and on campus, if possible (Tinto, 2004).

Some retention research focused on the recurring issues of college costs, diversity, financial aid and persistence. St. John, Paulsen, and Carter (2005) addressed the rising costs of college attendance. This study examined the amounts of grants in relation to actual college costs and compared African American and white student persistence rates. African Americans were more adversely affected by grant inadequacy than Whites were and these findings support the argument that the historical decline in federal grants was a contributing factor to the gap in postsecondary opportunity that opened after 1980 (St. John, Paulsen, & Carter, 2005).

The proposed research addresses unmet need for students. Students who have greater financial need disqualify at higher rates and persist to graduation at lower rates according to a study of 21,243 students (Wessel, Bell, McPherson, Costello, & Jones, 2006). The authors of this longitudinal study analyzed academic ability of students and financial aid category for students in relationship to academic disqualification versus persistence (Wessel, et al, 2006). When financial aid categories for students were stratified by academic ability, the authors found academic ability was more strongly indicative of academic disqualification or persistence to graduation than was the category

of financial aid alone (Wessel, et al, 2006). As with many of these studies, these findings may assist institutions in determining when financial intervention and academic intervention programs may be most appropriate.

Since the 2006 study by Wessel, et al, there has been only a trickle of research combining the topics of financial aid and retention. In 2007, however, Jacob Gross, Don Hossler, and Mary Ziskin conducted another four-year study on the effects of institutional financial aid and student persistence. Their research employed data from a statewide student database, and a cohort of first-time, first-year students to determine the effects of institutional financial aid on year-to-year persistence at three large, public universities (Gross, Hossler, & Ziskin, 2007).

This study is very similar to the proposed research on year-to-year retention for community college students in that it studied the effects of financial aid using logistic regression models. The researchers found that institutional financial aid had a positive but modest effect on persisting…"Interestingly, the effects of aid were greater for men than for women, all else being equal," (Gross, Hossler, & Ziskin, 2007). The study concluded with the sense that while they had some positive findings for financial aid and persisting, the relationship of those findings was not strong enough to validate financial aid as the only reason for persisting (Gross, Hossler, & Ziskin, 2007).

In her 2008 doctoral dissertation, Wagner studied recipients of state aid in the form of LIFE scholarships and first-to-second year persistence decisions and came to the same conclusion after discovering that students who had the academic ability to keep up their GPA and keep the merit-based aid were more likely to persist (Wagner, 2008). In the course of her work in student affairs, Wagner (2008) found that practitioners are often

tasked with the responsibility for reducing rates of student departure and, "One such environmental force that has an impact on student persistence is financial aid." Wagner (2008) developed three logistic regression models to predict the probability of retaining LIFE scholarship recipients at a South Carolina university to the year-end of the first year of receiving the scholarship, the probability of returning for a second year of enrollment after losing the scholarship aid, and the probability of regaining the LIFE scholarship by year-end of the second enrollment. The author used student data for:

> First-time, full-time South Carolina residents (N=1,743) who 1) were admitted for the fall 2004 semester, 2) were admitted to a baccalaureate degree-granting program, 3) received the LIFE Scholarship during the first semester of enrollment and 4) enrolled at the institution for the fall 2004 term and persisted through the end of the spring 2006 term (Wagner, 2008).

Wagner's results indicated that all three models hold potential for guiding institutional retention initiatives among LIFE Scholars (Wagner, 2008). The more knowledge we can collectively accumulate about forces that impact student persistence, the more likely we are to develop preventative strategies that can improve student retention rates.

Conclusion

The present research, which investigates the relationship of financial aid awards (of Pell grants and Stafford loans) of community college students to the retention and graduation of these students, is similar to a study by Rogers (2005). Rogers used multiple linear regression models to study low-income and adult learners receiving financial aid and their retention to graduation. In her doctoral dissertation, "How much

does money matter? An examination of the impact of financial aid programs on the sub-baccalaureate degree and certificate attainment of low-income students and adult learners," the author focused on students of a certain age group and in certain income categories. Rogers' premise was that money mattered to the extent that students would not go to college or remain enrolled in college without adequate financial resources to remain in pursuit of a degree.

Rogers' logistic regression analyses suggest that, "the receipt of grant aid early in college has a significant positive effect on the sub-baccalaureate credentialing of both low-income students and adult learners," (Rogers, 2005, p. iii). Roger's discovered that low-income students, who received the Pell grant during the 1996 to 1997 academic year, were 81 percent more likely to obtain a college credential. During the same academic year, adult learners receiving Pell grants were 67 percent more likely to attain a sub-baccalaureate credential than non-recipients of the Pell grant (Rogers, 2005).

These are significant findings for the research arena of federal financial aid and for retention. However, Rogers states, "Little is known about how these federal, state, and institutional financial aid programs affect the educational outcomes of traditional and non-traditional students who seek associate degrees and other sub-baccalaureate credentials," (Rogers, 2005, p. 108). It is the intent of the current research to expand the knowledge base in regard to two-year degree seekers and the impact receipt of financial aid has for their lives.

In this chapter, the history of community colleges as a distinctive institution type was reviewed, followed by recent studies of community colleges, and concluding with retention studies. Next, the history of federal financial aid in the United States was

detailed, followed by a synopsis of recent financial aid policy and practice, and culminating in recent scholastic studies of financial aid and community colleges. The third and final theme presented in this chapter was retention theory, with general retention predictors examined by study type ending with the most recent studies of retention. The culmination of the literature review was a synthesis of recent studies combining all three topics of community colleges, financial aid, and retention.

CHAPTER 3

METHODOLOGY

> Despite a historical federal commitment to access to postsecondary education for qualified students though the use of financial aid, federal student aid policy has slowly moved toward issues of college choice, affordability, and accountability. The political and economic concerns of the 1980s and 1990s that pushed students into loans and away from grants and the weak targeting of federal policies show no sign of subsiding...Yet, little is known about how these federal...financial aid programs affect the educational outcomes of traditional and non-traditional students who seek associate degrees and other sub-baccalaureate credentials (Rogers, 2005, p. 107-108).

Restatement of the Problem

At present the federal government has no measure of the relationship between student aid dollars spent and student outcomes. This research will serve as an exploratory study of the relationship between the amounts and types of financial aid received, student unmet need, and student retention.

Research Design-Statistical Model

This study is a quantitative analysis of *ex post facto* (Tabachnick & Fidell, 2007) data of financial aid awards made in the fall semesters of 2008 and the spring semester of 2009. The study will attempt to discover whether the receipt of financial aid and unmet need are predictors of student retention by employing a *logistic regression* (Menard, 2002) statistical model to the types and amounts of the award compared to a dichotomous variable for retention after two semesters. Other demographic data, such as age, gender, ethnicity, GPA, year in school, and dependent or independent status,

will also be analyzed one by one with a logistic regression statistical model (Levin &

Fox, 2006) to see if demographics are related to retention as well.

In the majority of studies related to federal financial aid and the Pell grant

program, the conclusion and recommendations are predictable – increase grant aid and

allow students to lower the amounts of loans they borrow (Rothstein & Rouse, 2007;

Tierney, et al, 2007; Roderick, et al, 2008; Rogers, 2005). If, on the other hand, the

amount of grant funds available were to increase such that students would not need to

borrow loan funds, the authors predicted higher student retention rates (The Pell

Institute, 2004). The current researcher concurs with these previous studies on financial

aid which concluded that increasing the debt burden for community college students is

not conducive to their timely graduation. In actuality, students may be retained in

school longer to receive loans longer and to defer the repayment of those loans.

The researcher hypothesizes that there will be (1) a positive relationship

between the amount of financial aid grant awards and retention of that student in school,

with the variables set as dollar amounts for grants and retention measures as "yes"

retained at the end of two consecutive semesters – fall 2008 (baseline year) and those

same students again in spring 2009. Conversely, the researcher hypothesizes that there

will be (2) a positive relationship between the amount of financial aid loan awards and

student retention after two consecutive semesters and (3) a negative relationship

between the amount of unmet need for students and retention of those students after two

consecutive semesters.

The researcher further hypothesizes that (4) a relationship will not be found

between age, (5) gender, and (6) ethnicity and retention. In contrast, the researcher

posits that there will be a relationship between (7) GPA and (8) year in school (2nd year sophomore, etc) and retention. Finally, the researcher hypothesizes that there will not be a relationship between (9) status as independent or dependent and retention.

Research Methodology

Data Source

The financial aid amounts that were awarded to students enrolled at a small, southern, public, community college in the fall semester 2008, and spring 2009 were collected by running queries looking at individual student accounts who received federal aid funds (n = 1178). This data collection was administered with the permission of the Director of Financial Aid and the Office of Institutional Research, Planning, and Institutional Effectiveness (IRPIE) at the college. As a result, the research methodology was a non-experimental quantitative study of *ex post facto* data from a sample of convenience to which logistic regression analysis was applied (Tabachnick & Fidell, 2007).

Data selection. The participants for this study were students at a small, public community college in the southeastern U. S. who enrolled in both the fall 2008, and spring 2009 semesters and who received federal financial aid in the form of Pell grants and Stafford loans. The data set for this study included students who actually received disbursed federal financial aid in the form of Pell grants (n = 770), or Stafford loans (n = 408), or both.

Instrument. The Student Information System (PeopleSoft 8.9) software queries

available from the financial aid office at this small, southern, public, community college

were the instruments used to collect the data for this study. The researcher also accessed

the PeopleSoft Student Information System for each student account to assess if

retention had been achieved after two semesters and to manually calculate the amount

of unmet need left in each student budget after all aid had been disbursed.

All personal identifiers, such as name, social security number, date of birth, and

student ID number were excluded from the queries and students were known only as

case 1, case 2, etc. (After the data were collected, whether by queries or by manual

calculation of the student cost of attendance budgets, any identifiers, such as student ID

number or social security number were removed from the data sets and they were

analyzed anonymously.) Appendix A contains itemized definitions of all demographic

variables for this research. An example of the information sought in this study is

illustrated in Figure 1.

Figure 1. A financial aid case example for the study showing amounts of awards, types

of awards, and the dichotomous retention variable.

ID	Age	Gndr	Eth	GPA	Year	Status	Unmet need	Grants?	Loans?	Retention?
1	32	fml	wh	3.2	Sphmr	Indpnt	$2800	$750	$6300	No (6cr "W")

Variables. The example above clearly lists the student variables in this study

benchmarked at the start of the study in fall 2008, which include the following:

ID refers to the case number of each student in the sample, rather than actual student identification number to protect the identity of students;

Age is noted by year of birth for each student and measured in years.

Gender is indicated by whether the student answered this question on their application as female, male, or unknown;

Ethnicity refers to whether the student indicated on their application that he/she was White, Black, Hispanic, American Indian, Asian, Pacific Islands, other, or did not specify;

GPA or Grade Point Average is noted on a 0-4.0 scale, with all incoming freshman having a GPA of 0 at the college level;

Year, as a variable, indicates the student's grade level in college, as either freshman or sophomore at this particular community college;

Status refers to the federal financial aid requirements for considering the student as dependent or independent. Dependent status is defined for federal financial aid as students who are 23 years of age or younger and independent status is attained by qualifying as one of the following a) 24 years of age or older, b) married, c) a member of the military, d) an orphan or ward of the court, or e) financially providing for the needs of their own dependent children;

Unmet Need refers to the remaining fiscal need in a student's financial aid budget after deducting the Expected Family Contribution number from the FAFSA and then subtracting all financial aid funds received (See Appendix B for actual budgets);

Grant as a variable is defined as the federal Pell grant and is measured by dollar amount of Pell grants received in the fall and spring semesters together, since financial

aid amounts are awarded once for the year and offered in total before the academic year starts in the fall.

Loan as a variable is defined as the federal FFELP Stafford loan and is measured by dollar amount of Stafford Loans received in the fall and spring semesters together as one total for the award year.

Retention as a variable is defined by whether the student remained enrolled from the beginning of the fall 2008 semester through the end of the following spring 2009 semester and was measured by the number of completed credits for each semester. If a student successfully passed even one class with a passing grade of A, B, C, D, P, or S (but withdrew or failed several others) during the spring semester, the retention variable for the two semesters was scored dichotomously as "yes." If a student received only grades of "W" for withdrawn, that student's retention was measured dichotomously as "no." Furthermore, if a student completed credits for fall semester, but failed to enroll, or enrolled and then dropped all credits for spring semester, that student would also be coded as "no" for negative on the retention measure.

Data Analysis

The first analyses the researcher conducted in SPSS were descriptive statistics of each of the nine research variables. These descriptive statistics and frequencies will be reported for each of the demographic variables in order of their listing in the hypotheses.

Second, the Chi-square likelihood ratio test was also administered to each of the three dollar amount variables (grants, loans, and unmet need) and then to the

demographic variables (age, gender, ethnicity, GPA, year in school, and status as a

dependent or independent student.) Student retention was the dependent variable for

each of these likelihood ratio tests.

Maximum likelihood, the procedure for estimating coefficients was used in

order to find the best linear combination of predictors, and to maximize the likelihood

of obtaining the observed outcome frequencies. Goodness-of-fit tests were used to

develop the model that does the best job of prediction with the fewest predictors

(Tabachnick & Fidell, 2007, p. 439). For this research, the Chi-square likelihood ratio

test was:

(X (squared) = [(- 2 * [(log-likelihood for the restricted model) – (- 2 * log-   likelihood for the full model)]

Next, binary logistic regression analyses were conducted on all of the variables,

with the three main predictor variables (amount of Pell grants, amount of Stafford loans,

and amount of unmet need) in order to examine whether the amount of Pell grants,

amount of Stafford loans (for one academic award budget) and unmet need have a

predictive relationship to the dichotomous measure for retention (for one academic

year). Predictor variables were the amount of grants, amount of loans, the amount of

unmet need, and the dichotomous dependent variable was retention from fall-to-spring

semester.

Logistic regression was the logical choice for this type of research because it

allows prediction of group membership when predictors are continuous, discrete, or a

combination of the two (Tabachnick & Fidell, 2007, p. 24). The dependent variable in

this study, student retention, is measured dichotomously as "yes" or "no" so multiple

regression cannot be used because that would require interval data measurement. For

example, the study examines whether students will be in the 'retained' group or the 'not retained' group after a logistic regression model evaluates the odds of membership in one of these two groups, so this study was a classic application of logistic regression.

Finally, the model produced in logistic regression is nonlinear, thus the equations for outcomes are more complex than for multiple regression. In logistic regression the natural log of the probability of being in one group is divided by the probability of being in the other group. So this research utilized the following equation:

$$logit(p) = \ln\left[\frac{p}{1-p}\right]$$

Where p is the probability of presence of the characteristic of interest-for example: RETENTION. The logit transformation is defined as the logged odds:

$$odds = \frac{p}{1-p} = \frac{probability\ of\ presence\ of\ characteristic}{probability\ of\ absence\ of\ characteristic}$$

Operationalized definitions. According to the definitions for this study, a financial aid student is any student who received a financial aid award whether it was a Pell grant or a Stafford loan. In this study, "grants" refer to both federal Pell grants and the SEOG or "supplemental" Pell grant. State grants which the college in the study awards, such as the Commonwealth of Virginia grant, CSAP, VGAP, HETAP, and PTAP grants will not be analyzed in this study because the study focused only on federally funded financial aid. In this study, "loans" refer to federal Stafford loans which are part of the Federal Family of Educational Loans Program (FFELP). Parent PLUS loans are also part of the FFELP program, but they will not be analyzed in this

study because this study focused on student financial aid recipients, not parent financial

aid recipients. In addition, many of the borrowers at the community college under

analysis may not have parents that would want to take out parent PLUS loans or would

be likely to be approved for PLUS loans.

Statistical procedures listed by hypotheses. SPSS software will be used to process

the data for this study. Logistic regression is the appropriate statistical procedure for

testing these hypotheses because it describes the relationships between a categorical

outcome variable (student retention) and one or more categorical or continuous

predictor variables (i.e. amount grants 3,000, amount loans 5,000) (Peng, Lee, &

Ingersoll, 2002). When evaluating the goodness-of-fit of the logistic model in SPSS

software, the Cox and Snell R^2 and Nagelkerke R^2 will be evaluated (Pampel, 2000, p.

53). Specifically, the significance of the coefficient, or the likelihood that the coefficient

in the sample could have occurred by chance alone, will then be interpreted. The

following statistical analyses will be conducted for each hypothesis because of the

number and the dichotomous nature of some of the variables, i.e., student retention

(Orcher, 2005).

Hypothesis 1: *There is a positive significant relationship between Pell grant*

award amount and student retention from fall-to-spring. The predictor variables are

dollar amount of Pell grants and the criterion variable is retention. A logistic regression

model utilizing the predictor variables was conducted for Hypotheses 1 measuring

retention dichotomously as discussed in the definitions section. The maximum

likelihood and goodness-of-fit criteria were used on this hypothesis also to determine the validity of the model.

Hypothesis 2: *There is a positive significant relationship between Stafford loans amount and student retention from fall-to-spring.* The researcher proposed that the more deeply students become indebted, the more likely they are to be retained to avoid repayment. A logistic regression model utilizing the predictor variable, dollar of annual loan amount, and the criterion, retention-measured dichotomously, were conducted for Hypothesis 2.

Hypothesis 3: *There is a negative significant relationship between unmet need amount in the student's financial aid budget and that student's retention from fall-to-spring.* The researcher posited that the more unmet need students have the less likely they are to be retained because of the economic situation of the family. A logistic regression model utilizing the predictor variable, unmet need, and the criterion, retention-again measured dichotomously was conducted for Hypothesis 3. This last group of hypotheses (4 through 9) pertains to background demographics which may influence retention and were studied with a logistic regression model as well to see if there was a significant relationship between any of these items and student retention.

Hypothesis 4: *A significant relationship will not be found between age and retention.* A logistic regression model was conducted for this continuous predictor and the criterion, student retention.

Hypothesis 5: *A significant relationship will not be found between gender and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention.

Hypothesis 6: *A significant relationship will not be found between ethnicity and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention.

Hypothesis 7: *There will be a significant positive relationship between GPA and retention.* A logistic regression model was conducted for this continuous predictor and the criterion, student retention. For example, if GPA was too low the student would be placed on academic probation and may not continue at the college.

Hypothesis 8: *There will be a significant relationship between year in school (2nd year sophomore, etc) and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention. For instance, if the student was a second year sophomore in fall of 2008, that student may have graduated in spring 2009 and would be considered retained for the purposes of this study.

Hypothesis 9: *A significant relationship will not be found between status as independent or dependent and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention.

Limitations

The main limitation for this research measure was the fact that the analysis encompasses aid recipients at one community college and therefore, results can not be generalized to other higher education institutions. Other limitations are the dichotomous options for retention; the researcher would prefer scaled answers, such as number of

credits completed after two semesters. Nevertheless, the institutional and financial aid data at this community college were tested and validated both internally and externally and were able to provide the necessary information to address the research questions.

Conclusion

Based on previous research, the following findings were expected:

- First, a positive significant relationship was expected to be found between Pell grant award amounts and retention for financial aid students at the community college that is the subject of this study. For example, students who receive more grant funds may stay in school longer.

- Second, a positive significant relationship was expected be found between Stafford loan award amounts and retention for financial aid students. (Students who receive more loans may be more likely to remain in school.)

- A negative significant relationship was also expected to be found between amounts of unmet need and retention for financial aid students.

- At the same time, a significant relationship was not expected to be found between the demographic variables of age, gender, ethnicity and status as independent or dependent for all of the demographic items and retention for financial aid students at the community college in this study.

- However, a significant relationship was expected to be found between the demographic variables of year in school and GPA and retention.

This research on financial aid as a predictor of student retention at community colleges is of interest to higher education, specifically community colleges, because of the need to retain their student population until graduation and/or successful transfer to four-year schools. This study provides new empirical data and a statistical basis for financial aid administrators to adjust their decision-making policies if necessary. Appendix B illustrates actual packaging scenarios at the community college for this research.

In addition, if new significant relationships are discovered between any of the demographic factors and retention, that knowledge also benefits college administrators. This study may also be of interest to the financial aid policy-makers in Congress as the legislature continues negotiated rule-making for the new Higher Education Opportunity Act with the National Association of Student Financial Aid Administrators each year another Education act is passed and needs a vote for congressional budget approval. Finally, this research is of interest to the general American public because they are funding these federal financial aid programs via the taxes they pay to subsidize higher education in America.

CHAPTER 4

RESULTS

Introduction

Currently the federal government has no return on investment measure for the

connection between student aid dollars spent and student outcomes in terms of retention

or completion. This research served as a predictive study of the relationship between the

amount of federal Pell grant aid received, federal Stafford loan aid received, student

unmet need, and student retention.

Statistical Model

This quantitative analysis of *ex post facto* (Tabachnick & Fidell, 2007) data of

financial aid awards made in the fall semesters of 2008 and the spring semester of 2009,

attempted to discover whether the receipt of financial aid and unmet need are predictors

of student retention. The study utilized *logistic regression* (Menard, 2002) statistical

models for the types and amounts of aid awards compared to a dichotomous variable for

student retention after two semesters.

Other demographic data, such as age, gender, ethnicity, GPA, year in school,

and dependent or independent status, were also analyzed one by one with a logistic

regression statistical model (Levin & Fox, 2006) to see if demographics were predictive

of student retention. The body of research reviewed (Rothstein & Rouse, 2007; The

Pell Institute, 2004; Tierney, et al, 2007; Roderick, et al, 2008; Rogers, 2005) relating to

federal financial aid, especially the Pell grant program, suggested increasing grant aid and lowering amounts of loans borrowed would positively impact retention.

The present community college research on the federal Pell grant and federal Stafford loan amounts also concurred with these previous studies on financial aid which concluded that increasing the debt burden for community college students is not conducive to their timely graduation (Rothstein & Rouse, 2007; The Pell Institute, 2004; Tierney, et al, 2007; Roderick, et al, 2008; Rogers, 2005). This research revealed that students will be retained in school longer to receive loans longer and to defer the repayment of those loans.

The researcher hypothesized that there would be (1) a positive relationship between the amount of financial aid grant awards and retention of that student in school, with the variables set as dollar amounts for grants and retention measures as "yes" retained at the end of two consecutive semesters – fall 2008 (baseline year) and those same students again in spring 2009. In addition, the researcher hypothesized that there would be (2) a positive relationship between the amount of financial aid loan awards and student retention after two consecutive semesters. Finally, the researcher hypothesized that there would be (3) a negative relationship between the amount of unmet need for students and retention of those students after two consecutive semesters.

The researcher further hypothesized that (4) a relationship would not be found between age, (5) gender, and (6) ethnicity and retention. In contrast, the researcher expected that there would be a relationship between (7) GPA and (8) year in school (2nd year sophomore, etc) and retention. The researcher also hypothesized that there would not be a relationship between (9) status as independent or dependent and retention.

Appendices A through C contain complete definitions of all variables, and the coding

sheet for both independent and dependent variables.

Findings for Demographic Variables

The variables which were classified as demographic for this study were age,

gender, ethnicity, GPA, year in school, and status as an independent or dependent

student. In this section, descriptive statistics will be reported in detail, including

frequencies and percentages for all the (dichotomous) independent variables that are

later included in the discussion of the logistic regression models. In addition, the mean,

standard deviation, minimum, maximum, will be reported for all continuous

independent variables.

Age

The mean age of students receiving financial aid in the form of grants and loans

was 26.4 years of age.

Table 1

Descriptive Results for Age of Financial Aid Students

	Mean Error Rate	Standard Deviation	Sample Size
Minimum 17 years Mean 26.44 years Maximum 65 years	.441	8.194	346

Approximately half of the students were traditional-age students. The table below includes data for 346 students in the study.

Table 2

Financial Aid Students by Age

Age	Number	Valid Percent	Cumulative Percent
17-19 years*	84	24.3	24.3
20-23 years*	86	24.8	49.1
24-30 years	81	23.4	72.5
31-40 years	73	21.1	93.6
41-50 years	19	5.5	99.1
51-65 years	3	.9	100
Total	346	100	100

*Students are classified as dependent per federal financial aid legislation until they reach the age of 24.

Figure 2. Frequency histogram for age of financial aid students and retention
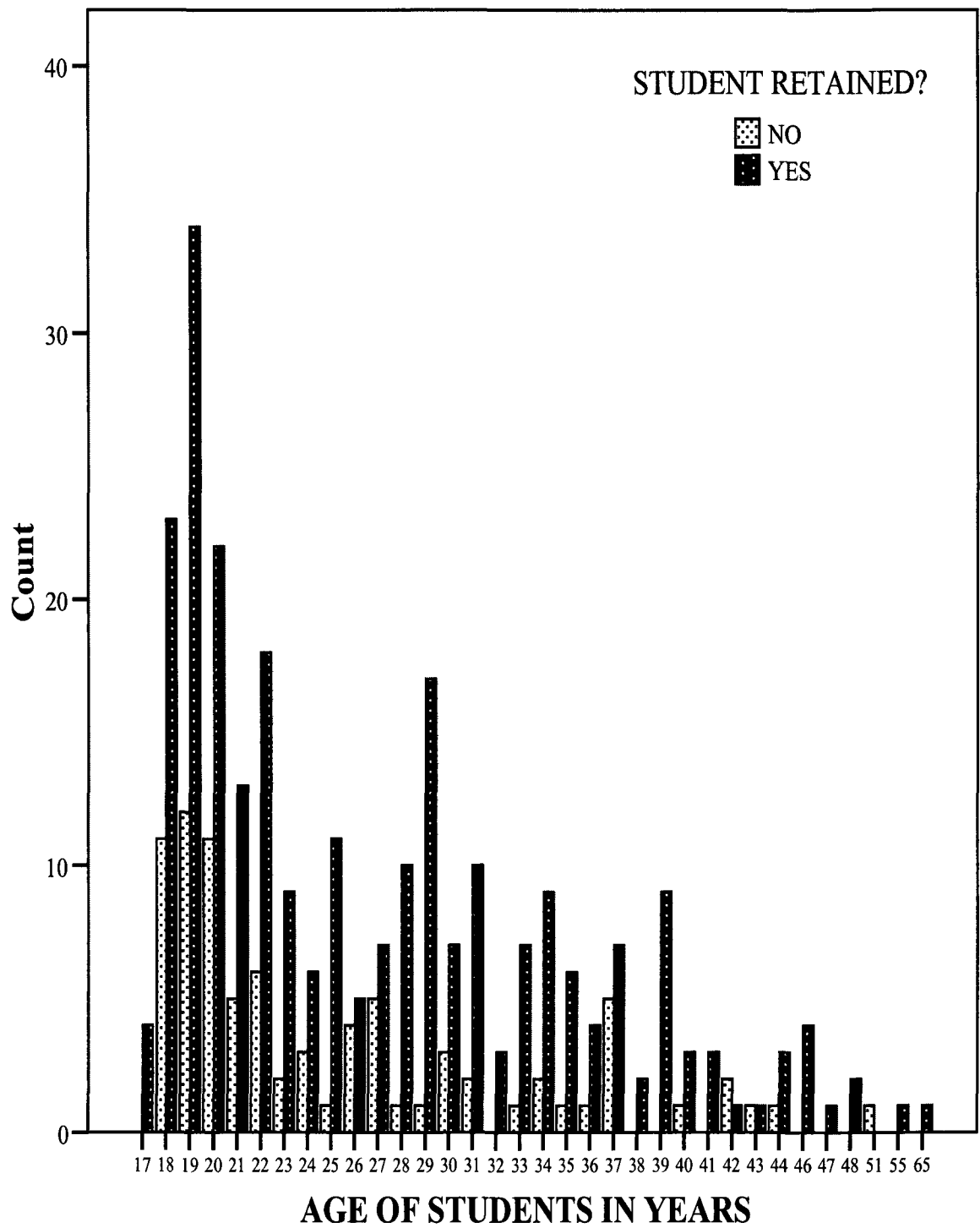
Gender

The variable of gender for students receiving financial aid in the form of grants and loans was dichotomous. Thirty-nine percent of the students receiving financial aid were male. Sixty-one percent of the students who received financial aid were female. The table below includes data for all 346 student borrowers in the study.

Table 3

Financial Aid Students by Gender

Gender	Number	Valid Percent	Cumulative Percent
Male	135	39	39
Female	211	61	100
Total	346	100	100

Figure 3. Bar graph for gender of students receiving financial aid versus retention
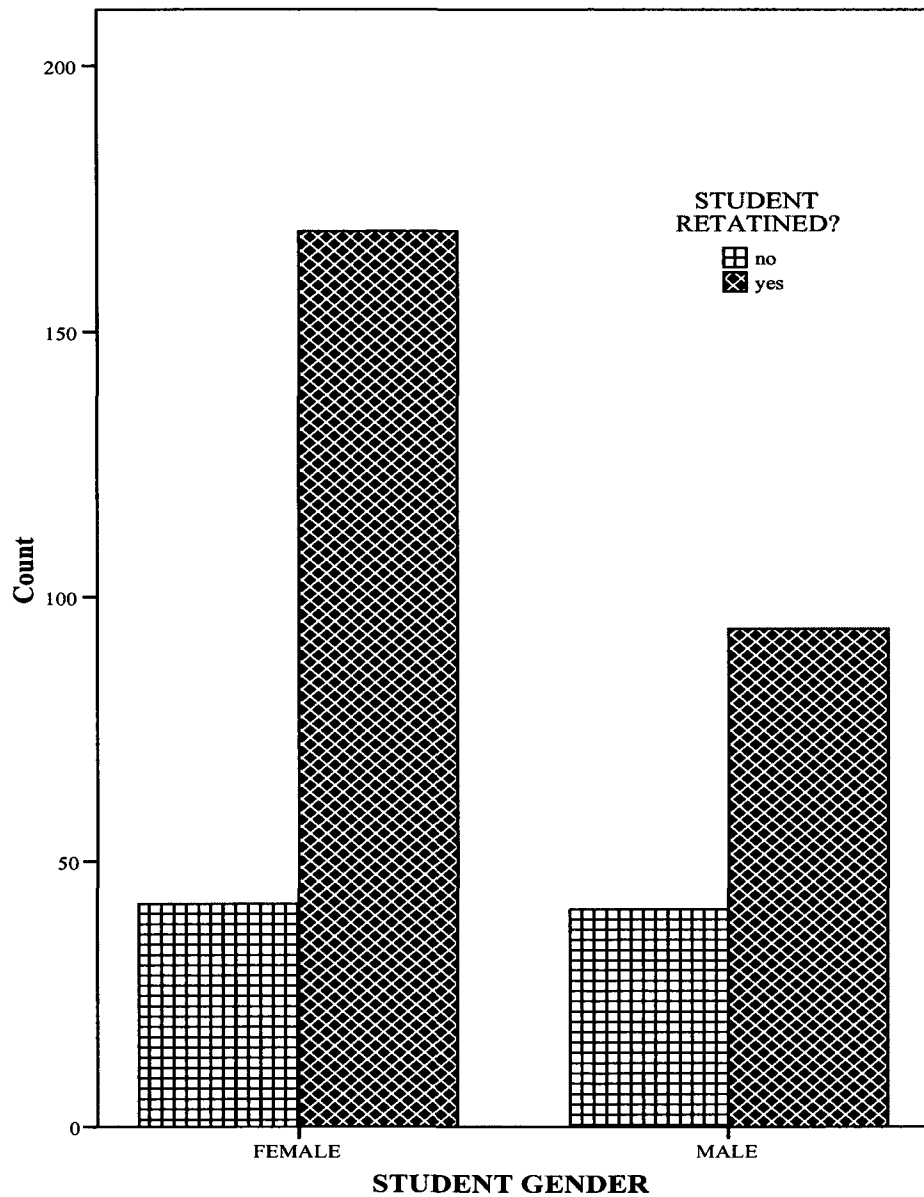
Ethnicity

There were originally six different ethnicity classifications for students receiving

financial aid when the study was conducted. There were 24.6 percent of students self-

identified as African-American in the study. Approximately 67.6 percent of the students

were self-identified as Caucasian. The other 7.8 percent of students consisted of

ethnicities other than Caucasian or African-American.

Table 4

Financial Aid Students by Reported Ethnicity

Ethnicity	Number	Valid Percent	Cumulative Percent
Pacific Islands	2	.6	.6
Native American	3	.9	1.5
Asian	5	1.4	2.9
Hispanic	6	1.7	4.6
Not Specified	11	3.2	7.8
African American	85	24.6	32.4
Caucasian	234	67.6	100
Total	335	100	100

However, the numbers for the ethnicity categories other than Caucasian were so

small that the variables for all the ethnicities other than white were later recoded into

one new category called, 'other.' The table below includes data for only 335 of the

students in the study because 11 students did not specify their ethnicity in the student

database. The logistic regression results described later were based on the ethnicity

variables as displayed in Table 5.

Table 5

Financial Aid Students by Re-Coded Ethnicity

Ethnicity	Number	Valid Percent	Cumulative Percent
Other	101	30	30
Caucasian	234	70	100
Total	335	100	100

Figure 4. Frequency histogram for ethnicity of students receiving financial aid
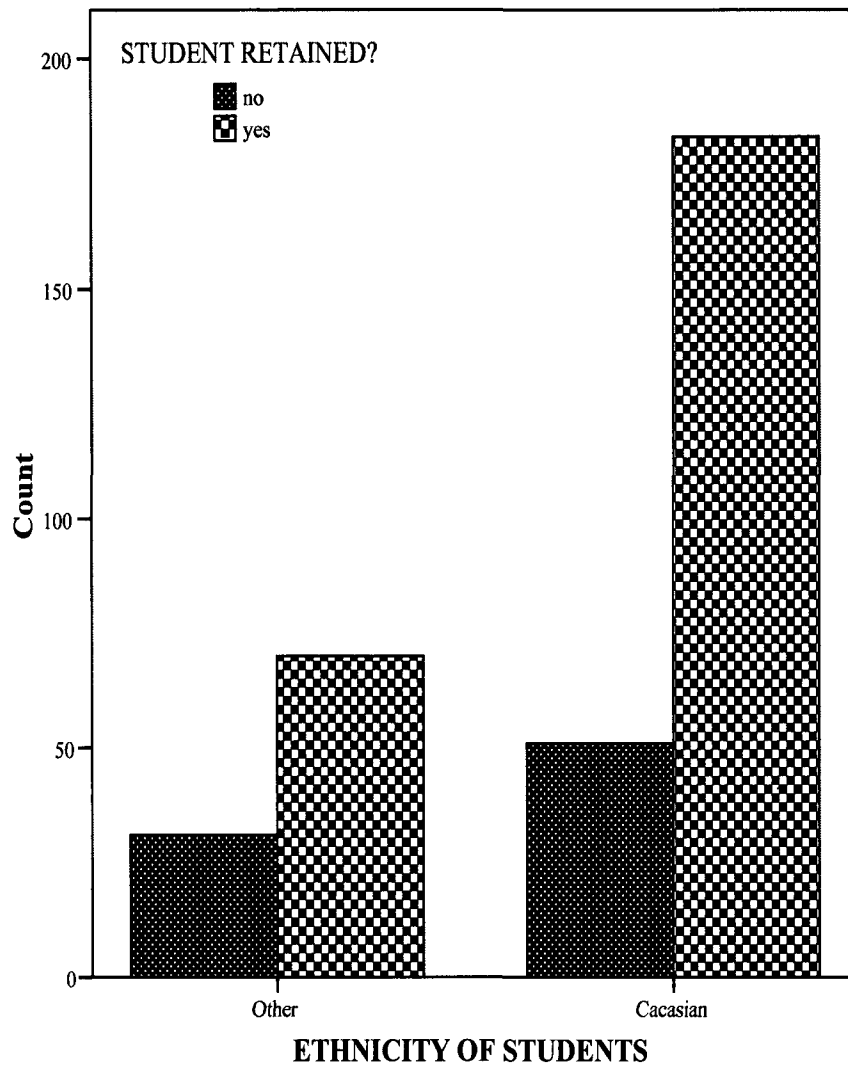
GPA

The Grade Point Average (GPA) for financial aid students achieved at the

institution where the study derived was of great interest to this study. The average GPA

for financial aid recipients was 2.575 or a C + equivalent. The lowest college GPA for

financial aid students (8.9 percent of recipients) was .0 to .75 and the highest 8.1

percent achieved a 4.0.

Table 6

Descriptive Results for GPA of Financial Aid Students

	Mean Error Rate	Standard Deviation	Sample Size
Minimum 0.0 Mean 2.575 Maximum 4.0	.0571	1.0624	346

The researcher also specified six different GPA categories for students receiving financial aid in order to more clearly demonstrate the results. For the logistic regression models which were conducted later, GPA was analyzed as a continuous variable. Nevertheless, for the frequencies, some levels of interpretation were needed. The categories of GPA levels are listed in Table 7.

Table 7

Financial Aid Students by Institutionally Recorded GPA

GPA	Number	Valid Percent	Cumulative Percent
Between 0 and .75*	31	8.9	8.9
Between .76 and .99*	4	1.1	10
Between 1.0 and 1.99*	39	11.3	21.3
Between 2.0 and 2.99**	130	37.6	58.9
Between 3.0 and 3.99**	114	33	91.9
4.0	28	8.1	100
Total	346	100	100

*These students were not meeting the Satisfactory Academic Standards for the college, but were placed on financial aid probation after they were denied and filed an appeal in order to receive aid.
**These students *were* meeting the Satisfactory Academic Standards for the college.

Approximately 21 percent of financial aid students had a GPA of less than 2.0. At the institution where the study took place, the GPA required for graduation was 2.0. The Satisfactory Academic Standards (SAP) requirement to receive financial aid was also to have a 2.0 GPA, however, the 74 students not meeting the SAP minimum GPA requirement had been initially denied financial aid and had since written an appeal to be reconsidered with the result being financial aid probation granted. A student placed on financial aid probation can receive aid in the same amounts and types as a student who is in compliance with the SAP GPA standards. Approximately 80 percent of the students met the SAP requirements for GPA's of 2.0 and above. Additionally, 8 percent of the financial aid students in the study had GPA's of 4.0.

Figure 5. Frequency histogram for GPA of students receiving financial aid.

Mean =2.575
Std. Dev. =1.062
N =346

GRADE POINT AVERAGES OF FINANCIAL AID STUDENTS
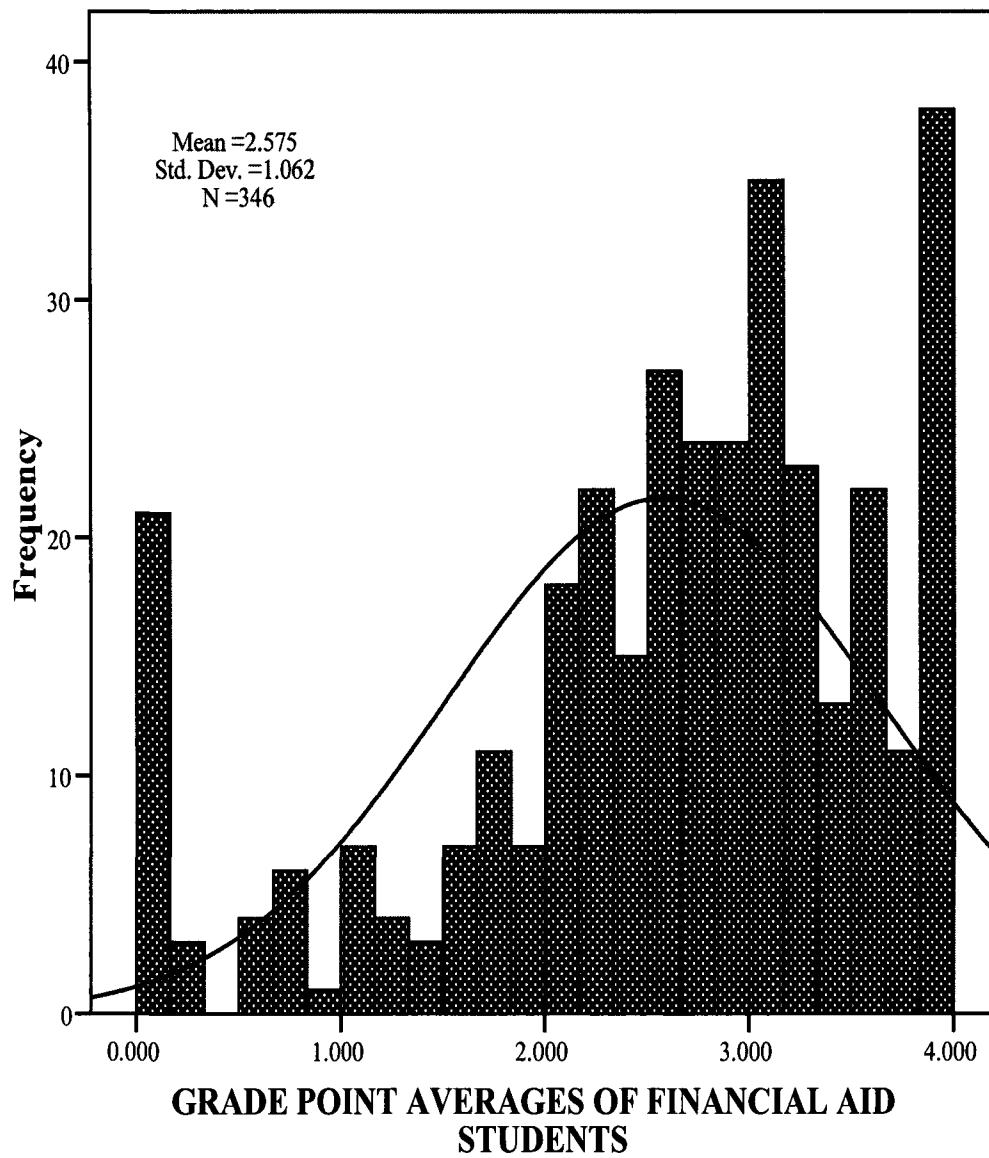
Year in School

The variable of year in school for students receiving financial aid in the form of

grants and loans was dichotomous; either freshman or sophomore. Sixty-seven percent

of the students receiving financial aid were freshman, while 32 percent of the students

who received financial aid were categorized as sophomores.

Table 8 includes data for all 346 students in the study.

Table 8

Financial Aid Students by Year in School

Year in School	Number	Valid Percent	Cumulative Percent
Freshman	233	67.3	67.3
Sophomore	113	32.7	100
Total	346	100	100

Figure 6. Bar graph for year in school of students versus retention

89
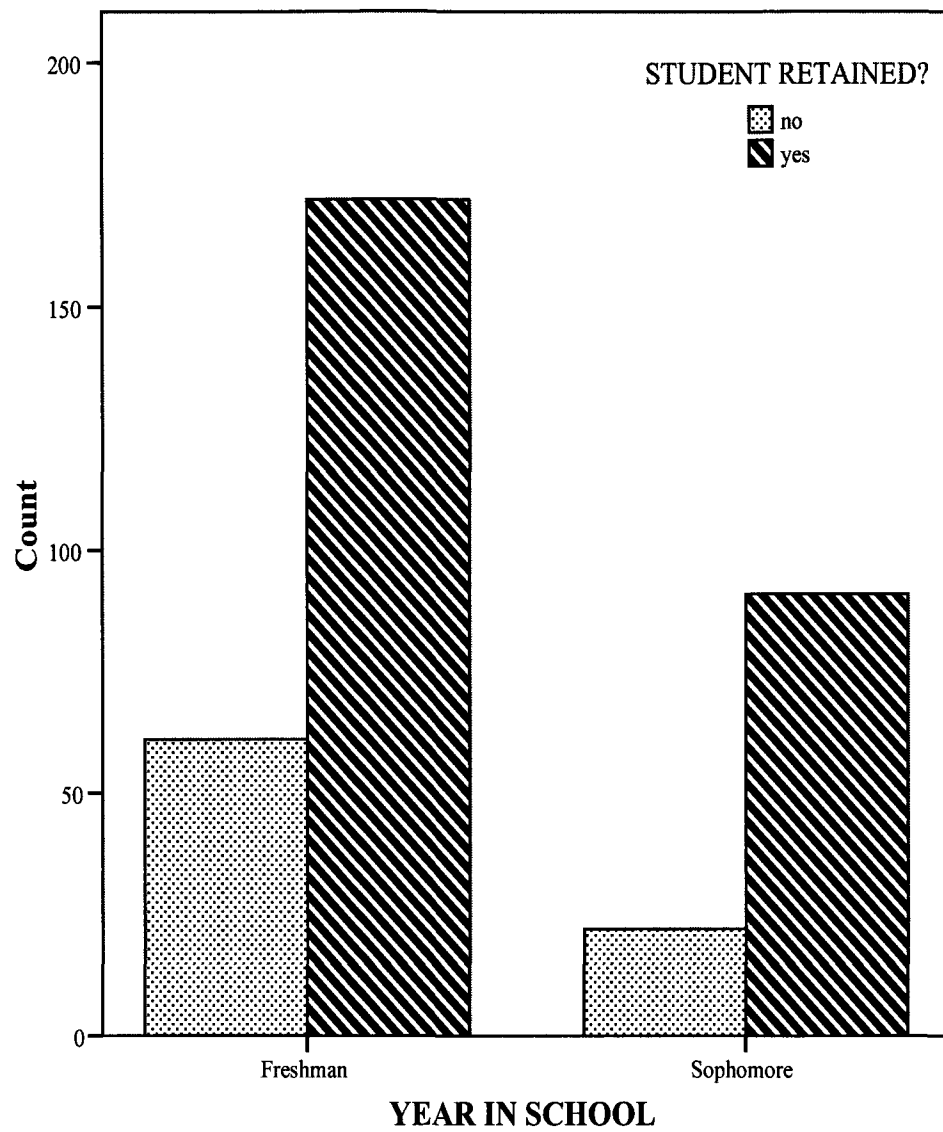
Dependency Status

The variable of status as an independent or dependent student for students receiving financial aid in the form of grants and loans was dichotomous. Forty-six percent of the students receiving financial aid were dependent. Fifty-four percent of the students who received financial aid were considered independent.

Table 9 includes data for all 346 students in the study.

Table 9

Financial Aid Students by Dependency Status

Dependency Status	Number	Valid Percent	Cumulative Percent
Dependent	159	46	46
Independent	187	54	100
Total	346	100	100

Figure 7. Frequency histogram for dependency status of financial aid students
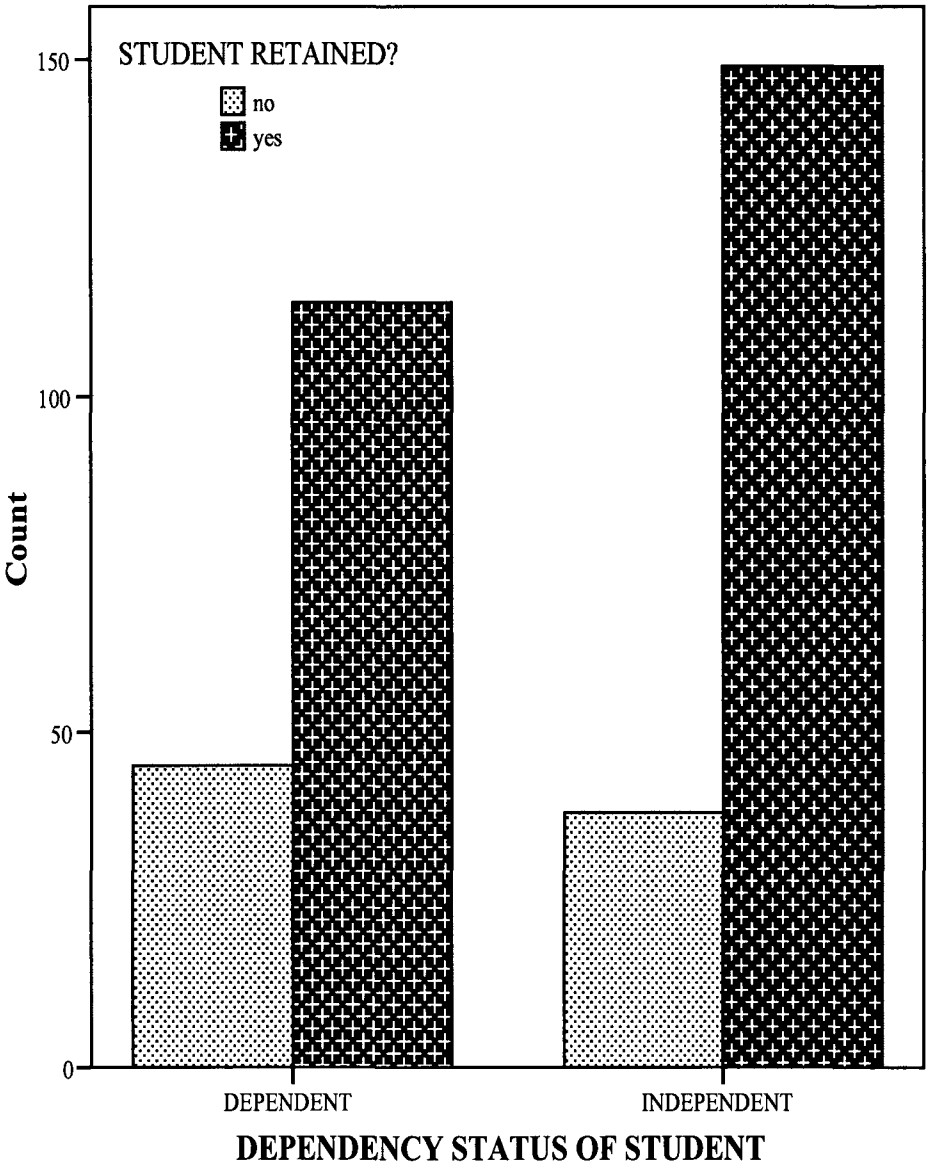
Table 10

Participant Categorical Predictor Demographics by Student Retention (N = 346)

	Student Retention					
Variable	Retention		Non-retention			Total
	n	%	*n*	%	*n*	%
Gender						
Male	94	69.63	41	30.37	135	38.46
Female	169	80.09	42	19.90	211	61.54
Ethnicity*						
Other	70	69.31	31	30.69	101	30.00
Caucasian	183	78.21	51	21.79	234	70.00
Year in School						
Freshman	172	73.82	61	26.18	233	67.30
Sophomore	91	80.53	22	19.47	113	32.70
Dependency Status						
Dependent	114	71.70	45	28.30	159	46.00
Independent	149	79.68	38	20.32	187	54.00

*(N = 335)

Table 11

Participant Continuous Predictor Demographics by Student Retention (N = 346)

Variable	*N*	*M*	*SD*	*Minimum*	*Maximum*
Age					
Retention	263	26.44	8.194	17	65
Non-retention	83	26.44	8.194	17	65
GPA					
Retention	263	2.575	1.0624	0.0	4.0
Non-retention	83	2.575	1.0624	0.0	4.0

Findings for Financial Aid Variables

The next data described are the results for the financial aid variables. First, did the student receive grants in addition to loans? Secondly, what dollar amounts of grants were received? Third, what dollar amounts of loans were received? Next, what dollar amounts of unmet need were still in the financial aid students' budgets after receiving grants and/or loans? Finally, how many credit hours were completed successfully at the end of two semesters? In short, what percent of students were successfully retained after two semesters?

Received Grants

Approximately 65 percent of financial aid students in the study received grants. These 224 students were organized into a separate data file before running the logistic regression analysis so students who did not receive grants would not be included in the resulting output. Table 12 shows the percents of students receiving grants.

Table 12

Financial Aid Students Receiving Grants

Grants	Number	Valid Percent	Cumulative Percent
No	122	35.3	35.3
Yes	224	64.7	100
Total	346	100	100

Amounts of Grants Received

The average amount of grant received by financial aid students was 1,650 dollars. The highest reported federal grant was for 10,675 and may be considered an outlier for

this study-because the student probably received a double-year Pell award. Further

investigation revealed this student to be a recipient of a National Science Foundation

grant – not the federal Pell grant.

Table 13

Descriptive Results for Amounts of Grants Received by Financial Aid Students

	Mean Error Rate	Standard Deviation	Sample Size
Minimum 0.0 Mean 1,649.85 Maximum 10,675	111	2,064.85	224

To more clearly demonstrate the percentages of grant recipients by dollar amounts

of grant received, the following categories were constructed to assess the findings.

Table 14

Amounts of Grants Financial Aid Students Received

Dollars	Recipients	Valid Percent	Cumulative Percent
Up to 1500	106	47.3	47.3
1501 to 3500	59	26.3	73.6
3501 to 5500	42	18.7	92.3
5501 to 7500	8	3.5	95.8
7501 to 9500	9	4	99.8
9501 to 10500	2	.8	100
Total	224	100	100

Figure 8. Frequency histogram for amount of grants received

DOLLAR AMOUNTS OF GRANTS AWARDED TO FINANCIAL AID STUDENTS BY FREQUENCY
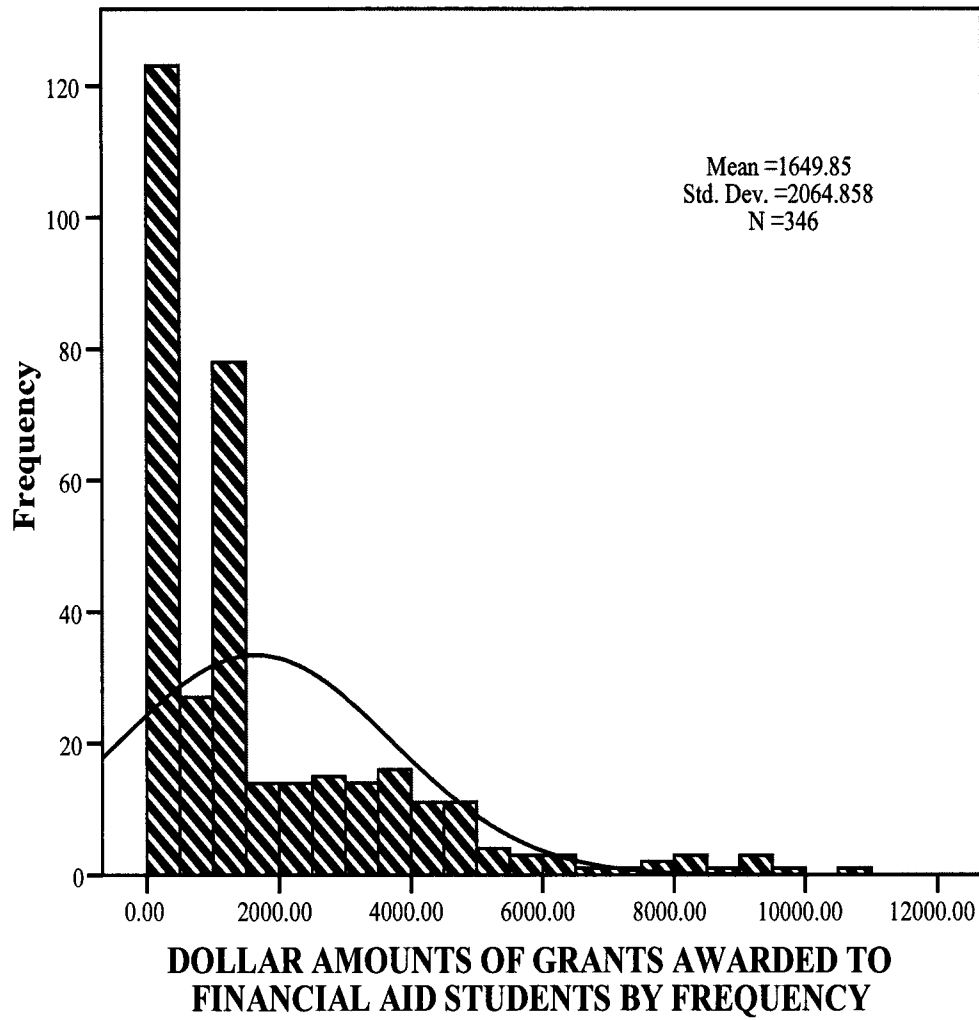
Amounts of Loans Received

The average loan amount borrowed by students at the institution where the study

was conducted was 4,047 dollars for the year. The minimum loan limit for federal

Stafford loans is 200 per semester. Thus the minimum loan in this study was for 400

dollars. The federal maximum a student can borrow in one year at a two-year institution

is 10,500 dollars.

Table 15

Descriptive Results for Amounts of Loans Borrowed by Students

	Mean Error Rate	Standard Deviation	Sample Size
Minimum 400 Mean 4,047.45 Maximum 10,500	125.85	2,341.04	346

To more clearly demonstrate the percentages of loan recipients by dollar

amounts of loans received, the following categories were constructed. The fall and

spring semester amounts were totaled together for an annual number for this study.

There were no summer loans at this college. Table 16 shows the actual dollar amount

total of federal loans students received for the fall 2008 and spring 2009 semesters.

Table 16

Amounts of Loans Financial Aid Students Received

Dollars	Borrowers	Valid Percent	Cumulative Percent
Up to 1500	32	9.2	9.2
1501 to 3500	174	50.3	59.5
3501 to 5500	73	21.1	80.6
5501 to 7500	30	8.8	89.4
7501 to 9500	31	8.9	98.3
9501 to 10500	6	1.7	100
Total	346	100	100

There were six students who borrowed the maximum amount. The category with the largest percentage of borrowers was the 1,501 to 3,500 dollar range. More than half of the borrowers in this study borrowed at this range. One reason for this may be that this institution mails out loan offers of 1750 per semester to all students who do not have a large enough grant award to cover their institutional costs.

Figure 9. Frequency histogram for students receiving loans

DOLLAR AMOUNT OF LOANS BY FREQUENCY
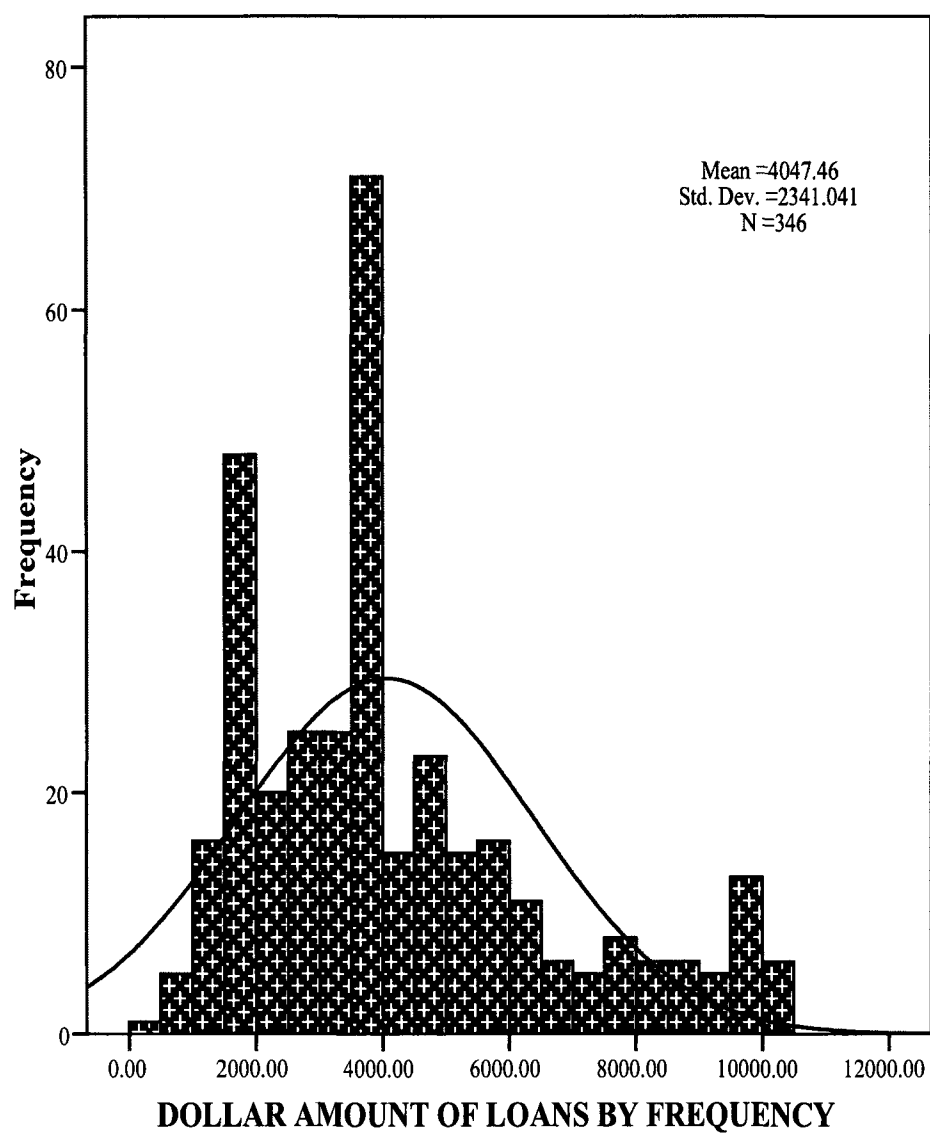
Amounts of Unmet Need in Financial Aid Cost of Attendance Budgets

Every student in this study received financial aid based in part on their Cost of

Attendance (COA) budget for financial aid awarding purposes. The average remaining

need after financial aid was awarded was 7,102 dollars. The results showed one student

had 0 remaining need in his/her COA budget. The maximum need remaining in one student's budget was almost 13,680.

Table 17

Descriptive Results for Amounts of Unmet Need in Cost of Attendance Budgets

	Mean Error Rate	Standard Deviation	Sample Size
Minimum 0	169.37	3,150.58	346
Mean 7,102.64			
Maximum 13,679.40			

The COA budget considers and includes the cost of living in the area where the institution is located as well as the rate for full-time tuition, books and supplies and transportation costs. In other words, the COA is far larger at all institutions than the actual tuition dollar amount and cost of books.

Table 18

Amounts of Unmet Need in Cost of Attendance Budgets

Unmet Need Dollars	Students	Valid Percent	Cumulative Percent
0	1	.3	.3
1 to 1000	11	3.2	3.5
1001 to 5000	77	22.3	25.8
5001 to 8000	119	34.4	60.2
8001 to 11,000	94	27.2	87.4
11,001 to 14,000	44	12.7	100
Total	346	100	100

For a review of what a COA budget consists of and for an example of actual award amounts, see Appendix B.

Figure 10. Frequency histogram for unmet need in Cost of Attendance budgets
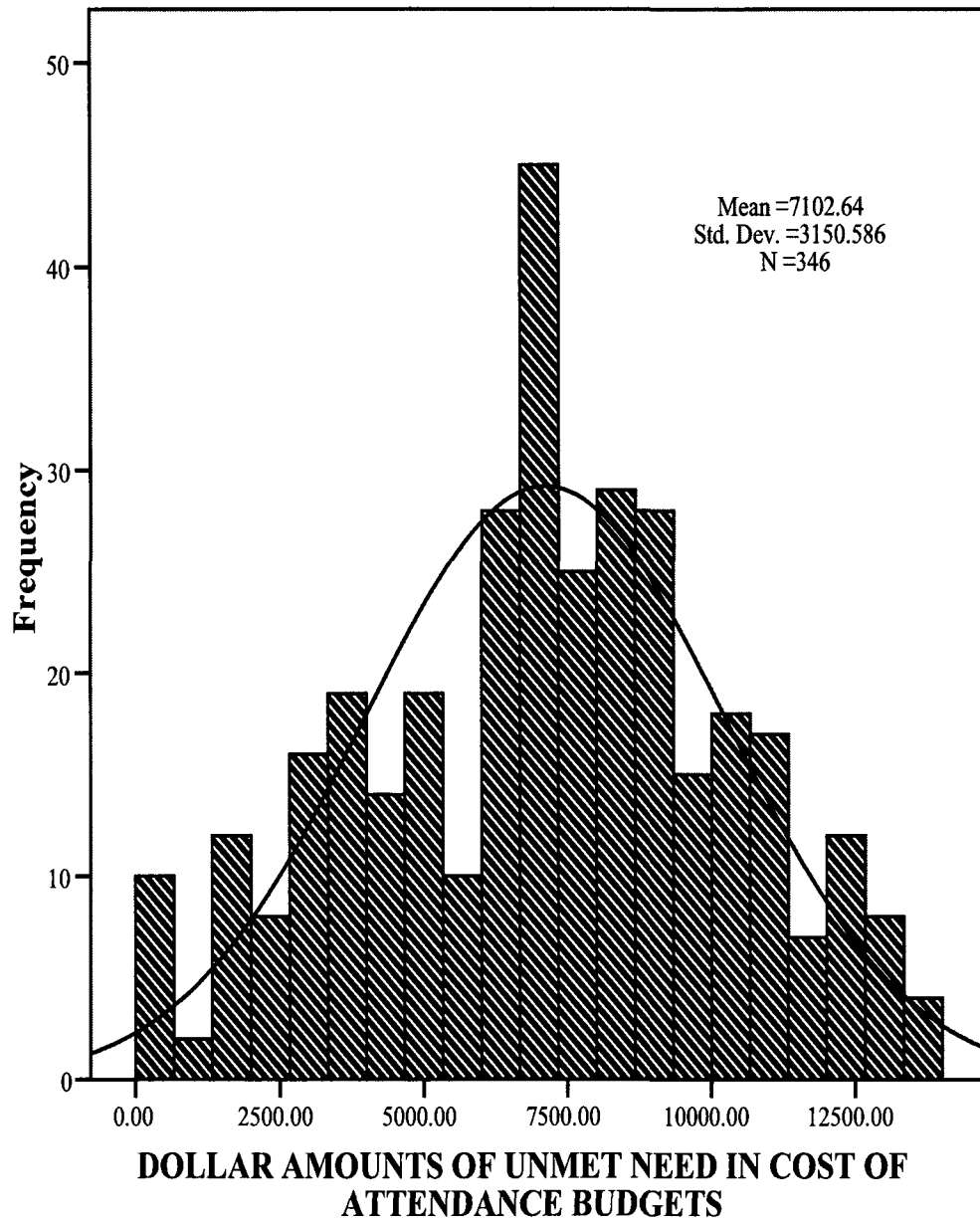
Amount of Credits Completed

The average number of credits completed was almost 16 credits, or eight credits per semester. The minimum amount of credits completed by students who received financial aid was 0 credits.

Table 19

Descriptive Results for Number of Credits Completed in Two Semesters

	Mean Error Rate	Standard Deviation	Sample Size
Minimum 0 Mean 15.76 Maximum 35	.441	8.19	346

There were 15 students who completed 0 credits after two full semesters. This was due to the fact that they withdrew or failed all their courses and were not retained. The maximum number of credits completed was 35 credits, or 17 in one semester and 18 in the other. There were 68 financial aid students who completed 24 or more credits, or were full-time each semester.

Table 20

Number of Credits Completed After Two Semesters

Credits Passed	Number	Valid Percent	Cumulative Percent
0	15	4.3	4.3
1 to 6	36	10.4	14.7
7 to 12	70	20.3	35
13 to 20	125	36.2	71.2
21 to 30	90	26.1	97.3
31 to 35	9	2.6	99.9
Total	346	100	100

As indicated in Table 20 the majority – more than 70 percent of financial aid

students are part-time students. These students completed one to 20 credits worth of

coursework after two semesters, or a 10 credit maximum per semester. This is the norm

at community colleges across America (Vaughan, 2000; Wagner, 2008). Most of the

students attending at two-year institutions are also working or have other pressing

interests competing with completing college (Vaughan, 2000; Wagner, 2008).

Figure 11. Frequency histogram for number of credits completed

TOTAL CREDITS COMPLETED BY FINANCIAL AID
STUDENTS FROM FALL 2008-SPRING 2009
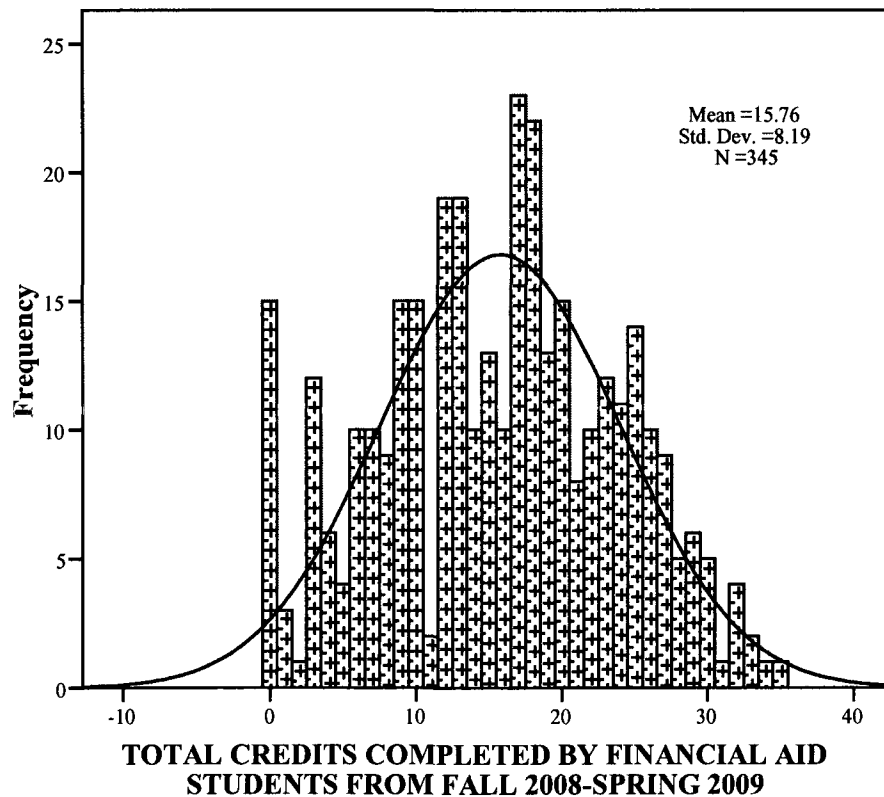
Retained Financial Aid Students

Exactly 76 percent of the students who received financial aid were retained after two semesters. The college-wide retention rate at this college was 64 percent from fall to spring semester or 36 percent of students are not retained from fall to spring on average according to this community college's Office of Institutional Research and Institutional Effectiveness (Atkins-Brady, 2009).

Table 21

Financial Aid Students Retained After Two Semesters

Grants	Number	Valid Percent	Cumulative Percent
No	83	24	24
Yes	263	76	100
Total	346	100	100

Figure 12. Frequency histogram for students successfully retained

Students Retained at the End of Spring 2009?
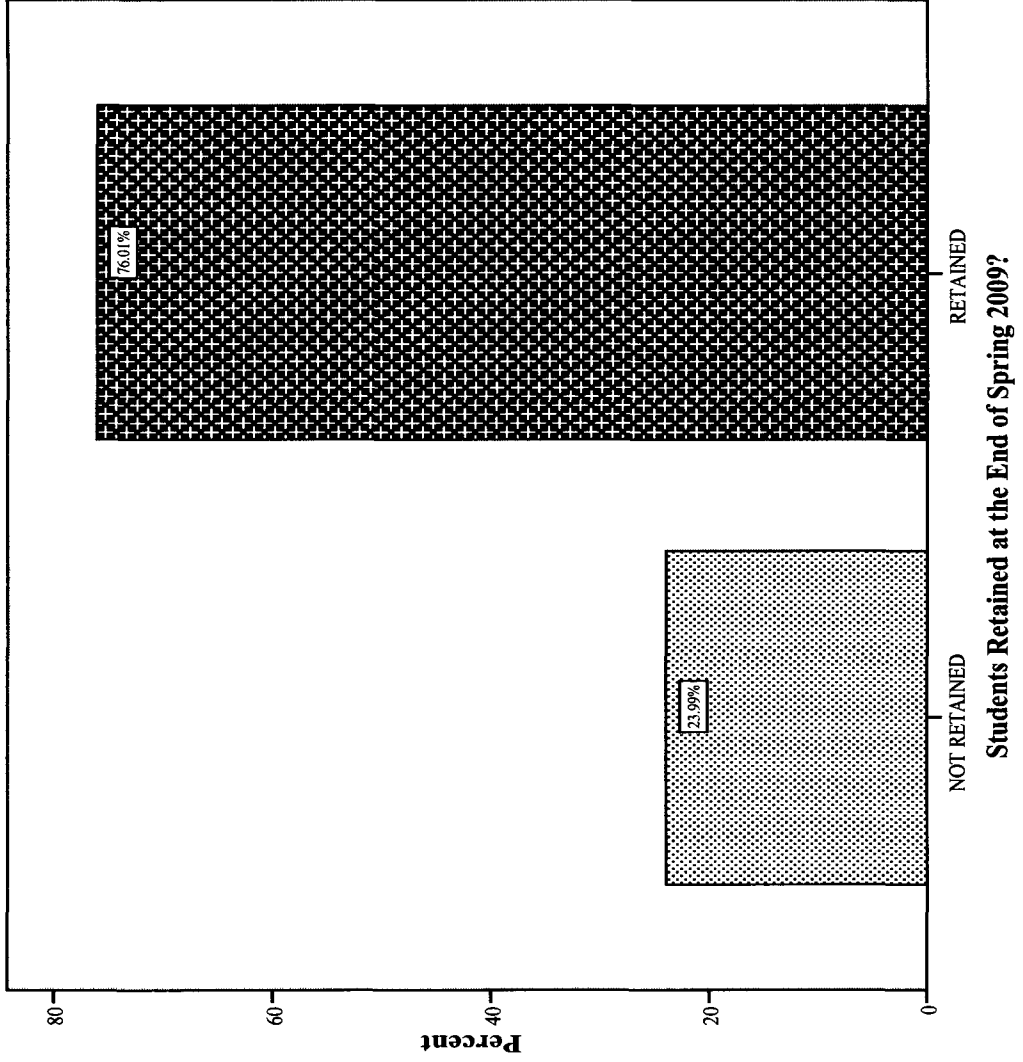
Table 22

Descriptive Statistics of Grant Amounts, Loan Amounts, and Unmet Need by Student Retention (N = 346)

Variable	N	M	SD	Minimum	Maximum
Grant amount*					
Retention	175	1649.85	2064.85	0.0	10675
Non-retention	49	1649.85	2064.85	0.0	10675
Loan amount					
Retention	263	4047.45	2341.04	400	10500
Non-retention	80	4047.45	2341.04	400	10500
Unmet need					
Retention	263	7102.64	3150.58	0.0	13679.4
Non-retention	83	7102.64	3150.58	0.0	13679.4

*(N = 224)

Logistic Regression Results by Hypotheses

SPSS software was used to process the results for this predictive study. Logistic regression was the appropriate statistical procedure for testing these hypotheses because it describes the relationships between a categorical outcome variable (student retention) and one, or more, categorical or continuous predictor variables (i.e. grant amount of 3,000, loan amount of 5,000) (Peng, Lee, & Ingersoll, 2002). When evaluating the goodness-of-fit of the logistic model in SPSS software, the Cox and Snell R^2 and Nagelkerke R^2 will be evaluated (Pampel, 2000, p. 53). Specifically, the significance of the coefficient, or the likelihood that the coefficient in the sample could have occurred by chance alone, will then be interpreted. The following statistical results will be

outlined and reviewed for each of the nine hypotheses in the same order that they were introduced. A complete list of all of the variables and the code sheet is found in Appendix C.

Hypothesis 1: *There is a positive significant relationship between Pell grant award amounts and student retention from fall-to-spring.* The predictor variable was dollar amount of Pell grant and the criterion variable was retention. A logistic regression model utilizing the predictor variables was conducted for Hypothesis 1 measuring retention dichotomously as discussed in the definitions section. The maximum likelihood and goodness-of-fit criteria were also used on this hypothesis to determine the validity of the model.

Results for *H*1: The dollar amount of grants was found to be a useful predictor of retention utilizing a logistic regression, $X^2(1, N = 224) = 11.668, p < .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.051) and the Nagelkerke R^2 (.078).

For the 224 students who received grants in addition to loans, 175 of them were retained after two semesters. This 78 percent retention finding was meaningful because the average student retention at this institution is 64 percent. Every student in the data set ($N = 346$) received Federal Stafford loans, but only 224 ($n = 224$) of these students also received grants. However, we cannot conclude that this 14 percent increase in student retention is a direct result of grant aid as a predictor because of the many other uncontrolled variables at play in a student's life. Furthermore, the retention rate for all

financial aid students in the study was 76 percent. Thus, there is a two percent higher rate of retention for those with grants and loans versus those with just loans.

A logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and dollar amount of grants as the continuous predictor variable. The retention variable was coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student still being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1 - \hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the predictor variable (amount of grants). The model was constructed by an iterative maximum likelihood procedure, to construct the initial model for predicting the observed results. Then the model evaluated the errors in the predictions and changed the regression coefficients in order to increase the likelihood of the observed results under the new model. This process was repeated until there were only trivial differences between the newer and previous models.

The results initially showed that 175 of the students were retained and 49 were not retained after two semesters, so the observed odds were 175/49 = 3.5714. The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 11.668 on 1 *df,* significant beyond .05, which was the confidence interval set for this

test. For this regression model the *p* value = .001. Since this was a test of the null

hypothesis that adding amount of grants to the model would not significantly increase

the capability to predict retention, this finding was meaningful and indicated that

amount of grants may impact retention. The -2 Log Likelihood was 223.676 before

amount of grants was introduced into the model. After dollars amounts of grants were

added to the model, the -2 Log Likelihood statistic was reduced by 235.344 – 223.676

=11.668, or the X^2 statistic. Table 23 contains a summary of the main findings from this

regression.

Table 23

Logistic Regression Analysis with Grant Amount as the Predictor of Student Retention

(N =224)

Parameter	B	EXP(B)	
Grant Amount	.000343*	1.000	
Constant	.526	1.692	

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	11.668*	1		
Goodness-of-fit index			.051	.078

*p < .05

The results from running this regression model revealed the following regression

equation:

$$\ln(ODDS) = .526 + .000343 GrantAmt$$

Thus, the researcher could use this model to predict the odds that students who were awarded a certain dollar amount of grants will be retained with greater likelihood. The odds prediction equation was:

$$ODDS = e^{a+bX}$$

Therefore, if the grant amount was 1,000 dollars, then:

$$ODDS = e^{526 + 000343(1000)} = e^{869} = 2.3845$$

However, if the grant amount was 5,000 dollars, then:

$$ODDS = e^{526 + 000343(5000)} = e^{2241} = 9.4027$$

To convert these odds into probabilities, we first consider the odds for the 1,000 dollar grant and retention:

$$\hat{Y} = \frac{ODDS}{1 + ODDS} = \frac{2.3845}{3.3845} = 0.7045$$

Therefore, the model predicted that 70 percent of students receiving 1,000

dollars in grants will be retained. For the financial aid students receiving 5,000 dollars

in grants:

$$\hat{Y} = \frac{ODDS}{1 + ODDS} = \frac{9.4027}{10.4027} = 0.9038$$

The regression model further predicted that 90 percent of financial aid students

receiving 5,000 in grants will be retained.

The antilog of the logistic regression coefficient is another useful means of

interpreting the findings for grant amounts' relationship to retention. Based on the

actual grant amounts awarded to the students, the exponent of the logistic regression

coefficient multiplied by 1000 (i.e., .000343*1000) was computed to assess how the

odds of retention would increase per 1000-dollar increase in grant amounts:

$$e^{.343} = 1.409$$

The results indicated that, with every 1000-dollar increase in grant amounts, the odds of

retention for a student would increase by a factor of 1.41.

Hypothesis 2: *There is a positive significant relationship between Stafford loan*

amounts and student retention from fall-to-spring. The researcher proposed that the more

deeply students become indebted, the more likely they are to be retained to avoid

repayment. A logistic regression model utilizing the predictor variable, dollar of annual

loan amount, and the criterion, retention-measured dichotomously, was conducted for Hypothesis 2.

Results for *H2*: The dollar amount of loans was found to be a useful predictor of retention utilizing a logistic regression. The results for Hypothesis 2 were as the researcher expected. The findings for the logistic regression model for the dollar amount of loans revealed: $X^2(1, N = 346) = 14.599, p < .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.041) and the Nagelkerke R^2 (.062).

A logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and dollar amounts of loans received as the continuous predictor variable. The retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1 - \hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the continuous predictor variable (amount of loans). The model was constructed by an iterative maximum likelihood procedure, as were all the following logistic regression analyses for this study.

The results initially showed that 263 of the students were retained and 83 were not retained after two semesters, so the observed odds were 263/83 = 3.169. The

goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of

14.599 on 1 df, significant beyond .001. For this regression model the p value =

.000133. This finding was meaningful and indicated the amount of loans may impact

retention. The -2 Log Likelihood was 366.656 before loan amounts were introduced

into the model. After loan amounts were added to the model, the -2 Log Likelihood

statistic was reduced by 381.255-366.656 = 14.599, or the X^2 statistic. See Table 24 for

a complete summary of the findings.

Table 24

Logistic Regression Analysis with Loan Amounts as the Predictor of Student Retention

(N =346)

Parameter	B	EXP(B)	
Loan Amount	.000236*	1.000	
Constant	.276	1.318	

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	14.599*	1		
Goodness-of-fit index			.041	.072

*$p < .05$

The results from running this regression model revealed the following regression

equation:

$$\ln(ODDS) = .276 + .0002359 LoanAmt$$

The researcher could use this model to predict the odds that students who were awarded a certain dollar amount of loans will be retained with greater likelihood. The odds prediction equation was:

$$ODDS = e^{a+bX}$$

Therefore, if the loan amount was 1,000 dollars, then:

$$ODDS = e^{276+0002359(1000)} = e^{5119} = 1.6685$$

However, if the loan amount was 5,000 dollars, then:

$$ODDS = e^{276+0002359(5000)} = e^{1\,4555} = 4.2866$$

Finally, if the loan amount was 10,000 dollars, then:

$$ODDS = e^{276+0002359(10000)} = e^{2\,635} = 13.9433$$

To convert these odds into probabilities, we first consider the odds for the 1,000 dollar loan and retention:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{1.6685}{2.8885} = 0.6252$$

Therefore, the model predicted that almost 63 percent of students receiving 1,000 dollars in loans will be retained. For the financial aid students receiving 5,000 dollars in loans:

$$\hat{Y} = \frac{ODDS}{1 + ODDS} = \frac{4.2866}{5.2866} = 0.8108$$

So, the regression model predicted that 81 percent of financial aid students receiving 5,000 in loans will be retained. For the financial aid students receiving 10,000 dollars in loans:

$$\hat{Y} = \frac{ODDS}{1 + ODDS} = \frac{13.9433}{14.943312} = 0.9330$$

The regression model predicted that 93 percent of financial aid students receiving 10,000 in loans will be retained. This is the direction of retention increase that the researcher expected. It was originally posited that as the dollar amount of loans increased the likelihood of the student being retained would increase. This is what the logistic regression model demonstrated.

The antilog of the logistic regression coefficient is another useful means of interpreting the findings for loan amounts' relationship to retention. Derived from the actual loan amounts awarded to the students, the antilog of the logistic regression coefficient multiplied by 1000 (i.e., .0002359*1000) was computed to assess how the odds of retention would increase per 1000-dollar increase in loan amounts:

$$e^{.2359} = 1.266$$

The results indicated that, with every 1000-dollar increase in loan amounts, the odds of retention for a student would increase by a factor of 1.27.

Hypothesis 3: *There is a negative significant relationship between unmet need amounts in the student's financial aid budget and that student's retention from fall-to-spring.* The researcher posited that the more unmet need students had the less likely they were to be retained because of the economic situation of that student's family. A logistic regression model utilizing the predictor variable, unmet need, and the criterion, retention – again measured dichotomously – was conducted for Hypothesis 3.

Results for *H3*: The results for this hypothesis were as predicted; the dollar amount of unmet need was found to be a useful predictor of negative retention utilizing a logistic regression. The findings for the logistic regression model for the dollar amount of unmet need in the Cost of Attendance budgets revealed: $X^2(1, N = 346) = 12.955, p < .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.037) and the Nagelkerke R^2 (.055).

A logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and dollar amounts of unmet need in the cost of attendance budget as the continuous predictor variable. The retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the continuous predictor variable (amount of unmet need). The model was constructed by an iterative maximum likelihood procedure.

The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 12.955 on 1 df, significant beyond .001. For this regression model the p value = .0003191. This finding was meaningful and indicated the amount of unmet need may negatively impact retention. The -2 Log Likelihood was 368.300 before unmet need amounts were introduced into the model. After unmet need was added to the model, the -2 Log Likelihood statistic was reduced by 381.255-368.300 = 12.955, or the X^2 statistic.

See Table 25 for a complete summary of the findings.

Table 25

Logistic Regression Analysis with Unmet Need in the Budget as a Negative Predictor of Student Retention (N =346)

Parameter	B	EXP(B)	
Unmet Need	-.00015*	1.000	
Constant	2.275	9.730	

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	12.955*	1		
Goodness-of-fit index			.037	.055

*$p < .05$

The results from running this regression model revealed the following regression equation:

$$\ln(ODDS) = 2.275 + -.00015 UnmetNeed$$

The researcher could use this model to predict the odds that students who still had unmet need amounts in their budget would not be retained with significant likelihood. The odds prediction equation was:

$$ODDS = e^{a+bX}$$

Therefore, if the unmet need amount was 1,000 dollars, then:

$$ODDS = e^{2\,275 + -\,000150(1000)} = e^{2\,125} = 8.3729$$

However, if the unmet need amount was 5,000 dollars, then:

$$ODDS = e^{2\,275 + -\,000150(5000)} = e^{1\,525} = 4.5951$$

Finally, if the unmet need amount was 10,000 dollars, then:

$$ODDS = e^{2\,275 + -\,000150(10000)} = e^{775} = 2.1706$$

To convert these odds into probabilities, we first consider the odds for the scenario with

1,000 dollars of unmet need and retention:

$$\hat{Y} = \frac{ODDS}{1 + ODDS} = \frac{8.3729}{9.3729} = 0.8933$$

Therefore, the model predicted that 89 percent of students having 1,000 dollars

of remaining need in their budgets will be retained. For the financial aid students having

5,000 dollars of remaining need in their budgets:

$$\hat{Y} = \frac{ODDS}{1 + ODDS} = \frac{4.5951}{5.5951} = 0.8212$$

So, the regression model predicted that 82 percent of financial aid students with

5,000 dollars of unmet need will be retained. For the financial aid students having

10,000 dollars of remaining need in their budgets:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{2.1706}{3.1706} = 0.6846$$

As expected, the regression model predicted that 69 percent of financial aid

students having 10,000 dollars of remaining need in their budget after financial aid was

awarded will be retained. It was originally posited that as the dollar amount of unmet

need increased the likelihood of the student being retained would show a percentage

decrease. This is exactly what the logistic regression model demonstrated. As the dollar

amounts of unmet need increased, the predicted odds for the student's retention after

two semesters decreased.

The antilog of the logistic regression coefficient is another useful means of

interpreting the findings for unmet need in relation to retention. Based on the actual

unmet need amount in the student budgets, the antilog of the logistic regression

coefficient multiplied by 1000 (i.e., -.00015*1000) was computed to assess how the

odds of retention would decrease per 1000-dollar increase in unmet need amounts:

$$e^{-.15} = .8607$$

The results indicated that, with every 1000-dollar increase in unmet need amount, the odds of retention for a student would decrease by a factor of .86.

Hypothesis 4: *A significant relationship will not be found between age and retention.* A logistic regression model was conducted for this continuous predictor and the criterion, student retention.

Results for *H*4: The results for this hypothesis were as expected. The researcher considered age as the predictor of student retention after two full semesters of enrollment. The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 2.549 on 1 *df,* that was not significant beyond .001. For this regression model the *p* value = .110 (Menard, 2002). Thus, the odds of age making a prediction of student retention were not found to be useful. Consequently, age was not found to be a significant predictor of student retention. $X^2(1, N = 346) = 2.549, p > .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.007) and the Nagelkerke R^2 (.011).

A logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and age of the student as the continuous predictor variable. The retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 -

$\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the

continuous predictor variable (age). The model was constructed by an iterative

maximum likelihood procedure.

The findings for this regression model were not meaningful and indicated age

does not impact retention. The -2 Log Likelihood was 378.707 before age was introduced

into the model. After age was added to the model, the -2 Log Likelihood statistic was

reduced by 381.256-378.707 = 2.549, or the X^2 statistic. See Table 26 for a complete

summary of the findings.

Table 26

Logistic Regression Analysis with Age as a Predictor of Student Retention

(N =346)

Parameter	B	EXP(B)	
Age	.026	1.026	
Constant	.484	1.622	
Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	2.549	1		
Goodness-of-fit index			.007	.011

Hypothesis 5: *A significant relationship will not be found between gender and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention.

Results for *H5*: The results for Hypothesis 5 were not as the researcher expected. Indeed, it was discovered that gender was a predictor for retention and this was not as the researcher expected. The gender of the student was found to be a useful predictor of retention utilizing a logistic regression: $X^2(1, N = 346) = 4.869, p < .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.014) and the Nagelkerke R^2 (.021).

A bivariate logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and financial aid students' gender as the dichotomous predictor variable. Male was internally re-coded as "0" and female as "1", with the retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1 - \hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the

predictor variable (gender). The model was constructed by an iterative maximum likelihood procedure.

The results initially showed that 263 of the students were retained and 83 were not retained after two semesters, so the observed odds were 263/83 = 3.169. The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 4.869 on 1 df, significant beyond .05, which was the confidence interval set for this test. For this regression model the p value = .027. Since this was a test of the null hypothesis that adding gender to the model would not significantly increase the capability to predict retention, this finding was meaningful and indicated that gender may impact retention. The -2 Log Likelihood statistic was 376.386 before gender was introduced into the model.

After gender was added to the model, the -2 Log Likelihood statistic was reduced by 381.255 − 377.683 = 4.869, or the X^2 statistic.

See Table 27 for a complete summary of the findings.

Table 27

Logistic Regression Analysis with Gender as the Predictor of Student Retention (N =346)

Parameter	B	EXP(B)
Gender	.563*	1.755
Constant	.830	2.293

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	4.869	1		
Goodness-of-fit index			.014	.021

*$p < .05$

The results from running this regression model revealed the following regression equation:

$$\ln(ODDS) = .830 + .563 Gender$$

So the researcher could use this model to predict the odds that students of a certain gender will be retained with greater likelihood. The odds prediction equation was:

$$ODDS = e^{a+bX}$$

Therefore, if the student was male, then:

$$ODDS = e^{830+563(0)} = e^{830} = 2.2933$$

However, if the student was female, then:

$$ODDS = e^{830+563(1)} = e^{1393} = 4.0269$$

To convert these odds into probabilities, we first consider the odds for male retention:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{2.2933}{3.2933} = 0.6963$$

Therefore, the model predicted that approximately 70 percent of male financial aid students will be retained. However, for the female financial aid students:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{4.0269}{5.0269} = 0.8011$$

So, the regression model predicted that 80 percent of female financial aid students will be retained.

The antilog of the logistic regression coefficient is another useful means of interpreting the findings for age in relation to retention. Due to internal re-coding of female as '1', the antilog of the logistic regression coefficient represented the ratio of odds of retention in the female group to the odds of retention in the male group (i.e., odds ratio):

$$e^{.563} = 1.7559$$

The results indicated that, if the gender of the student was female, the odds of retention for a student would be greater than the male counterpart by a factor of 1.76. For the female students the odds were 4.0269 and for the male group the odds were 2.2933 so the female-to-male retention odds ratio was 4.0269/2.2933 = 1.7559.

Hypothesis 6: *A significant relationship will not be found between ethnicity and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention.

Results for *H*6: As expected, the ethnicity of the student was not found to be a useful predictor of retention utilizing a logistic regression. $X^2(1, N = 335) = 2.940, p >$ .05. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.009) and the Nagelkerke R^2 (.013).

First, the demographic variable of ethnicity was coded individually for each race, with six separate races listed, including 'not specified'. The students who did not provide an answer to this question were later removed (11 cases removed) from the logistic regression and this data was re-coded into two ethnic categories because the type groups other than Caucasian had such small percentages of participants. For the recoding, a category called "other" and coded as "0" was created while Caucasian was coded the same as before as "1".

A logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and financial aid students' ethnicity as the

dichotomous predictor variable. Other ethnicity was internally re-coded as "1" and Caucasian as "0", with the retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the predictor variable (ethnicity). The model was constructed by an iterative maximum likelihood procedure.

The results initially showed that 253 of the students were retained and 82 were not retained after two semesters, so the observed odds were 253/82 = 3.085. The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 2.940 on 1 df, significant beyond .05, which was the confidence interval set for this test. For this regression model the p value = .086. Since this was a test of the null hypothesis that adding ethnicity to the model would not significantly increase the capability to predict retention, this finding was meaningful and indicated that ethnicity may impact retention. The -2 Log Likelihood was 369.930 before ethnicity was introduced into the model. After ethnicity was added to the model, the -2 Log Likelihood statistic was reduced by 372.870 − 369.930 = 2.940, or the X^2 statistic. See Table 28 for a complete summary of the findings.

Table 28

Logistic Regression Analysis with Ethnicity as the Predictor of Student Retention

(N =335)

Parameter	B	EXP(B)
Ethnicity	-.463	.629
Constant	1.278	3.588

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	2.940	1		
Goodness-of-fit index			.009	.013

Hypothesis 7: *There will be a significant positive relationship between GPA and retention.* A logistic regression model was conducted for this continuous predictor and the dependent criterion, student retention.

Results for *H7*: The results for this hypothesis were as the researcher expected. The Grade Point Average (GPA) of financial aid students was found to be a useful predictor of retention utilizing a logistic regression. When the Chi-square likelihood ratio test was conducted the *p* value = .0000000000000003, which was found to be significant beyond .001. In fact, GPA was found to be a stronger predictor of student retention than any of the other variables in the study. The findings for the logistic regression model for the GPA of financial aid students revealed: $X^2(1, N = 346) =$

66.857, $p < .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.176) and the Nagelkerke R^2 (.263).

A logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and GPA of financial aid students as the continuous predictor variable. The retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the continuous predictor variable (GPA). Again, the model was constructed by an iterative maximum likelihood procedure.

The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 66.857 on 1 *df*, significant well beyond .001. This finding was meaningful and indicated that GPA is a significant predictor of student retention. The -2 Log Likelihood was 314.398 before GPA was introduced into the model. After GPA was added to the model, the -2 Log Likelihood statistic was reduced by 381.255-314.398 = 66.857, or the X^2 statistic. See Table 29 for a complete summary of the findings for this logistic regression model.

Table 29

Logistic Regression Analysis with Grade Point Average as the Predictor of Student

Retention (N =346)

Parameter	B	$EXP(B)$
GPA	1.002*	2.725
Constant	-1.202	.301

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	66.857	1		
Goodness-of-fit index			.176	.263

*$p < .05$

The results from running this regression model revealed the following regression

equation:

$$\ln(ODDS) = -1.202 + 1.002 GPA$$

The researcher then used this model to predict the odds that students with certain

GPA's will be retained with greater likelihood. The odds prediction equation was:

$$ODDS = e^{a+bX}$$

Therefore, if the GPA was 1.0, then:

$$ODDS = e^{-1.202+1.002(1)} = e^{-2} = .8187$$

However, if the GPA was 2.0, then:

$$ODDS = e^{-1.202+1.002(2)} = e^{.802} = 2.2299$$

But if the GPA was 3.0, then:

$$ODDS = e^{-1.202+1.002(3)} = e^{1.804} = 6.0739$$

Last, if the GPA was 4.0, then:

$$ODDS = e^{-1.202+1.002(4)} = e^{2.806} = 16.5436$$

To convert these odds into probabilities, we first consider the odds for the GPA of 1.0

and retention:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{.8187}{1.8187} = 0.45$$

Therefore, the model predicted that 45 percent of students with a GPA of 1.0

will be retained. For the financial aid students with a 2.0 GPA:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{2.2299}{3.2299} = 0.69$$

So, the regression model predicted that 69 percent of financial aid students with

a 2.0 GPA will be retained. For the financial aid students with a 3.0 GPA:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{6.0739}{7.0739} = 0.859$$

The regression model predicted that 86 percent of financial aid students with a

3.0 GPA will be retained. Finally, for the financial aid students with a 4.0 GPA:

$$\hat{Y} = \frac{ODDS}{1+ODDS} = \frac{16.5436}{17.5436} = 0.943$$

Thus we see the regression model predicted that 94 percent of financial aid

students with a 4.0 GPA will be retained. This is definitely the direction of retention

increase that the researcher expected. It was originally posited that as GPA showed a

positive increase, the more the likelihood of the student being retained would increase

and this was supported by the probabilities produced from running this logistic

regression.

The antilog of the logistic regression coefficient is another useful means of interpreting the findings for GPA in relation to retention. Based on 1.0 increments of a student's GPA, the exponent of the logistic regression coefficient multiplied by 1.0 (i.e., 1.002*1) was computed to assess how the odds of retention would increase per 1 point increase in a student's GPA:

$$e^{1.002} = 2.7237$$

The results indicated that, with every 1.0 point increase in the GPA of the student, the odds of retention for a student would increase by a factor of 2.72.

Hypothesis 8: *There will be a significant relationship between year in school (2nd year sophomore, etc) and retention.* A logistic regression model was conducted for this categorical variable to see if there was a relationship between the variable and student retention.

Results for *H*8: The year in school, such as freshman, sophomore, etc., of the student was not found to be a useful predictor of retention utilizing a logistic regression: $X^2(1, N = 346) = 1.929, p > .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.006) and the Nagelkerke R^2 (.008).

A bivariate logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and financial aid students' year in school as the dichotomous predictor variable. Freshman was internally re-coded as "1" and sophomore as "0", with the retention variable coded as "1" for retained and "0" for

not retained. The regression model predicted the logit, or the natural log of the odds of

the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 -

$\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the

predictor variable (year in school). As before, the model was constructed by an iterative

maximum likelihood procedure.

The results initially showed that 263 of the students were retained and 83 were

not retained after two semesters, so the observed odds were 263/83 = 3.169. The

goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of

1.929 on 1 df, that was not significant beyond .001. For this regression model the p

value = .165. Since this was a test of the null hypothesis that adding year in school to

the model would not significantly increase the capability to predict retention, this

finding was not meaningful and indicated that year in school makes no retention impact.

The -2 Log Likelihood was 379.327 before year in school was introduced into

the model. After year in school was added to the model, the -2 Log Likelihood statistic

was reduced by 381.256 – 379.327 = 1.929, or the X^2 statistic. See Table 30 for a

complete summary of the findings.

Table 30

Logistic Regression Analysis with Year in School as the Predictor of Student Retention

(N =346)

Parameter	B	EXP(B)
Year in School	-.383	.682
Constant	1.420	4.136

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	1.929	1		
Goodness-of-fit index			.006	.008

Hypothesis 9: *A significant relationship will not be found between status as independent or dependent and retention.* A logistic regression model will be conducted for this categorical variable to see if there is a relationship between the variable and student retention.

Results for *H9*: The results for this hypothesis were as the researcher expected. The status of the student, as either independent or dependent, was not found to be a useful predictor of retention: $X^2(1, N = 346) = 2.994, p > .05$. The other two goodness-of-fit tests for this model were the Cox and Snell R^2 (.009) and the Nagelkerke R^2 (.013).

A bivariate logistic regression was conducted using student retention after two semesters as the dichotomous criterion variable and financial aid students' status as dependent or independent as the dichotomous predictor variable. Dependent was coded as "0" and independent as "1", with the retention variable coded as "1" for retained and "0" for not retained. The regression model predicted the logit, or the natural log of the odds of the student being retained. That is:

$$\ln(ODDS) = \ln\left(\frac{\hat{Y}}{1-\hat{Y}}\right) = a + bX$$

Where $\hat{Y}$ is the predicted probability of the event which is coded with 1 (retention), 1 - $\hat{Y}$ is the predicted probability of the student not being retained (0), and where X is the predictor variable (dependency status). For this final logistic regression, the model was constructed by an iterative maximum likelihood procedure as were all the previous models.

The results initially showed that 263 of the students were retained and 83 were not retained after two semesters, so the observed odds were 263/83 = 3.169. The goodness-of-fit test (Omnibus Test of Model Coefficients) revealed a Chi-Square X of 2.994 on 1 df, that was *not* significant beyond .001. For this regression model the p value = .084. Since this was a test of the null hypothesis that adding status to the model would not significantly increase the capability to predict retention, this finding was not significantly meaningful and indicated that status does not impact retention. The -2 Log Likelihood was 378.261 before status was introduced into the model. After gender was added to the model, the -2 Log Likelihood statistic was reduced by 381.255 – 378.261 = 2.994, or the X^2 statistic. See Table 31 for a complete summary of the findings.

Table 31

Logistic Regression Analysis with Dependency Status as the Predictor of Student

Retention (N =346)

Parameter	B	EXP(B)
Dependency Status	.437	1.548
Constant	.930	2.533

Overall model evaluation	χ^2	df	Cox and Snell R^2	Nagelkerke R^2
Likelihood ratio test	2.994	1		
Goodness-of-fit index			.009	.013

This summary of the results for all nine logistic regression models concludes the chapter on results and the implications of these findings will be discussed in the next chapter.

CHAPTER 5

DISCUSSION, IMPLICATIONS AND CONCLUSION

"Finally, it is appropriate to end this study by reinforcing the notion that increasing assess to post-secondary education is a laudable goal, but that access without completion will not confer many of the benefits that accompany a postsecondary credential. Going to college is great, but finishing with a degree or certificate is even better" (Rogers, 2005, p. 132).

Introduction

This chapter of the study reviews the problem of the study, the justification for the study, and assesses the study's theoretical constructs in view of the findings of the study. This chapter also discusses both the significant and non-significant results that were generated by the logistic analyses, and what these results suggest for financial aid and policy research. Findings will be discussed by research question. The final section of the chapter will address the implications of these findings for practical application, research, and public policy.

Re-Statement of the Problem

The purpose of this study was to determine the relationship between student financial aid awarded, unmet financial need, and fall-to-spring student retention of students at a small, public, southeastern, U.S. community college. Specifically, this research studied the predictor effects for amount of Pell grants, amount of Stafford loans, and amount of remaining unmet need students' budgets on the fall-to-spring retention for these students.

Re-statement of the Justification of the Study

Student retention issues and student matriculation have become more important for all colleges (Tinto, 1994; Robotham & Julian, 2006). In the current climate of tightening budgets nationwide, and increasing scrutiny by the federal government for return on investment, the senior administrators at higher education institutions, and the American public, needs to know if a connection exists between the amount of student financial aid awarded and student retention rates.

Five years ago, "Sixty percent of all undergraduates received student aid, averaging about $6,600. Almost half - 49 percent - received grants and 30 percent received loans," (Pekow, 2006, p. 11). At the time when the students in this study were awarded aid, fall 2008 and spring 2009, more than 100 billion was committed to Federal financial aid (Bowen, Chingos, & McPherson, 2009).

These numbers are increasing every year while U. S. President Barak Obama has recommended that federal Pell grant award decrease 819 dollars to a maximum of 4,731 dollars beginning in the 2011-12 academic year (United States Department of Education, 2008). However, this proposed cut to federal spending (H.R. 1, a seven-month fiscal year spending bill passed by the House on February 19, 2011) was outvoted 56 to 44 by the Senate on March 9, 2011.

Therefore, it is only logical for administrators in community colleges and other higher education institutions and other stakeholders to want to know if a connection exists between the amounts of student financial aid awarded and student retention rates (St. John, 1992; Perna , 1998; Tinto, 2004; St. John, Paulson, & Carter, 2005; Wessel, Bell, McPherson, Costello, & Jones, November 2006). A few of the questions that

demand a response are as follows. How much are they being awarded? What is the rate of retention for financial aid students?

Re-statement of the Research Questions

1. To what extent does the amount of Pell grant awarded predict retention from fall to spring semester?

2. To what extent does the amount of Stafford loan award predict retention from fall to spring semester?

3. To what extent does the amount of unmet need in a student's financial aid budget predict retention from fall to spring semester?

4. Is the age of the students related to retention from fall to spring semester?

5. Is the gender of the students related to retention from fall to spring semester?

6. Is the ethnicity of the students related to retention from fall to spring semester?

7. Is the Grade Point Average (GPA) of the students related to retention from fall to spring semester?

8. Is the year in school (freshman or sophomore) for the students related to retention from fall to spring semester?

9. Is dependent or independent status of the students related to retention from fall to spring semester?

Discussion of Findings

This section discusses the significant and the non-significant results that were generated by the logistic analyses, and what they suggest for financial aid and in relation to previous research. The three main hypotheses of this study were all supported by significant findings from the logistic regression models. The dollar amounts of federal Pell grants and Stafford loans were both found to be significant positive predictors for student retention after two semesters. As the amount of grant aid and loans increased, the predicted rate of student retention also increased. As expected, the higher dollar amounts of unmet need remaining in the students' budgets were found to be a significant negative predictor of student retention. The results will be discussed as a comparison of previous literature and research on the topics of financial aid, retention and community colleges. Findings will be discussed by research question.

I. Pell Grants. For the financial aid students, 78 percent (at a significance level of $p = .001$) of those receiving Pell grants were retained versus 64 percent overall. The logistic regression model predicted that 70 percent of students receiving 1,000 dollars in grants will be retained. However, the regression model predicted that 90 percent of financial aid students receiving 5,000 in grants will be retained. As dollars increased, student retention was also impacted positively. *The trend was a 20 percent increase in retention with an increase of 4,000 in grants.*

These findings were as expected and supported by previous research on financial aid and retention. Research regarding financial aid showed that the type (loans, grants, and/or work study) and amount of financial aid makes different types of impacts

on retention. The results of Perna's (1998) descriptive statistics and path analysis study also suggested that grant-only and work study financial aid packages have more positive direct effect on retention than loans.

For the 224 students who received grants in addition to loans, 175 of them were retained after two semesters. This 78 percent retention finding was meaningful because the average student retention at this institution is 64 percent. However, we cannot infer conclusively that this 14 percent increase in student retention is a direct result of grant aid as a predictor because of the many other uncontrolled variables at play in a student's life although one is likely to make that logical conclusion with findings of this significance level.

Furthermore, the retention rate for all financial aid students in the study was 76 percent. Thus, there was a two percent higher rate of retention for those with grants and loans versus those with just loans. This was an eye-opening finding because of the strength of the significance level ($p = .001$), but was supported by additional previous researchers (The Pell Institute, 2004; Rothstein & Rouse, 2007; Tierney, et al, 2007; Roderick, et al, 2008; Rogers, 2005).

This finding validates the purpose for which the Pell grant was created by Congress. The economic reasoning behind the Pell grant was the belief that providing funds for students to attain a college degree would lead to a more educated citizenry and improve the economic status of those who used their degrees for better employment opportunities (Rogers, 2005; U.S. Department of Education, 2010). The United States Congress has assessed the status of financial aid from time to time, usually in the form of a committee or commission such as the one in 2002. The Advisory Commission on

Student Financial Aid (ACSFA) conducted a report on the status of student financial assistance that stated many qualified young people (43 percent) do not enter a four-year college within two years of completing high school and some (16 percent) never attempt college at all because of prohibitive costs (2002, p. 25).

At the time this report was published nine years ago, federal financial aid was budgeted for $60 billion a year, only 12 billion of which was for critical grant programs (Advisory Commission on Student Financial Aid, 2002, p. 1). It was the strong recommendation of the ACSFA report that the federal government should increase amounts of need-based grant aid (Pell) in order to, "..enable students to persist by reducing work and loan burden..." (2002, p. 37). In response, Congress increased the federal ratio of Pell grant allocations to 20 billion.

Legislation for financial aid programming has continued up to the present College Cost Reduction and Continued Access Act (CCRCAA) of 2008 and the HEA's of 2008 and 2009 (U. S. Department of Education, 2008). The CCRCAA which went into effect July 1st, 2008 included these new loan stipulations; 1) Federal loans are not erased by filing bankruptcy, 2) Interest rates for subsidized loans changed to 5.6 percent, 3) Schools are required to offer loan entrance and exit counseling, and 4) Student borrowers of every age and category were allowed to borrow an additional 2,000 dollars per year (U. S. Department of Education, 2008). Students have taken advantage of these additional loan limits in surprising numbers at community colleges.

II. Stafford Loans. For the financial aid students, 76 percent (at a significance level of p = .00133) of those receiving Stafford loans were retained versus 64 percent

overall. The 76 percent retention finding for students with loans was statistically

meaningful because the average student retention at this institution is 64 percent. For

the introduction of financial aid into the model causing predicted retention to increase

by 12 percent is a remarkable finding.

The logistic regression model predicted that 63 percent of students receiving

1,000 dollars in loans will be retained. The regression model predicted that 81 percent

of financial aid students receiving 5,000 in loans will be retained. To continue this

upward trend, the regression model predicted that 93 percent of financial aid students

receiving 10,000 in loans will be retained. *Thus, we find a 30 percent increase in*

retention between students borrowing 1,000 versus 10,000.

This was the direction of retention increase that the researcher hypothesized. It

was originally posited that as the dollar amount of loans increased the likelihood of the

student being retained would increase and this is what the logistic regression model

demonstrated. As expected, as the dollar amounts of loans increased, the predicted odds

for the student's retention after two semesters increased exponentially.

This may be due to the fact that life issues cause the student to borrow heavily,

so they will not have to work as much while they are in school. The students know from

attending loan entrance counseling with the loan officer that they have a six month

grace period from the time they are not enrolled at least half-time before they begin to

receive repayment bills (Federal Student Financial Aid Handbook, 2009).

A review of the literature revealed nominal support for the findings of the

present study. Perna (1998) found student borrowers less likely to graduate within five

years than non-financial aid recipients. Rothstein & Rouse (2007) found that students

with no loan debt were more likely to find and work at the job of their choice regardless of remuneration, whereas students with debt were more likely to seek higher paying employment regardless of job fit or satisfaction. These students felt pressure from loan debt to seek the higher salaried jobs rather than pursue their ideal career which fit their qualifications (Rothstein & Rouse, 2007).

To present the loan debt situation at the community college level in relation to historical national levels, the 1993-1994 and 2003-2004 *National Postsecondary Student Aid Surveys* (NPSAS) found average four-year graduate's loan debt in 1993 was $8,462. However, in 2004 it had increased to $13,275. Now we take these national debt amounts and recall that the National Center for Education Statistics reports, "Fifty-two percent of students attending college in their own state attended public community college," (Pekow, 2006).

This brings us to the community college for this study where the average debt for currently borrowing students is 8,381.50 dollars mid-way through their degree programs (Institutional Data, 2005-2009). According to the data-set, students in this study ($N = 346$), who borrowed loans for fall 2008 and spring 2009, carried a total debt load in excess of 2.9 million dollars. If these students continue to borrow at their current levels per year, they will average 16,763 dollars in debt at the culmination of their two-year degrees or upon their separation date from the college should they cease attending without achieving a degree. Bear in mind many students attend half-time and require 4-6 years to achieve these two-year credentials. The standard repayment for 16,763 dollars in federal loans is 140 dollars every month for ten years.

This situation creates an antecedent for one final concern - the default rate of the school. Since the Higher Education Amendments (HEA) of 1998, the default rate serves as an accountability measure to see if the school is allowed to keep offering loans or to keep a financial aid office open and available to its students. When this HEA was passed by congress, President William Clinton signed this bill (P.L. #105-244) on October 7, 1998 setting in motion the following financial aid changes: 1) The federal Pell grant amounts were increased; 2) Schools that lose eligibility to offer federal loans because of their loan default score were not allowed to offer any federal grants either; 3) Students preparing to teach following baccalaureate achievement could still qualify for Pell grants; and 4) Student eligibility for aid expanded due to income protection allowances (U.S. Department of Education, 2010).

When the default score of a college reaches 25 percent they are not allowed to keep making loans (U.S. Department of Education, 2010). If it stays 25 percent for three consecutive years, the financial aid office will be asked to close by the federal government because, as this law states, schools are not allowed to offer federal grants either due to their default rate (U.S. Department of Education, 2010).

This unfortunate event occurs more in the private, for-profit sector institutions than is does at community colleges, but there have been cases where financial aid offices at community colleges chose to cease offering a loan program, due to viable concern over their default score trends. For example, at the community college where the study occurred, a federal loan program was active in the mid 1990's and then was discontinued from the late 1990's until 2005. When the loan program was re-opened in 2005, the residual default score was still 12.5 percent. Four years later, by February

2009, it was 6.9 percent. In 2010, it was 7.5 percent. The default rate at this community college where the study was conducted is currently 13.3 percent in February of 2011. This is not the directional trend the school or the researcher was hoping to see occur, with 10.3 students out of every 100 students in repayment, unable to service the debt.

An alternate and more positive scenario to students servicing their debt without a degree occurs when the student receives the repayment notification, calls the loan office and finds out six credits of enrollment will cause the bill to go away, and he/she re-enrolls in college. With the economic necessity to avoid loan repayment, this is sometimes enough incentive for students to achieve a degree, and this is consistent with the study's findings. In order to measure how often and to what effect this scenario occurs, a longitudinal borrower study would need to be conducted over a four to eight year period of time with the same student cohorts.

III. Unmet Need. The extent to which the dollar amounts of unmet need in the student budget negatively predicted student retention was significant at a level of $p = .0003191$, or a stronger predictive than either grants or loans. This finding was meaningful and significantly predicted a *20 percent decrease* in student retention for those with 10,000 dollars remaining in their budget versus those students with only 1,000 dollars of unmet need.

To summarize, this significant logistic regression model predicted:

- 89 percent retention for students with 1,000 dollars of unmet need
- 82 percent retention for students with 5,000 dollars of unmet need

- 69 percent retention for students with 10,000 dollars of unmet need

It was originally theorized that as the dollar amount of unmet need increased the likelihood of the student being retained would show a percentage decrease. This is exactly what the logistic regression model demonstrated. We can logically conclude from this finding that more need equivocates to less likely student retention.

Previous research supports this finding. Students who had greater financial need disqualified at higher rates and persisted to graduation at lower rates according to a study of 21,243 students (Wessel, Bell, McPherson, Costello, & Jones, 2006). In addition, a study similar to the present one employing dichotomous retention variables and a logistic regression with a community college student sample found receipt of financial aid related to fall-to-spring retention for first-year students at a significance level of .05 or higher (Fike & Fike, 2008). Their research also used bivariate correlation coefficients to discern the association of student retention with each predictor variable and they found over 50 percent of the first-time-in-college students were not retained from fall to the following fall (Fike & Fike, 2008).

One of the foundational constructs under girding the current research and its findings was Economic Persistence Theory which derives from Abram Maslow's hierarchy of needs. For example if students' basic needs are not being met due to a lack of finances, they may be too worried to concentrate on their coursework. The current findings of negative retention trends due to higher unmet need are validated by Economic Persistence Theory.

Furthermore, research by the American Association of Community Colleges (AACC) reinforces the issue of unmet need. The AACC found the pressing economic

need to work is keeping college students from earning degrees or certificates (American Association of Community Colleges, February/March 2010). Their Public Agenda survey asked 22-30 year-olds to list their greatest obstacles keeping them from graduation. "Fifty-six percent of the respondents listed the need to work full time as a major impediment preventing them from returning to school, (AACC, February/March 2010, p. 8). Finally, Heller's (2003a) study of data from the U.S. Department of Education examined whether state awards are related to student persistence and degree attainment. The results validated previous research on retention and found economic and funding links to students making their way to certificate or degree completion (Heller, 2003a).

Along with Wild and Ebbers (2002) Fike and Fike stated that community college student characteristics, such as the example of students needing to work rather than wanting to work, are different from university students and their retention predictors merit further scholarship. One of the main ways that community colleges differ from traditional, residential, four-year institutions of higher education is the age of their students.

IV. Age. The age of the students was not found to be related to retention. For this regression model the p value = .110. Consequently, the odds of age making a prediction of student retention were not found to be useful (Menard, 2002).

How do community college student demographics compare to traditional four-year institutions? According to commission research by the AACC and ACT, 51 percent of community college students are first-generation students – neither parent

attended college (Nomi, 2005). This research found that, "First-generation college students are more likely to be women, older than traditional college age, employed full time, with dependents living at home" (Nomi, 2005, p. 1). The research also revealed that these older students typically take fewer credits hours per semester and face difficult financial and family issues leading to more attrition (Nomi, 2005). The current research did not support this historical data in regard to age of student and retention which lead the researcher back to Economic Persistence Theory.

However, a further explanation based on my years of experience as a financial aid administrator at a community college, could include the following two actual cases from the data in this study. When a student is older and classified as independent for financial aid awarding calculations, he/she can qualify for financial aid balance checks of 6,248.80 dollars per semester. This is a tangible incentive to remain enrolled for several years. See the example below:

Full-time Independent Student Budget EFC of 0:
School Cost of Attendance = **$14,786**
Minus - Student's Expected Family Contribution = $0
Minus - Pell Grant Student is Awarded = $5,350
Minus – Stafford Subsidized Loan at Freshman Amount = $3,500
Minus – Stafford Unsubsidized Loan at Ind. Amount = $5,936
Student's Financial Unmet Need = $0
Student received **$14,786** in Federal Financial Aid for the Year.
Student's instate **tuition rate was $2,288.40** for 24 credits.
Student's cash refund checks totaled: **$12,497.60**

In contrast, an 18-year-old traditional age college student with parent AGI on their FAFSA might not qualify for the Pell grant and would not receive as large of

balance checks −1,605.80 per semester – or just enough to buy their textbooks and school supplies. This teen-age student often holds an outside job that distracts them from degree completion. See the example below:

Full-time Dependent Student Budget EFC of 5,000:

School Cost of Attendance = **$10,886**

Minus - Student's Expected Family Contribution = $5,000

Minus – Stafford Subsidized Loan at Freshman Amount = $3,500

Minus – Stafford Unsubsidized Loan at Dependent Amount = $2,000

Student's Financial Unmet Need = $5386

Student received **$5,500** in Federal Financial Aid for the Year.

Student's instate tuition rate **(actual bill) was $2,288.40** for 24 credits.

Student's cash refund checks totaled: **$3,211.60**

Thus we return to the premise that economic reasons are a stronger incentive toward retention or toward attrition – needing to work long hours at employment that leads to lack of degree completion. Receiving 12,497.60 per year in balance checks is a very tangible, and economically pragmatic, incentive to remain enrolled in a community college for a number of years.

V. Gender. The gender of the student was related to retention. For this regression model the p value = .027. These results were not as the researcher expected. The results indicated that, if the gender of the student was female, the odds of retention for a student would increase by a factor of 1.76. First, the researcher did not propose that gender would be significantly related to retention at all. Also the type of gender (female) that was found to persist at a higher predicted rate was only partially supported by other research of financial aid and retention (Gross, Hossler, & Ziskin, 2007).

This significant logistic regression model predicted that 81 percent of female financial aid students would be retained. The regression model further predicted that 70 percent of male financial aid students will be retained. This 11 percentage point lead was somewhat distressing to discover in the 21st Century when we are supposed to be a gender equitable society.

This finding was only partially supported by previous research at the university level (Tinto, 1993; Bean, 1996; Rogers, 2005). "Logistic regression analysis showed that low-income female students were 35 percent less likely than their male counterparts to attain a credential by the end of six academic years," (Rogers, 2005, p. 109-110). In the study by Gross, Hossler, and Ziskin (2007) the effects of aid were greater for men than for women, all else being equal. Nevertheless, their study concluded those findings were not strong enough to validate financial aid as the only reason for persisting (Gross, Hossler, & Ziskin, 2007).

Perhaps at the community college where this study was conducted there was a larger percent of female students in this study dealing with an *ex post facto* institutional data set. Perhaps a follow-up qualitative study could drill deeper into this finding and bring to light more reasons for higher female retention in relation to male retention.

VI. Ethnicity. As expected, the ethnicity of the student was not found to be a useful predictor of retention utilizing a logistic regression. The *p* value = .086 for this regression model.

In most retention literature, groups considered to be ethnic minorities, were found to persist at lower rates than Caucasian students. As expected, this model

predicted that 69 percent of financial aid students categorized as 'other' will be retained, while 78 percent of students self-identified as 'Caucasian' will be retained.

This nine percentage point difference was not as envisioned by the researcher in terms of the strength of the lead in predicted odds, because financial aid was theorized to level the arena somewhat. However, this finding was supported by the pre-existing retention literature. "It is important to note that many financial aid research studies have determined that a significant relationship exists between race/ethnicity and student persistence and attainment," (Rogers, 2005, p. 111). This study further validated previous studies that pointed to ethnicity as a predictor of retention.

It was hoped that the receipt of financial aid, or the socio-economic demographics of this area of central Virginia, would level the playing field for retention. Nevertheless, the reason the predicted rates of retention were higher for Caucasians than for the other ethnicities in the present student could be because of the small percentage of students classified as 'other' was dwarfed by the larger proportion (70 percent) of Caucasian students when the logistic regression was modeled. In other words, the small number of students classified as other (4.6 percent other plus 24.6 percent African American) may have just happened to have a lower than average retention rate. This would cause the results to be skewed somewhat in the favor of the group classified as Caucasian students.

VII. Grade Point Average. As Hypothesis 7 indicated, GPA was actually the strongest predictor of student retention in this study. The results for this hypothesis were as the researcher expected and as all previous literature on retention suggested. When

the Chi-square goodness-of-fit test for this logistic regression model was calculated the

p value = .0000000000000003.

Accordingly, the GPA attained at the community college in this study, not at a

high school before enrolling in this community college, was found to be a useful

predictor of retention. This predictor model displayed the following upward trend:

- The model predicted 45 percent retention of students with a 1.0 GPA

- The model predicted 69 percent retention of students with a 2.0 GPA

- The model predicted 86 percent retention of students with a 3.0 GPA

- The model predicted 94 percent retention of students with a 4.0 GPA

This is definitely the direction of retention increase that the researcher expected,

but the researcher did not foresee that GPA would be a stronger predictor than any of

the financial aid variables in this study. However, the literature on retention supports

this finding. Heller's (2003a) research on retention supported academic factors as a

strong predictor of student retention to graduation and degree attainment. Also, a study

of financial aid categories for students stratified by academic ability, found academic

ability was more strongly indicative of academic disqualification or persistence to

graduation than was the category of financial aid alone (Wessel, et al, 2006).

Even the research on developmental course work supports the findings on GPA.

Fike and Fike (2008) discovered the predictor variables of passing developmental

courses-particularly developmental reading courses ... and the number of hours enrolled

in the first semester all indicated levels of student persistence at a significance level of

.05 or higher.

The researcher only had permission granted/access to one year of institutional and financial aid data to analyze. If access were granted to multiple years of institutional data, and a comparison/contrast of GPA and award amounts from one year to the next could be analyzed. This would lend a greater level of complexity to a future study of similar nature.

VIII. Year in School. Year in school, such as freshman or sophomore, of the student was not found to be a useful predictor of retention utilizing a logistic regression. For this regression model the p value = .165. The researcher theorized that more sophomores would be retained than freshmen. The reasoning for this theory was because many of the programs/degrees/certificates at this community college require 40 to 66 credits to graduate and thus students are considered sophomore from the point at which they achieve 30 credits until they are finished. There are no junior or senior rankings at community colleges designated as two-year schools.

The researcher expected the finding for hypothesis 8 to be significant, but the theory driving this hypothesis was discredited, or this sample was not suited to the question. The theory was that as students progress in their college careers they would be more invested in finishing and therefore sophomore retention rates would be just as high, or higher, than freshman rates and this was found to be so. The theory driving this question was that freshman, of all ages, would be more inexperienced with the level of coursework required at the college level and they would not persist as strongly as sophomores. As expected sophomore retention odds were 1.47 higher than freshmen. Perhaps a four-year institution would be a better arena to test this theory because there

would be four categories of progression toward degree attainment to measure but the expected trend was nominally supported by this study.

In the American community college system enrollment is open admission for anyone with a high school diploma or GED, not-with-standing placement testing scores or previous college academic records (AACC, 2009). As a result, of the open access to enrollment, many of these students need to take developmental courses. These factors may affect student retention rates (Wilmer, 2009). Because of this open enrollment policy, the demographics of community college student populations are not comparable to the student populations at four-year institutions and so previous student retention research conducted at such institutions cannot be generalized for the community college student population (Tinto & Love, 1995; Wild & Ebbers, 2002; Rogers, 2005).

IX. Dependency Status. The results for this hypothesis were as the researcher expected and were not significant. The status of the student, as either independent or dependent, was *not* found to be a useful predictor of retention utilizing a logistic regression. For this regression model the p value = .084. Although this finding was not significant, the fact that it was even approaching a $p < .05$ level was rather surprising. The researcher theorized that, just as with the age hypothesis, the status of the student as independent, (over 24 years old), or dependent, (less than 24 years old) has less to do with retention of that student than does the economic situation of the family or the need calculation used for awarding. To continue this vein of logic, the amount of need and the amount of awards were believed to be greater indicators for retention than was dependency status.

The model predicted the odds that 72 percent of dependent financial aid students versus 80 percent of independent financial aid students would be retained, but the relevancy of this information is debatable. Forty-six percent of the students receiving financial aid were dependent. Fifty-four percent of the students who received financial aid were considered independent so there were more independent students in the sample and, of course, more of the majority would be retained.

However, another dynamic could be involved with the greater retention of independent students and that was mentioned previously as the larger balance check incentive. Many students completing the FAFSA, or their social worker, parents, or grandmother helping them complete the FAFSA, attempt to prove that the student is independent because there is a 4,000 dollar loan difference depending on the outcome. This is one of the most complicated issues in a financial aid office; reading dependency appeals. This involves making a determination whether a student who is under 24 years old can be considered independent because of reasons that do not follow the federal guidelines which state; you must be married, or in the military, or financially supporting your offspring, or 24 years old to be considered independent by the federal government.

Because of the extra 4,000 in loans, they could qualify for, these students try to prove that they are independent for some varied reasons; 1) because they have a child (although it lives with the grandparents who support it), or because they no longer communicate with their parents, or because they do not know where their mother is and their grandmother raised them, or because their mother is dead and their father is in jail, or because they know their parents' adjusted gross income is too high for them to get anything but loans, so they try not to include them on the FAFSA. The parents' income

is one item that keeps many students at the community college where the study was conducted from qualifying for subsidized loans, because this college is located in a rather economically prosperous town where it is not unusual to see financial aid applications with parent incomes in excess of 100,000 dollars. Regardless of the dependency status of the student, even a millionaire's child can receive unsubsidized loans when he/she completes a FAFSA with all the required parental information.

Summary of Discussion

This study's findings revealed that receipt of federal Pell grants and federal loans do make a significant difference on retention rates. Pell grants ($p = .001$) and Stafford loans ($p = .000133$) were significantly and positively related to student retention. Unmet need ($p = .0003191$) was significantly negatively correlated with student retention. For the more demographic type of variables, the findings were as follows: 1) age ($p = .110$) was not significantly related to retention; 2) gender ($p = .027$) was significantly related to retention; 3) ethnicity ($p = .086$) was not significantly related to retention; 4) Grade Point Average ($p = .0000000000000003$) was strongly significantly related to retention; 5) year in school ($p = .165$) was not significantly related to retention; and 6) dependent or independent status ($p = .084$) was not significantly related to retention.

All of the hypotheses were supported except two. Hypothesis 5 – gender was not expected to matter and it did and Hypothesis 8 – year in school was expected to make a difference and it did not.

The two theoretical constructs which contributed to the framework for this study of retention were Tinto's Student Departure Model and Astin's Student Involvement Model. Vincent Tinto's model emphasized student characteristics and student environmental factors for departure (Tinto, 1993; Wilmer, 2009). Tinto's research examined the reasons students fail to graduate, with a parallel to social engagement theory, but he discovered it is the subsequent environmental events, such as having financial support, socially connecting with other students, and grasping the academic material, which will result in departure or graduation for the community college student (Tinto & Russo, 1994; Tinto & Love, 1995). Tinto's later studies acknowledge the possibility that finances could play a role in a student's decision to leave an institution and also involved community colleges (Tinto, 1999). The current study was evaluated in reference to Tinto's theoretical constructs and was found to support the measures of economic persistence theory he promoted. In short, Tinto's theory was validated by the present study.

On the contrary, Alexander Astin's theory of student retention focused on student involvement as an explanation of student development and retention (Bean, 1990; Astin, 1993; Wilmer, 2009). Astin (1999b) postulated his theory which was the measure of success for an educational policy or program should be based on its capacity for student involvement (1999b). His early research found that all the factors that positively influenced retention could be explained by his involvement theory, whereas the aspects that influenced loss of student enrollment were the results of lack of involvement (Astin, 1975). Fundamentally, Astin's theory dealt with *how* the student

develops and the effects that this development has on the student's long-term retention (Astin, 1999b).

The present study on financial aid and retention did not evaluate Astin's theory on measures other than GPA. The level of student involvement is ultimately indicated by the kind of grades they receive. The students who had higher GPA's in the current study had higher predicted rates of retention. Therefore, Astin's theory was validated, to some extent, by the present study.

This concludes a brief summary of the essential significant and non-significant findings of this study. All of the variables were addressed and the research questions were all answered, although many of them were not as predicted by the researcher. The implications for the findings and the non-findings will be addressed in the next section.

Implications of Findings

Practical Application for Community Colleges

The practical application for the knowledge generated by this study is to take to our community college campuses nationwide the news that financial aid plays a pivotal role in keeping students enrolled. Indeed, this is a heartening finding for the masses of jaded financial aid administrators who sometimes ponder if the aid they award makes a difference in the recipients' lives. From a very utilitarian standpoint, it validates our existence and vocation to know that the higher the amount of grants and loans we award, the greater the likelihood of meeting that student at graduation.

On the contrary, it is sobering to think that as students borrow increasingly higher dollar amounts in loans; their debt levels could adversely affect their life choices of a

career. It behooves the financial aid office and decision-makers at the administration level to realize these potentially negative consequences to offering a loan program to a sometimes low-income demographic. From an extremely pragmatic and rational viewpoint, institutions should scrutinize their graduation rate in relation to the amount of student borrowers they have and ask discerning questions such as, "Should we have a loan program at a community college where only 14 percent of our students will graduate and will have the needed credential to find employment to safely service the debt they have incurred?"

In summary, a more constructive application for this study would be to explore why GPA and academic preparation are still stronger retention predictors than amount of financial aid received. Could financial aid programs be better tailored to match the institutions and demographics they serve? For instance, every federal Pell grant program and federal loan program is identical across the nation at present. What if the federal aid programs could be better suited for the community college level by increasing grant and need based aid to such an extent that it eliminates the need for a loan program? This concludes the practical community college leadership application for the findings and turns us toward future research possibilities.

Practical Application for Public Policy

Since it was demonstrated in this study that grants were significantly and positively related to student retention, federal and state agencies should evaluate the idea of maintaining/increasing their budgets for need-based and even merit-based aid (due to academic performance at the college level, not the high school level) in the near future. It

serves little public good to offer increasingly higher amounts of loans to students every year when the federal government must assume and absorb the failure of those loans when they default due to non-repayment. It also serves little public good to offer public assistance indefinitely, with no stipulations in regard to achievement of credible objectives in life.

It serves a great deal more public good when more citizens attain a degree and are able to become contributing members of society, rather than as consumers of all forms of public assistance and programs unrelated to financial aid, but for whom financial aid offices are often misconstrued. If the assumption that more college graduates is an advantageous societal goal, then it follows that the logical course of action to stimulate such behavior would be to persuade federal, state, and institutional leaders (with statistics in hand) to commit a larger percentage of their resources to accomplishing this goal.

There has been a slow, but steady financial aid policy shift at the federal level for a number of years. The amendments to the Higher Education Act of 1965 have drifted the target of financial aid off of the neediest recipients and focused it ever more clearly onto the middle classes. An example of this is the removal of the value of the home or business (if you employ less than 100 staff) from the need calculation of the application for financial aid (FAFSA). Another example is the loan programs, in general. The original purpose for the creation of a federal student loan program was to assist the middle classes, who had too much income to qualify for grant aid, but no savings for college, to let their children borrow their way through school.

Several months before their senior's high school graduation these parents visit the financial aid office at their local community college and 'help' their child take out a loan,

promising their child in the loan officer's presence that they will 'help' them pay it back, but the loan is in the student's name. The student is responsible for repayment.

What often takes place, however, is the students who have already received the maximum award in the federal grant programs (5,000 + dollars), and who are the neediest of the student population, are then coming to the financial aid office and requesting their annual maximum in loans as well. This was not the original intention of the creators of the federal loan programs, but it is our current reality at the practical program level where federal policy collides with economic need.

The researcher submits that a better proposition would be to provide a greater percentage of grant awards and need-based state awards so large that the students' Cost of Attendance budgets would be filled and there would be no more room for a loan. Many of the leading institutions of higher learning (Harvard, Yale, and the University of Virginia) in the United State already have such financial aid policy in place.

<div align="center">Limitations</div>

First of all this research was limited by the number of participants (n < 346) in the study which derived from only one college. The intent was that a larger amount of data and participants would be available for analysis, but these 346 data records of student borrowers were all the researcher had access to as a study of convenience.

The main anticipated limitation for this research measure was the fact that the analysis encompassed aid recipients at one community college and therefore, results can not be generalized to other higher education institutions. A larger, random, study sample obtained from several different colleges would create results that could be

generalized beyond this one campus; however, this community college is comparable to others of its size and location, so it is conceivable for these results to be applicable to other community colleges in Virginia.

Other limitations were the dichotomous options for retention; the researcher would prefer scaled answers, such as number of credits completed after two semesters. Nevertheless, the institutional and financial aid data at this community college were tested and validated both internally and externally and were able to provide the necessary information to address the research questions.

The final limitation the researcher was aware of was the data set from only one year, rather than several years of awards and retention for comparison purposes. It is suggested by previous research (Tinto, 1993; Tinto, 1999; Tinto, 2004) on retention that a study of this nature should be longitudinal. If a researcher had access to several years of data, a cohort of students with similar demographic or economic background characteristics could be tracked from their freshman year through the next four to eight years to see the effects of regular annual financial aid upon retention.

The limitations of the present study lend themselves to the necessity for future research of this nature.

Recommended Research

The literature on retention suggests another variable that was not included in this study, but which was included in the institutional dataset used for the analyses in this research. That variable is number of developmental courses completed by the student as a predictor (negative) of retention. Retention research indicates that as the number of

remedial or development classes that a student attempts increase, the less likely they are to be retained through graduation. "...student who enrolled in at least one remedial or developmental course ... were 30 percent less likely to attain a credential than those students who did not require remediation," (Rogers, 2005, p. 114).

This is more of a statement on the less than ideal quality of high school educations that students are receiving before arriving at the college than it is of the quality of coursework expected by the college. The researcher recommends future studies of financial aid and retention that include the number of development credits attempted as a variable.

The researcher also recommends a longitudinal study of the effects of financial aid for different cohorts of students after four, six and eight years to further study loans and retention to/through graduation. In addition, the future research recommended for financial aid should be conducted at the community college level. There is enough research already at the over-studied university level in regards to retention. This existing knowledge of retention often does not apply at the community college level or to the community college student demographics.

There is simply not enough discussion about community colleges and less than two-year colleges despite the fact that a significant proportion of all college students attend such institutions (Rogers, 2005, p. 123). The American Association of Community Colleges reports that 44 percent of undergraduates in the United States are enrolled at community colleges (AACC, 2009). A case in point is the many research studies from universities that formed the conceptual framework for this current study, but were not validated at the community college level. For example, perhaps freshman

are more likely to be retained at the university level than sophomores, but this was not replicated at the community college level because of the significant institutional differences.

A final suggestion for future research on retention might be to study the impact of a comprehensive orientation program before students enroll in their first class. In other words, what predictor effects would the clarification of the institution's requirements, in regard to grades, attendance, assignments, etc., have on retention? If all students clearly understood that withdrawing from all their classes in one semester with resulting 'W's' on their transcript would result in a return of Title IV calculation, loss of future financial aid, and perhaps even a bill from the bursar's office for 'unearned' financial aid, maybe students would stay enrolled and utilize the complimentary tutoring services, etc.

Conclusion

This study clearly demonstrated that federal Pell grants and federal loans do make a significant difference on retention rates. Both the federal Pell grant and federal loans increased student retention rates, up 12 percent and 14 percent respectively. Retention until completion is the real benchmark of an institution's success. It is the bottom line for college administrators, state and national legislators, parents, and of course, the students themselves. Financial aid not only removes barriers for students to attend, it carries them all the way through, as long as their coursework is up to institutional and federal

standards. Financial aid administrators are crucial to the successful accomplishment of the mission of the college. The federal financial aid programs not only offer students an initial award to encourage enrollment, they see the students through to their journey's conclusion at the graduation platform – yes financial aid covers caps and gowns.

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Appendix A

Definition of Variables

ID	Age	Gndr	Eth	GPA	Year	Status	Unmet need	Grants?	Loans?	Retention?
1	32	fml	wh	3.2	Sphmr	Indpnt	$2800	$750	$6300	No (6cr "W")

ID refers to the case number of each student in the sample, rather than actual student identification number to protect the identity of students;

Age is noted by year of birth for each student and measured in years.

Gender is indicated by whether the student answered this question on their application as female, male, or unknown;

Ethnicity refers to whether the student indicated on their application that he/she was White, Black, Hispanic, American Indian, Asian, Pacific Islands, other, or did not specify;

GPA or Grade Point Average is noted on a 0-4.0 scale, with all incoming freshman having GPA of 0 at the college level;

Year, as a variable, indicates the student's grade level in college, as either freshman or sophomore at this particular community college;

Status refers to the federal financial aid requirements for considering the student as dependent or independent. Dependent status is defined for federal financial aid as students who are 23 years of age or younger and independent status is attained by qualifying as one of the following a) 24 years of age or older, b) married, c) a member of the military, d) an orphan or ward of the court, or e) financially providing for the needs of their own dependent children;

Appendix A – Continued

Unmet Need refers to the remaining fiscal need in a student's financial aid budget after deducting the Expected Family Contribution number from the FAFSA and then subtracting all financial aid funds received (See Appendix B for actual budgets);

Grant as a variable is defined as the federal Pell grant and is measured by dollar amount of Pell grants received in the fall and spring semesters together, since financial aid amounts are awarded once for the year and offered in total before the academic year starts in the fall.

Loan as a variable is defined as the federal FFELP Stafford loan and is measured by dollar amount of Stafford Loans received in the fall and spring semesters together as one total for the award year.

Retention as a variable is defined by whether the student remained enrolled from the beginning of the fall semester through the end of the following spring semester and is measured by completed credits for each semester – fall 2008 and spring 2009. If a student successfully completed even one class with a passing grade of A, B, C, D, P, or S during the spring semester, the retention variable for two semesters will be scored as "yes."

Appendix B

Financial Aid Budget and Packaging Examples

Full-time Dependent Student Budget EFC of 0:

School Cost of Attendance = **$10,886**

Minus - Student's Expected Family Contribution = $0

Minus - Pell Grant Student is Awarded = $5,350

Minus – Stafford Subsidized Loan at Freshman Amount = $3,500

Minus – Stafford Unsubsidized Loan at Dependent Amount = $2,000

Student's Financial Unmet Need = $36

Student received **$10,850** in Federal Financial Aid for the Year.

Student's instate tuition rate **(actual bill) was $2,288.40** for 24 credits.

Student's cash refund checks totaled: **$8,561.60**

Full-time Independent Student Budget EFC of 0:

School Cost of Attendance = **$14,786**

Minus - Student's Expected Family Contribution = $0

Minus - Pell Grant Student is Awarded = $5,350

Minus – Stafford Subsidized Loan at Freshman Amount = $3,500

Minus – Stafford Unsubsidized Loan at Ind. Amount = $5,936

Student's Financial Unmet Need = $0

Student received **$14,786** in Federal Financial Aid for the Year.

Student's instate **tuition rate was $2,288.40** for 24 credits.

Student's cash refund checks totaled: **$12,497.60**

Appendix B - Continued

Half-time Independent Student Budget EFC of 4,000:

School Cost of Attendance = **$14,786**

Minus - Student's Expected Family Contribution = $4,000

Minus – Stafford Subsidized Loan at Freshman Amount = $3,500

Minus – Stafford Unsubsidized Loan at Ind. Amount = $6,000

Student's Financial Unmet Need = $1,286

Student received **$9,500** in Federal Financial Aid for the Year.

Student's instate **tuition rate was $1,144.20** for 12 credits.

Student's cash refund checks totaled: **$8,355.80**

Half-time Independent Spring Only Budget EFC of 4,000:

School Cost of Attendance = **$7,393**

Minus - Student's Expected Family Contribution = $4,000

Minus – Stafford Subsidized Loan at Freshman Amount = $1,750

Minus – Stafford Unsubsidized Loan at Ind. Amount = $3,000

Student's Financial Unmet Need = $0

Student received **$4,750** in Federal Financial Aid for the spring

Student's instate **tuition rate was $572.10** for 6 credits.

Student's cash refund checks totaled: **$4,177.90**

Appendix C

Code Listing for All Variables

Category	Variable	Variable Type	Coding
Outcome			
	Retention	Categorical	0 = not retained, 1 = student retained
	Number of Credits	Continuous	Number of credits receiving passing grades
Demographic Characteristics			
	Age	Continuous	Years of age as of fall 2008
	Gender	Categorical	1 = male, 2 = female
	Ethnicity	Categorical	0 = other, 1 = Caucasian
	Grade Point Average	Continuous	Numerical data from 0-4.0
	Year in School	Categorical	1 = freshman, 2 = sophomore
	Dependency Status	Categorical	1 = dependent, 2 = independent
Financial Aid and Unmet Need in Budget			
	Received Grants	Categorical	0 = no, 1 = yes
	Amount of Grant Aid	Continuous	Dollar amount
	Amount of Federal Loan	Continuous	Dollar amount
	Amount of Unmet Need	Continuous	Dollar amount

Appendix D

Permissions from IRB and from the Institution

Eunice R. Wine

From:	Burnett, Dana D. [dburnett@odu.edu]
Sent:	Thursday, October 14, 2010 12:14 PM
To:	Eunice R. Wine
Subject:	Human Subjects Review Board

Eunice,

The Human Subject Review Board has found your study to be exempt. Letter will follow shortly. You may proceed!

Dana D. Burnett
Professor of Higher Education &
Interim Chair
Department of Educational Foundations &
Leadership
Old Dominion University
Norfolk, Va 23 529
(804) 683-5161

Eunice R. Wine

From:	Tara Atkins-Brady
Sent:	Friday, October 29, 2010 7:59 AM
To:	Eunice R. Wine
Subject:	research

Eunice,

I have reviewed the proposal and IRB documentation for your study titled "Financial Aid as a Predictor Variable to Retention at a Virginia Community College." Your request to utilize PVCC data in this research is approved. Best wishes for success in your research.

Tara L. Atkins-Brady, Ph.D.
Director of Institutional Research, Planning, and Institutional Effectiveness
Piedmont Virginia Community College
501 College Drive
Charlottesville, VA 22902-7589
434.961.5301 (office)
434.971.8232 (fax)
tatkins-brady@pvcc.edu
www.pvcc.edu

PVCC

Vita

EDUCATION

Doctorate of Philosophy in Community College Leadership

    Old Dominion University, Norfolk, VA   May 2011

Master's of Science in Journalism

    West Virginia University, Morgantown, WV   May 2004

Bachelor's of Science in Journalism

    West Virginia University, Morgantown, WV   August 2002

ACADEMIC PUBLICATIONS

- Wine, E. (2011). Financial Aid as Retention Predictor: Financial Aid's Relationship to Retention at a Virginia Community College. *Electronic Thesis and Dissertation Service.* Old Dominion University. (1-198).
- Rohrer, E. (2004). Vernon Knode II – book chapter and black and white photography for this patient. In Cancer Stories: Lessons in Love, Loss, and Hope. *West Virginia University Press,* (96-121). ISBN 0-937058-88-2.
- Rohrer, E. (May, 2004). The Old Order Mennonites and mass media: Electronic media and socialization. *Electronic Thesis and Dissertation Service.* West Virginia University. (1-130).
- Rohrer, E. (January, 2003). Military censorship and the United States press: Comparing the Vietnam and Persian Gulf wars. *WVU McNair Scholars Research Journal.* (90-100).

SCHOLARLY PRESENTATIONS

- Presented a dissertation defense entitled, *Financial Aid as Retention Predictor: The Relationship of Financial Aid to Retention at a Virginia Community College,* Norfolk, VA, April 2011.
- Presented a quantitative dissertation proposal entitled, *Financial Aid as Retention Predictor: Financial Aid's Relationship to Retention at a Virginia Community College,* Charlottesville, VA, June 2010.
- Presented an interactive demonstration entitled, *The Community College Leadership Doctoral Program.* New Horizons Conference, Roanoke, VA, March 2006.
- Presented a quantitative research project entitled, *Statistical Analyses for the Women's Center Survey.* Tidewater Community College, Norfolk, VA, October 2005.
- Presented a thesis defense entitled, *The Old Order Mennonites and mass media: Electronic media and socialization,* at West Virginia University, Morgantown, WV, April 2004.
- Presented a research project entitled, *Military Censorship and the United States Press: Comparing the Vietnam and Persian Gulf Wars,* at a national McNair Scholars Conference at the University of Maryland, Bethesda, MD, March 2002.

MEMBERSHIPS HONORS AND AWARDS

- NASPA-Student Affairs Administrators in Higher Education – 2009
- American Association of Community Colleges – 2009
- National Association of Student Financial Aid Administrators – 2007
- Southern Association of Student Financial Aid Administrators – 2007
- Virginia Association of Student Financial Aid Administrators – 2007
- Kappa Tau Alpha – 2002
- Ogden Nutting Newspapers Scholarship – 2001 to 2002
- Edith Sasser Journalism Scholarship – 2000-2001 and 2001-2002
- Gamma Beta Phi – 2001
- McNair Scholar – 2001
- Society of Professional Journalists – 1999

EXPERIENCE

Assistant Director of Financial Aid/Loan Officer   2007 – Present
Piedmont Virginia Community College, Charlottesville, Virginia

- Manage all aspects of the Financial Aid office in the absence of the Director.
- Supervise three FT and three PT Financial Aid staff members.
- Responsible for managing the Federal Family of Education Loan program and processed all FFELP Stafford loan requests from application through disbursement for three years.
- Responsible for the smooth transition to the Ford Federal Direct Loan program in July of 2010 and processing all Direct Stafford loan requests from application through disbursement for the past year.
- Manage all aspects of the Federal loan programs at PVCC, including handling return funds for Title IV. Also handle 30-day reconciliation processes for loan programs.
- Hold regular in-person counseling sessions in my office with student borrowers for loan entrance/exit counseling and special circumstances.
- Hold regular large and small group sessions for entrance and exit loan counseling sessions and explain all aspects of deferment and repayment.
- Am available and assist in teaching Financial Literacy Basics to students in Student Development courses each semester.
- Responsible for assuring the proper processing all FAFSA applications in PeopleSoft Student Information System from receipt by school through award packaging.
- Responsible for Financial Aid website updates and electronic document management system.

Financial Aid Special Projects Coordinator   June 2007 – Sept. 2007
Piedmont Virginia Community College, Charlottesville, Virginia
- Consultant for records management and office processes.
- Responsible for PeopleSoft Student Information Systems data management.
- Point-person and trainer for Student Services Call Center.
- Supervised four Student Services Call Center representatives.
- Responsible for Financial Aid website updates and electronic document management system.

Vice President Assistant/Doctoral Internship   Aug. 2006 – May 2007
Piedmont Virginia Community College, Charlottesville, Virginia
- Gained skills in administrative-level decision-making and participatory governance by attending the President's Cabinet weekly meetings, and VPFAS staff meetings.
- Worked with capital – outlay planning, construction projects and edited the main building signage schedule for 300+ new signs.
- Observed Finance/Budgeting operation at PVCC and assisted with data analysis/input.
- Assisted with the content, construction, and maintenance of the VPFAS web pages including the Electronic Policy Manual, Security Office, Business Office, Human Resources, and electronic forms.
- Provided analytical and technical staff support to the Vice President and the PVCC Security Office on campus security, parking, emergency planning, and safety.

Marketing/Media Graphics Designer   Aug. 2006 – May 2007
Piedmont Virginia Community College, Charlottesville, Virginia
- Worked as a team with Institutional Advancement and Development staff to produce quality publications and all internal business cards.
- Designed and formatted the College Catalog, Semester Course Schedule, and newspaper advertisements for PVCC.
- Designed the Educational Foundation newsletter, profile, and holiday card.

GRA/Program Coordinator   Aug. 2005 – July 2006
Old Dominion University, Norfolk, Virginia
- Coordinated the Summer Institute two-week on-campus experience for Ph.D. students.
- Designed presentations, workshops and a series of marketing brochures.
- Edited the Higher Education and Community College Leadership websites.
- Assisted students through face-to-face discussions, by phone and e-mail.
- Designed and posted interactive course materials for Blackboard.

English Teacher   June 2004 – May 2005

David's English Center, Taipei, Taiwan

- Taught Taiwanese adults and teenagers in communicative and grammatical English for an average of 20 teaching hours per week.
- Designed interactive English courseware and tutored for the GEPT and TOEFL exams.
- Edited office documents as needed and voice-recorded two new *Lifestyles* textbooks.

Managing Editor   Aug. 2002 – May 2004

West Virginia University, Morgantown, West Virginia

- Coordinated and supervised the electronic production of a monthly newspaper.
- Held regular staff meetings and workshops to train new staff-writers and copy-editors on electronic production and writing in AP style.
- Edited every issue of the newspaper for content and grammar.

GA/Program Assistant   Aug. 2002 – May 2004

West Virginia University, Morgantown, West Virginia

- Coordinated monthly workshops on varying research topics and personal enrichment activities for the WVU McNair Scholars.
- Coordinated campus visits and research conference visits to other colleges and universities out of state to prepare our scholars for graduate school.
- Designed, edited and published the first edition of the *WVU McNair Scholars Research Journal*.
- Recruited new McNair Scholars and provided marketing support materials.
- Tutored University undergraduates to prepare for their GRE Writing exams.

TECHNOLOGY SKILLS

- PeopleSoft Student Information System 8.9 database maintenance, all Financial Aid processing, demographic data processing, and queries.
- All Microsoft Office applications for PC or Macintosh
- Quark Xpress 4.1-6.1, Adobe Pagemaker 7.0, Adobe Professional
- Adobe Photoshop 5-CS, Illustrator, InDesign
- Front Page webpage design, Blackboard course posting
- FlashMX, SwishMax and TrainerSoft Instructional Design courseware
- Statistical analysis in SAS and SPSS 11.0-15.0 and practiced usage of WeaveOnline

LANGUAGE SKILLS

- Some spoken/written Spanish
- Some spoken Mandarin Chinese