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AUTHOR	DuBrock, Caryl Pritsker
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ABSTRACT

This study explored the role of financial aid in promoting year-to-year persistence over a five-year period following reauthorization of the Higher Education Act in 1992. The study cohort included 6,711 full-time beginning freshmen in the fall 1993/1994 terms at Arizona State University. Variables examined were (1) effects of receiving any financial aid, (2) amount of financial aid, (3) amount of debt, and (4) type of debt. The study found that receipt of aid had a positive influence on persistence, although only in the second-to-third year when aided students were more than twice as likely to return; amount of aid had a significant effect in the first three years, with the odds of persisting increasing from 4 to 12 percent per $1,000 of additional aid; amount of debt has a positive and significant effect in the first three years, with a student having more than $1,000 of debt being 2 to 8 percent more likely to return; unsubsidized debt was negatively associated with persistence in each transition period, although not at a significant level. The paper concludes that the 1992 financial aid program promotes year-to-year persistence, and that the amount and type of debt assumed by students has not had a significantly negative impact on retention. (Contains 26 references.) (CH)

FINANCIAL AID AND COLLEGE PERSISTENCE:

A FIVE-YEAR LONGITUDINAL STUDY OF 1993 AND 1994 BEGINNING FRESHMEN STUDENTS

Caryl Pritsker DuBrock, Ed.D.
Author
1412 North Pasadena Street
Mesa, Arizona 85201
CarylDuBrock@aol.com

Robert H. Fenske, Ph.D.
Presenter
Professor of Higher Education
Division of Educational Leadership and Policy Studies
Arizona State University
Tempe, Arizona 85287-2411
Robert.Fenske@asu.edu

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FINANCIAL AID AND COLLEGE PERSISTENCE:

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Abstract

The increasing student financial aid expenditures, higher loan limits, and growing dominance of loans over grants since the 1992 reauthorization of the Higher Education Act renewed the debate concerning the role of financial aid in promoting persistence. This research explored the role of financial aid in promoting year-to-year persistence over a five-year period after the 1992 reauthorization.

The study cohort (N=6,711) was defined as full-time beginning freshmen in the fall terms of 1993 and 1994 at Arizona State University, a public research university. Within the conceptual framework of the Persistence Model developed by St. John, Kirshstein and Noell (1988, 1991), logistic regression models of year-to-year persistence were used with extant institutional data. The effects of receiving any financial aid, the amount of financial aid, the amount of debt, and the type of debt on persistence were assessed while controlling for other determinants of persistence: demographic characteristics, precollege attributes, and college experience factors.

In the first model, the receipt of aid was consistently a positive influence on persistence. It was, however, significant only in the second-to-third year when aided students were almost twice as likely to return. In the second model with only aided students, the amount of aid had a significant effect in the first three years. The odds of persisting increased from 4% to 12% per $1,000 in additional aid.

For those students with debt in the third model, the amount of debt was a positive and significant factor in the first three years. A student with an additional $1,000 of debt was 2% to 8% more likely to return. Although not significant, the amount of debt was also positive in the final year. In the fourth model exploring the effects of the type of debt, having unsubsidized debt was negatively associated with persistence in each transition period but not at a significant level.

These findings confirm that financial aid awarded under the 1992 reauthorization programs promotes year-to-year persistence. The type and amount of debt assumed by students has not had a significantly negative impact on retention.

FINANCIAL AID AND COLLEGE PERSISTENCE: A FIVE-YEAR LONGITUDINAL STUDY OF 1993 AND 1994 BEGINNING FRESHMEN STUDENTS

As stated in the 1965 Higher Education Act, the underlying goal of this country's higher education policy is educational attainment. To implement this policy, the federal government's principal strategy is to ensure equal educational opportunity for all academically qualified citizens, regardless of their ability to pay, by providing student financial aid. This research provides a current examination of the role of financial aid in persisting until attainment of a college degree.

The 1992 reauthorization of the Higher Education Act broadened the eligibility for need-based aid and added new opportunities for unsubsidized loan borrowing (DeLoughry, 1992; Fenske & Gregory, 1994). Key changes in the 1992 reauthorization included the revision in the methodology used to establish financial need, changes in the definition of dependency status, and the establishment of unsubsidized loan opportunities for dependent students. The 1992 reauthorization also raised the annual and aggregate loan limits for borrowing.

These changes had an immediate impact on federal financial aid expenditures. McPherson and Schapiro (1998, p. 30, 35) describe the growth in loans as "enormous" as federal loan expenditures rose almost $9 billion dollars from 1992-93 to 1994-95. This represented a 57% increase in adjusted dollars for the first two years of the new aid regulations. During this same time period, they note Pell grant expenditures dropped 13% in adjusted dollars. In 1995-96, about one-fourth of all undergraduates took out a loan, borrowing an average of $4,100 (National Center for Education Statistics [NCES], 1998, p.29). NCES reports that half of the dependent students with Stafford loans borrowed the maximum amount.

By 1997-98, total student financial aid expenditures exceeded $60.5 billion with over 72% of this total funded by the federal government (Chronicle of Higher Education, 1999, p. 21). Institutions actively monitor the changes in federal aid regulations and programs. These federal changes are incorporated into the institution's financial aid goals and programs. These institutional aid and packaging policies are used as tools to meet institutional strategic goals especially in the areas of recruitment, enrollment management and retention.

Financial aid programs are the primary vehicles to ensure economic status is not a barrier to completing a college degree program. The primary question is, are the recent changes in federal financial aid programs promoting or hindering the educational attainment of today's students?

Statement of the Problem

The primary focus of this research is to examine the relationship between financial aid and year-to-year institutional persistence. The impact of receiving any financial aid, the amount of financial aid and the timing of financial aid on persistence is assessed while measuring and controlling for a number of other key factors of educational success: demographic factors, precollege attributes (academic preparation and ability), and college experience factors (academic and social integration). This study uses five years of longitudinal data for new freshmen entering a 4-year public research institution in the fall terms of 1993 and 1994, the first two freshmen classes to experience the dramatic changes in student aid programs due to the 1992 reauthorization of the Higher Education Act.

The problem statement has been operationalized into the following primary research questions:

What is the relationship between the receipt of financial aid and year-to-year persistence?

What is the relationship between the amount of financial aid received and year-to-year persistence?

What is the relationship between the amount of cumulative debt and year-to-year persistence?

What is the relationship between the type of cumulative debt and year-to-year persistence?

The analyses that address these questions provide a rigorous, longitudinal evaluation of financial aid programs after the 1992 reauthorization of the Higher Education Act in promoting educational attainment. Although some important cross-sectional studies have recently been conducted (e.g., Cofer, 1998; Cofer & Somers, 1997, 1998, 1999) and a smaller number of longitudinal persistence studies focusing on the first years of attendance have been reported (e.g., Fenske, Dillon, & Porter, 1997), longer term longitudinal examinations of the 1992 reauthorization have not been reported.

Research Design and Methodology

The study's research questions are addressed by operationalizing an institutional model of year-to-year persistence using extant institutional data. The model used in this research was designed according to the specifications outlined for building institutional year-to-year persistence models in St. John, 1992, Somers, 1995, and Somers & St. John, 1997.

Persistence, the outcome or dependent variable, is defined as the decision to re-enroll in the subsequent year. The independent variables for this research are categorized into four main classifications—entering demographic characteristics, precollege attributes, college experience, and financial aid. Therefore, this basic model states a student's decision to persist is a function of the student's entering demographic characteristics, precollege attributes, college experience, and financial aid.

The entering demographic characteristics are age at entry, gender, ethnicity, financial aid dependency status, and need status at entry. The precollege attributes of academic preparation and ability are represented by high school GPA and college admission test scores. The college experience factors originally selected were the number of enrolled hours, college GPA, entering college major, living on campus, and working on campus. Exploration of the data and initial runs of the models revealed problems with the interaction among variables and multicollinearity among the predictors, especially with the two college experience variables of college GPA and enrolled hours. The unstable results and biased estimates resulted in a revision of the initial model that excluded college GPA and enrolled hours. Therefore, the college experience variables are limited to entering major, living on campus, and working on campus.

The financial aid measures are the receipt of aid, the total amount of aid, the amount of cumulative debt, and the type of cumulative debt. Control factors are the year of entry, financial aid dependency status, and state residency status.

Using these variables, four versions of the basic model are used for each year in order to provide an overview of the role of financial aid. Model 1 explores the relationship between receiving any financial aid and persistence while measuring and controlling for the non-aid variables. Model 2 examines the

relationship between the amount of total aid and persistence. Model 3 probes the relationship between the amount of total debt and persistence, while Model 4 looks at the relationship between the type of debt and persistence.

Model 1 Receipt of Any Financial Aid

$Persistence_t = f$ (demographic characteristics, precollege attributes, college experience $factors_t$, receipt of any financial aid_t)

Model 2 Amount of Total Financial Aid

$Persistence_t = f$ (demographic characteristics, precollege attributes, college experience $factors_t$, amount of financial aid_t)

Model 3 Amount of Cumulative Debt

$Persistence_t = f$ (demographic characteristics, precollege attributes, college experience $factors_t$, amount of cumulative $debt_{t,}$)

Model 4 Type of Cumulative Debt

$Persistence_t = f$ (demographic characteristics, precollege attributes, college experience $factors_t$, type of cumulative $debt_{t,}$)

Statistical Methods

The data analyses include descriptive and inferential statistics to provide a student profile and overview of persistence for the study cohort and nonlinear regression to explore the multiple factors of persistence. Chi square tests and one-way analysis of variance tests are used to examine the significance of entering characteristics on persistence status five years after entry. A logistic regression model with multiple explanatory variables is used to develop a predictive model of persistence. Since the late 1980s, logistic regression has become the dominant statistical technique for analyzing the influence of financial aid on enrollment, persistence or graduation (e.g., Stampen & Cabrera, 1986; St. John & Noell, 1989; Cabrera, Stampen & Hansen, 1990; St. John, Kirshstein & Noell, 1991; Murdock, Nix-Mayer & Tsui, 1995; Somers, 1992; and Cofer & Somers, 1997, 1998, 1999). The results of these studies have verified that logistic regression is a viable statistical technique for studying a phenomenon such as the

influential factors of persistence as it aptly handles a dichotomous dependent variable with multiple explanatory variables that are continuous and categorical.

This research uses inverse odds-ratios or IORs. The translation of odds-ratios associated with independent variables negatively related to the dependent variable into inverse odds-ratios was developed by DesJardins (1999). The inverse odds-ratio is calculated as 1/[exp (β)] when β is negative or 1/odds-ratio when the odds-ratio is less than 1.0 (DesJardins, 1999, pp. 5-6). The odds-ratio and inverse odds-ratios were calculated only for those independent variables found to be significant. For this research, the significance level cutoff is $p < .05$.

Data Analyses and Results

This section presents the results from the data analyses conducted for this research. The first portion provides an overview of the study population using descriptive and inferential statistics to describe the student characteristics and persistence status at the end of five years. The second portion reports the odds-ratio of persisting or the inverse odds-ratio of not persisting for each variable found significant in the logistic regression analyses.

Characteristics of the Study Population

The initial analyses used descriptive and inferential statistics to examine the distribution of the variables and to provide an overview of the characteristics of students who persisted or graduated and did not persist after five years from entry. As summarized in Table 1, 55.2% of the 6,711 students in the study population had graduated or were still enrolled five years after entry. Since the study population included two fall entering cohorts, the year of entry was examined to discern any influence. The fall 1994 cohort was slightly larger, comprising 53.7% of the study population. The rates of completion or continued persistence were almost identical for the two cohorts. There was no significant difference in the persistence status five years after entry ($\chi^2 = .005$, 1*df*, $p = .946$) by cohort year.

Overview of the Demographic Variables. Age was significantly related to persistence status five years after entry ($F = 3.013$, 23*df*, $p = .000$) with younger students faring better than older students. Females represented 51.1% of the study population and registered a higher overall persistence rate than males (57.3% to 53.0%). Gender, therefore, was found to be significant ($\chi^2 = 12.829$, 1*df*, $p = .000$).

A student's ethnicity or racial classification was highly significant in predicting overall persistence (χ^2 =48.685, 4*df*, *p*=.000). Each of the three underrepresented minority groups posted lower successful persistence rates at the end of five years (American Indians 35.4%, African Americans 43.9%, and Hispanics 52.4%) than Asian Americans (63.2%) and Whites (56.1%).

Table 1. First-Year Characteristics of 1993 and 1994 Freshmen by Persistence Status Five Years After Entry

Variable	n	% of Cohort	Completing or Persisting	Not Persisting	Statistical Significance
Total	6,711	100.0	55.2%	44.8%	
Cohort Year Effect					χ^2=.005, 1*df*, *p*=.946
Fall 1993	3,107	46.3	55.1%	44.9%	
Fall 1994	3,604	53.7	55.2%	44.8%	
Age at entry					F=3.013, 23*df*, *p*=.000
18.1 mean	6,711	100.0	18.0 mean	18.2 mean	
Gender					χ^2=12.829, 1*df*, *p*=.000
Male	3,282	48.9	53.0%	47.0%	
Female	3,429	51.1	57.3%	42.7%	
Ethnicity					χ^2=48.685, 4*df*, *p*=.000
African American	198	3.0	43.9%	56.1%	
Hispanic	737	11.0	52.4%	47.6%	
American Indian	161	2.4	35.4%	64.6%	
Asian American	348	5.2	63.2%	36.8%	
White	5,267	78.5	56.1%	43.9%	
Socioeconomic Status					χ^2=8.414, 1*df*, *p*=.004
Needy	1,375	20.5	51.7%	48.3%	
Non-needy	5,336	79.5	56.1%	43.9%	
High School GPA					F=14.770, 28*df*, *p*=.000
3.1 mean	6,630	98.8	3.2 mean	3.0 mean	
SAT Score					F=1.645, 93*df*, *p*=.000
1070 mean	6,525	97.2	1,080 mean	1,058 mean	
Entering Major					χ^2=.387, 1*df*, *p*=.534
SEM	1,413	21.1	55.9%	44.1%	
Non-SEM	5,298	78.9	55.0%	45.0%	
1st Year Enrollment Hours					F=31.069, 28*df*, *p*=.000
26.3 mean	6,711	100.0	27.9 mean	24.4 mean	
1st Year Live on Campus					χ^2=1.218, 1*df*, *p*=.270
Yes	4,036	60.1	55.7%	44.3%	
No	2,675	39.9	54.4%	45.6%	
1st Year Work on Campus					χ^2=19.366, 1*df*, *p*=.000
Yes	830	12.4	62.3%	37.7%	
No	5,881	87.6	54.2%	45.8%	
1st Year Financial Aid					χ^2=.210, 1*df*, *p*=.646
Yes	3,965	59.1	55.4%	44.6%	
No	2,746	40.9	54.8%	45.2%	
1st Year GPA					
2.4 mean	6,711	100.0	2.8 mean	1.9 mean	F=5.725, 363*df*, *p*=.000

For the socioeconomic status measure, 20.5% of the student population were students who received a Pell grant during the first year. These Pell students, who come from the lowest income bracket, persisted after five years at a rate of 51.7% compared to the non-Pell recipients' rate of 56.1%. This measure of socioeconomic status was found to be significant (χ^2 =8.414, 1*df*, *p*=.004) in five-year persistence outcomes.

Overview of the Precollege Attributes. Completers or persisters after five years had a mean high school GPA of 3.2 while those not persisting had a mean high school GPA of 3.0. High school GPA was found to be significant in predicting long-term persistence outcomes (F=14.770, 28*df*, *p*=.000). Completers and persisters after five years scored a mean of 1,080 on the SAT while non-persisters had a mean SAT score of 1058. SAT scores were significantly related to persistence status five years later (F=1.645, 93*df*, *p*=.000).

Overview of Other First-Year Characteristics. Entering major, a constant college experience variable, was classified into two broad categories—science, engineering and mathematics (SEM), and all other majors (non-SEM). Entering SEM majors represented 21.1% of the student population. After five years, 55.9% of the entering SEM majors had graduated or were still persisting compared to 55.0% of the non-SEM majors. Therefore, entering major was not found to be significant in overall persistence status (χ^2 =.387, 1*df*, *p*=.534).

The number of hours enrolled during the first year was significant (F=31.069, 28*df*, *p*=.000) as non-persisters averaged 24.4 hours in the first year compared to 27.9 hours for persisters. Living on campus during the first year was not found to be significant (χ^2 =1.218, 1*df*, *p*=.270) as the campus residents' five-year persistence rate was 55.7% compared to 54.4% for off-campus students. Yet, working on campus during the first year did have a positive relationship with overall persistence (χ^2 =19.366, 1*df*, *p*=.000). Student workers on campus graduated or were still enrolled five years later at a rate of 62.3%, versus the 54.2% rate of students not on the campus payroll.

Receipt of financial aid during the first year was not significantly associated with persistence status five years after entry (χ^2 =.210, 1*df*, *p*=.646). The persistence rate for aid recipients was 55.4% compared to 54.8% for non-aided students. First-year cumulative college GPA was significant (F=5.725, 363*df*,

p=.000) as those students completing or still enrolled five years later had a first-year mean GPA of 2.8 compared to 1.9 for non-persisters.

Overview of Financial Aid Characteristics by Year of Enrollment. A majority of the enrolled study population received financial aid, ranging from a high of 59.1% in the first year to a low of 54.9% in the second year. As detailed in Table 2, the average award increased from $5,422 in the first year to $6,689 in the fourth year posting yearly increases from 7.0% to 10.0%. The composition of the awards by type of aid, however, shifted. Average grant awards were the highest in year one ($2,421) with 42.6% of all aided students receiving grant aid. By year four, less than one-third of the aided students (32.4%) were awarded grants. The average scholarship and waiver award increased each year from a low of $2,314 in year one to $3,449 in year four. Yet, the percentage of aided students receiving scholarships and waivers dropped from 64.4% of the enrolled aided students in year one to 31.2% in year four.

Loan awards increased each year in both average dollars and the percentage of enrolled aided students that borrowed. Over half of the first-year aided students (53.7%) assumed loans at an average amount of $5,187. By the fourth year, 64.2% of the enrolled aided students borrowed with an average loan amount of $6,710. Over three-quarters of the students borrowing each year received subsidized loans with the average subsidized loan steadily increasing from $2,646 in year one to $4,363 in year four. Less than 40% of the borrowing students each year took on unsubsidized loans but the average unsubsidized loan values were much higher.

Work-study, the other self-help form of aid, was much less common. Less than 6% of all aided students participated in work-study in any year. The average work-study awards ranged from a low of $2,132 in year one to a high of $2,918 in year three.

The bottom of Table 2 reports the accumulated debt of all enrolled students at the end of each year, regardless if they received aid in that particular year. The average accumulated debt rose from $5,187 with 31.7% of all enrolled students borrowing by the end of year one to an average of $16,440 with 45.9% of the enrolled students borrowing sometime in their college attendance by the end of year four. The number and percentage of enrolled students with unsubsidized debt fell dramatically each year from year one while the average debt accumulated from unsubsidized loans grew.

Overall, the distribution of financial aid indicates that the majority of the study population received some form of financial aid each year. Gift aid in the form of grants or scholarships and waivers were more common in the first years. Both the percentage of aided students borrowing and average dollar amounts of loans steadily grew each year. The overwhelming majority of those borrowing had subsidized loans. Much fewer students accepted unsubsidized loans, but took out larger loans.

Table 2. Financial Aid Characteristics by Year of Enrollment

Financial Aid Factors	First Year Enrolled (n=6,711)		Second Year Enrolled (n=4,629)		Third Year Enrolled (n=3,993)		Fourth Year Enrolled (n=3,813)	
	n	% or mean	n	% or mean	n	% or mean	n	% or mean
Received Any Aid	3,965	59.1%	2,540	54.9%	2,285	57.2%	2,183	57.3%
Total Award	3,965	$5,422	2,540	$5,684	2,285	$6,250	2,183	$6,689
Dependency Status								
Dependent	3,821	96.4%	2,429	95.6%	2,143	93.8%	1,992	91.3%
Independent	144	3.6%	111	4.4%	142	6.2%	191	8.7%
Residency Status								
In-state	2,498	63.0%	1,726	68.0%	1,617	70.7%	1,574	72.1%
Out-of-state	1,467	37.0%	814	32.0%	668	29.3%	609	27.9%
Total Grant	1,688	$2,421	949	$2,403	823	$2,243	708	$2,358
Total Scholarships & Waivers	2,553	$2,314	1,378	$2,562	1,186	$2,756	689	$3,499
Total Loans	2,128	$5,187	1,489	$5,374	1,399	$6,141	1,401	$6,710
Subsidized Loans	1,824	$2,646	1,238	$3,087	1,130	$3,916	1,098	$4,363
Unsubsidized Loans	829	$5,249	555	$4,898	521	$4,668	542	$4,834
Work Study	212	$2,132	145	$2,604	113	$2,918	76	$2,752
Debt	2,128	$5,187	1,702	$9,037	1,676	$12,701	1,751	$16,440
Debt from Unsubsidized Loans	829	$5,249	422	$9,566	292	$13,320	230	$17,311

Logistic Regression Analyses of Persistence Characteristics

This section summarizes the results of the logistic regression analyses for each of the four research questions. For each question, the key logistic regression results--the beta coefficient (ß), the *p* value, and the log odds or exponent of the beta coefficient--for each variable in the models for each of the four

transition periods (P_{1-2}, P_{2-3}, P_{3-4}, and P_{4-5}) were calculated as were the goodness of fit measures. This paper summarizes those results by presenting the odds-ratio or inverse odds-ratio for each variable found to be significant in each transition period for each research question.

Model 1 Effects of Receiving Any Financial Aid. A longitudinal summary of the variables in the model examining the effects of receiving any financial aid is provided in Table 3. The odds of a particular persistence status are calculated for those variables found to be significant at least $p<.05$. The odds-ratio of persisting is the rounded value of the log odds or exp(ß) in the logistic regression results tables for each significant variable with a positive beta coefficient. The inverse odds-ratio, or odds of not persisting, is calculated as 1/ [exp(ß)] for each significant variable with a negative beta coefficient.

Among the demographic variables (age, gender, ethnicity, and low-income or need status), only age was not a significant factor in any year. In the first year, American Indians were 2.17 times less likely to persist to the second year compared to all other students. Hispanic students were 1.51 times as likely not to return for the fourth year. African Americans and Hispanics were less likely to return for the fifth year (2.81 times and 1.54 times respectively).

The persistence patterns by gender varied during the first three periods. Females were more likely to return the second and fourth years compared to males (1.15 times and 1.34 times respectively). Yet, females were 1.54 times less likely to return the third year compared to males. The odds of persisting in the first two transition periods for needy students were negative. Needy students were 1.19 times as likely not to continue to the second year. By the end of the second year, needy students were 1.46 times as likely not to return for the third year.

High school GPA was significant in each transition period. A student with a GPA one-tenth of a point higher was 1.08 times, or 8%, more likely to re-enroll during the second year. In the later years, the increased odds of persisting with a higher high school GPA were 7% for the second-to-third year, 8% for the third-to-fourth year, and 6% for the fourth-to-fifth year. Students with SAT scores of 1010 or less, or in the bottom third of the study population, that had continuously enrolled through the fourth year were 1.45 times as likely to graduate or persist to the fifth year.

Each of the college experience factors except entering major was significant in at least one persistence transition period. Students working on campus were more likely to return each year. The

odds of persisting ranged from 1.51 to 1.65. Living on campus was more influential in the earlier years. Students living on campus were 1.73 times as likely to return the second year and 1.38 times as likely to continue to the third year.

Being an out-of-state resident was highly significant in the first two years. Out-of-state students were 1.93 times less likely to return the second year and 2.04 times less likely to return the third year. Receiving financial aid was consistently a positive factor but was significant in only one transition period. Those receiving financial aid in the second year were 1.93 times more likely to return for the third year.

Table 3. Year-to-Year Persistence Odds for Aided and Non-Aided Students in Model 1 Receiving Any Financial Aid

Variable	P_{1-2} (n=6.497)		P_{2-3} (n=4,519)		P_{3-4} (n=3,766)		P_{4-5} (n=3,409)	
	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio
Age								
Female	1.15*			1.31**	1.34*			
African American								2.81**
Hispanic						1.51*		1.54*
American Indian		2.17***						
Needy		1.19*		1.46*				
High School GPA	1.08***		1.07***		1.08***		1.06***	
Low SAT							1.45*	
High SAT								
Entering Major								
Live on Campus	1.73***		1.38***					
Work on Campus	1.58***		1.51***		1.65***		1.64***	
Cohort Year								
Independent								
Out-of-State		1.64***		2.04***				
Any Financial Aid			1.93***					

Significant at $p<.05$ *
Significant at $p<.01$ **
Significant at $p<.001$ ***

Model 2 Effects of the Amount of Financial Aid. The second research question explores the relationship between the amount of financial aid received and year-to-year persistence. For this logistic regression model, only students that received financial aid in the year studied are included. For the significant variables in the second model, the odds of aided students persisting over time are presented in Table 4. In the first year, an American Indian student was 2.36 times less likely to re-enroll for the second year. In the third year, the odds of a Hispanic student not persisting to the fourth year were 1.69.

Table 4. Year-to-Year Persistence Odds for Aided Students in Model 2 Amount of Financial Aid

Variable	P_{1-2} (n=3,830)		P_{2-3} (n=2,474)		P_{3-4} (n=2,175)		P_{4-5} (n=1,970)	
	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio
Age								
Female				1.36*	1.50*			
African American								
Hispanic						1.69*		
American Indian		2.36***						
Needy		1.34***		1.61***				
High School GPA	1.08***		1.06***		1.10***		1.07***	
Low SAT							2.10**	
High SAT							1.59*	
Entering Major								
Live on Campus	1.70***							
Work on Campus	1.49***		1.39***		1.71***		1.83***	
Cohort Year		1.22**						1.71**
Independent						2.31*		
Out-of-state		1.86***		2.65***				
Aid Dollars	1.04***		1.06***		1.12***			

Significant at $p<.05$ *
Significant at $p<.01$**
Significant at $p<.001$***

Females receiving aid in the second year were 1.36 times less likely to persist to the third year compared to aided males. Yet, in the next year females were 1.50 times more likely to persist to the fourth year. Needy or low-income students, defined as students entering with Pell grants, were 1.34 times

as likely not to return for the second year compared to all other aided students. The next year, the odds of needy students not persisting increased to 1.61.

For the precollege attributes studied, high school GPA was a significant factor each year. Students with higher high school GPAs were more likely to return by 6% to 10% compared to students with a one-tenth lower high school GPA. SAT scores were significant only in the final transition period. Students with low SAT scores (1010 or less) were 2.10 times more likely to graduate or return for the fifth year. Students with high SAT scores (1130 or more) were 1.59 times as likely to persist to the final year. Among the college experience factors, working on campus was influential in every transition period. Students working on campus were 49% more likely to persist to the second year, 39% more likely to continue to the third year, and 71% more likely to re-enroll for the fourth year, and 83% more likely to graduate or return for the fifth year. Living on campus during the first year increased the odds of persisting to the second year by 70%.

First-year out-of-state students with aid were 1.86 times less likely to return the second year. These negative odds increased to 2.65 for second-year out-of-state students. Being classified as an independent student for third year increased the chances of not persisting to the fourth year by 2.31 times compared to a dependent student. Aided students starting in fall of 1994 were also 22% less likely to persist to the second year compared to aided students starting a year earlier. For the fourth-to-fifth persistence period, fall 1994 students were 1.71 times as likely not to persist.

Finally, amount of aid model found that the dollars of aid had a significant influence during the first three persistence periods. A student with $1,000 additional aid in the first year was 4% more likely to re-enroll during the second year. In the second-to-third year period, an additional $1,000 increased the odds of persisting by 6%. In the next persistence transition, the odds of persisting to the fourth year increased to 12% for $1,000 additional aid in year three. In the final period, the amount of aid was positive but was not significant.

Model 3 Effects of the Amount of Cumulative Debt. The data analyses for the third research question were conducted to study the relationship between the amount of debt and year-to-year persistence. The study population used for testing the Amount of Cumulative Debt Model was restricted to only those students who had any accumulated debt regardless if they had received aid in the year studied.

Therefore, a student who took out a loan in the first year and chose not to borrow the second year nor received any other form of financial aid in the second year was included in the study sample for the second-to-third year persistence debt model.

The amount of debt variable is the amount of total debt accumulated by the student and the student's parents from the federal loan programs and documented by the university. The debt figures include PLUS loans approved by the university. The debt amounts do not include any federal student loans processed at any other institution the student may have attended nor non-student loans such as home equity or credit card loans used to pay educational expenses.

In Table 5, a longitudinal view of the significant factors influencing the persistence of students with debt is provided for Model 3 exploring the effects of the amount of debt. Three demographic variables were significant in the first three years. Compared to males with debt at the end of the second year, females were 1.41 times more likely not to return during the third year. These odds reverse in the third-to-fourth year as females are 1.46 more likely to persist. American Indians with debt in the first year were 2.45 times as likely not to continue to the second year compared to all other students with debt. A Hispanic student in year three was 1.63 times less likely to return for the fourth year. Neither age, being an African American, nor entering as a needy student significantly affected the persistence odds in any year for students with debt.

The precollege attribute of high school GPA influenced the persistence of students with debt in each year studied. A student with a one-tenth higher high school GPA was 9% more likely to return the second year, 6% more likely to re-enroll in the third year, and 7% more likely to re-enroll in the fourth and fifth years. The second precollege attribute of SAT scores only influenced persistence in the final year. Those students with low SAT scores were 1.62 times more likely to graduate or persist to the final year.

The college experience variables of living and working on campus had influence in the first three transition periods. Students living on campus the first year were 52% more likely to return the second year. Working on campus increased a student's odds of persisting to the second year by 60% and 90% for return to the fourth year. Being independent for financial aid purposes in the first year increased the odds of persisting to the second year by 88%. Out-of-state students, however, were 1.94 times as likely not to return for the second year and 2.16 times as likely not to persist to the third year.

The level of debt was a significant factor influencing persistence in the first three transition periods. A student with an additional $1,000 of debt was 8% more likely to return for the second year. The effect of an additional $1,000 of debt dropped to 2% increased odds of persisting to year three and 3% for returning for the fourth year. The amount of debt in the fourth year was a positive influence on graduating or re-enrolling for the fifth year but was above the .05 significance level (p=.0805).

Table 5. Year-to-Year Persistence Odds for Students with Debt in Model 3

Amount of Cumulative Debt

Variable	P_{1-2} (n=2,038)		P_{2-3} (n=1,663)		P_{3-4} (n=1,673)		P_{4-5} (n=1,671)	
	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse-Odds-Ratio
Age								
Female				1.32*	1.46*			
African American								
Hispanic						1.63*		
American Indian		2.45**						
Needy								
High School GPA	1.09***		1.06***		1.07**		1.07**	
Low SAT							1.62*	
High SAT								
Entering Major								
Live on Campus	1.52***							
Work on Campus	1.60***				1.90**			
Cohort Year								1.53*
Independent	1.88*							
Out-of-state		1.94***		2.16***				
Debt Dollars	1.08***		1.02*		1.03*			

Significant at p<.05 *
Significant at p<.01**
Significant at p<.001***

Model 4 Effects of the Type of Cumulative Debt. The fourth research question examines the relationship between the type of debt and year-to-year persistence of students with debt. As with the third model for level of debt, the study population was restricted to only those students who had any

accumulated debt. Receipt of financial aid in the year studied was not a requirement. The persistence odds presented in Table 6 for the type of debt are nearly identical to those previously discussed for the amount of debt model in Table 5. The odds of persisting year-to-year should be similar since both models used the same study population, students with debt, and the only difference was if the debt variable was measuring dollars of debt or type of debt. Having unsubsidized debt was not significant in any year although it was negative for each year.

Table 6. Year-to-Year Persistence Odds for Students with Debt in Model 4 Type of Cumulative Debt

Variable	P_{1-2} (n=2,038)		P_{2-3} (n=1,653)		P_{3-4} (n=1,573)		P_{4-5} (n=1,571)	
	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio	Odds-Ratio	Inverse Odds-Ratio
Age								
Female				1.32*	1.49*			
African American								
Hispanic						1.67*		
American Indian		2.53**						
Needy								
High School GPA	1.09***		1.05***		1.06**		1.06**	
Low SAT							1.61*	
High SAT								
Entering Major								
Live on Campus	1.66***							
Work on Campus	1.59***				1.93**			
Cohort Year								
Independent	1.97*							
Out-of-state		1.60***		1.87***				
Unsubsidized Debt								

Significant at $p<.05$ *
Significant at $p<.01$**
Significant at $p<.001$***

Summary of Findings and Conclusions

At the end of five years, 55.2% of the study cohort had graduated or were still enrolled. The initial examination of persistence using descriptive and inferential statistics to explore the association of individual factors with overall persistence revealed that the following variables were significant: age, gender, ethnicity, need, high school GPA, first year enrollment hours, working on campus the first year, and first year college GPA. A majority of the enrolled study population received financial aid, ranging from a high of 59.1% in the first year to a low of 54.0% in the second year.

Using logistic regression modeling, the effects of the demographic variables (age, gender, ethnicity and need), precollege attributes (high school GPA and SAT scores), college experience factors (major, living on campus, and working on campus), and the control factors (year of entry, dependency status, and residency status) were measured each enrollment year. After identifying the effects of these factors, the role of financial aid was explored.

Model 1 Receipt of Any Financial Aid

In the first model comparing aided students to non-aided students, the receipt of aid was positively associated with persistence in all four transition periods. The positive effect of financial aid on persistence was significant in the second-to-third year transition. Students receiving aid during the second year were 93% more likely to return during the third year. These aid findings are consistent with many studies reporting positive influences of aid on persistence (e.g., St. John, et.al.,1991; Terkla, 1985). Yet, these findings are in direct contrast to other studies such as Somer's 1995 research reporting significant negative relationships between receiving aid and persisting to the second year and Perna's 1998 finding of no significant relationship between receipt of aid and five-year outcomes using path analyses.

Among the demographic variables (age, gender, ethnicity, and low-income or need status), only age was not a significant factor in any year. The analyses by ethnicity reveal that the dropout or stopout points vary. American Indians are more likely to leave after the first year, Hispanic students are more likely to leave after the third and fourth years, and African Americans are more likely to leave after the fourth year. These findings reflect the differences among the three traditionally underrepresented minorities that are often studied as a collective group by necessity due to their smaller numbers.

The persistence patterns by gender also varied during the first three periods. Males were more likely to leave after the first and third years while females were much likely to leave after the second year. Needy or low-income students were much more likely to leave after both the first two years.

Of the two precollege attribute variables, high school GPA had a stronger relationship with persistence than SAT scores. High school GPA was significant in each transition period. A student with a GPA one-tenth of a point higher was 8% more likely to re-enroll during the second year, 7% more likely in the second-to-third year, 8% for the third-to-fourth year, and 6% for the fourth-to-fifth year. SAT scores were only significantly associated with persistence from the fourth-to- fifth year. Both Tekla's 1985 work and Stampen and Cabrera's 1986 research also found high school GPA to be one of the strongest predictors of persistence or attrition.

Each of the college experience factors except entering major was significant in at least one persistence transition period. Students working on campus were more likely to return each year. The odds of persisting ranged from 1.51 to 1.65. Living on campus was more influential in the earlier years. Students living on campus were 1.73 times as likely to return the second year and 1.38 times as likely to continue to the third year.

Having out-of-state residency was negatively associated with persistence in the first two transition periods. Out-of-state students were twice as likely not to return the second and third years compared to in-state residents.

Model 2 Amount of Financial Aid

In the second model with only aided students, the amount of aid model found that the dollars of aid had a significant influence during the first three persistence periods. A student with $1,000 additional aid in the first year was 4% more likely to re-enroll during the second year. In the second-to-third year period, an additional $1,000 increased the odds of persisting by 6%. In the next persistence transition, the odds of persisting to the fourth year increased to 12% for $1,000 additional aid in year three. In the final period, the amount of aid was positive but was not significant.

The findings support the hypothesis with the exception of the final year. Similar findings are found in the Murdock, et. al. (1995) study that reports the amount of aid received in the second and third years was a significant determinant in returning in the third and fourth years. Another institutional study

conducted by Somers (1995) of first year within-year persistence comparing aided students to non-aided students found that for each $1,000 of aid, 1989 first-time students with aid were 5% more likely to persist than non-aided students. These research studies validate the percentage increase in odds and increased impact after the first year found in the present study.

Several other studies have found that financial aid has a stronger effect in the latter years of college (e.g., Murdock's 1987 meta-analysis). Murdock, Nix-Mayer and Tsui's 1995 study also concluded that as students approach graduation the amount of aid becomes more important than the type or distribution of aid. M. Fenske's 1993 study also found the amount of aid, not type of aid, was positively linked with long-term persistence. Therefore, the results of the influence of the amount of aid in this research comparing only aided students in the post-1992 reauthorization period are similar to earlier results.

The pattern of significance and direction of the influence of the non-aid variables for only aided students were similar to those found for the entire cohort in Model 1. One exception is noted. The only cohort effect observed in the entire study (four transition periods for each of four models) occurred in the first and fourth years among aided students in Model 2 and in the fourth year among students with debt in Model 3. Aided students entering in fall 1994 were more likely not to re-enroll during the second and fifth years compared to aided students entering a year earlier. Since no major change in institutional financial aid policy was identified, this result is most likely a by-product of normal fluctuations in student cohorts. The stability of the results in student research is often less than perfect.

Of all the non-aid findings in Model 2, the most disturbing is that related to the significant drop in needy student persistence during the early years. Somer's 1995 study also found that when the amount of aid replaced the any aid variable in a first year within-year persistence model, low-income students' odds of persisting dropped. She concludes that this "may relect the gap or unmet financial need of low-income aid applicants" (p.21).

Model 3 Amount of Debt

In Model 3, the relationship between the amount of debt and persistence is explored for those students with any debt. The level of debt was a significant factor influencing persistence in the first three transition periods, but in the opposite direction as expected. A student with an additional $1,000 of debt was 8% more likely to return for the second year. The effect of an additional $1,000 of debt dropped to

2% increased odds of persisting to year three and 3% for returning for year four. The amount of debt in the fourth year was a positive influence on graduating or re-enrolling for the fifth year but was above the .05 significance level (p=.08). Therefore, the findings do not support the hypothesis that debt is negatively associated with persistence in the first three years.

The results of this research do not follow the recent debt findings that generally report that loans promote within-year persistence but negatively effect year-to-year and long-term persistence (e.g., General Accounting Office, 1995; Fenske, Dillon, & Porter, 1997; Cofer & Somers, 1997, 1998, 1999). These studies, however, either compared students with debt to students with no debt or studied a particular segment of students such as low-income or Pell recipients. This study's findings, however, may be linked to St. John's 1989 findings that loans became consistently and positively associated with year-to-year persistence for students in the 1980s, a reversal from his results of students in the 1970s. The findings of the present research indicate that for the students taking out loans after the post-1992 reauthorization and in this particular institutional setting, the amount of accumulated debt did not negatively effect persistence.

The significant non-aid factors for students with debt closely followed the patterns and odds of persisting for aided students in Model 2. A few differences are highlighted. Unlike Model 2, needy or low-income students with debt did not have significantly different persistence patterns from all other students with debt. The other key difference was that working on campus which significantly increased the odds of persisting each year for aided students was only significant for students with debt in two transition periods. For students who take on debt, social integration may have less influence on their decision to continue or they may have less need to work.

Model 4 Type of Debt

As with Model 3, Model 4 only examines those students with debt. Having any unsubsidized debt was negatively associated with persistence in each transition periods as hypothesized, but not at a significant level.

The concern over the expansion of unsubsidized debt opportunities in the 1992 reauthorization has not yet generated any debt studies separating unsubsidized debt from subsidized debt that could be located. This is probably due to the difficulty in obtaining data that identifies the type of debt as well as the

relatively new concern over this issue. These research findings concerning the type of debt may alleviate some of the concerns that students would borrow freely and unwisely from the unsubsidized loan programs with a detrimental effect on persistence. At least for these first two freshmen classes after the 1992 reauthorization, students with any unsubsidized debt persisted at rates comparable to students with only subsidized debt. Since the subsample of students, only those with debt, was identical to that of Model 3, the comparison of patterns of significant non-aid factors by year and the odds are almost identical to those found and previously discussed for Model 3.

Assessment of the Methodology

The strength of the Persistence Model as a conceptual framework is that it includes the financial aid factors which allows researchers to examine the relationships between aid and persistence. Although the addition of the financial aid variable did not strengthen each model for every year, in general the aid variables added to the ability to predict year-to-year persistence and compare longitudinally the varying influences. The only exception was for Model 4 that found no significant difference in persistence patterns by type of debt in any year.

It also proved the applicability of logistic regression to predict dichotomous outcomes such as persistence especially in the first years when the distribution of outcomes is not extreme in either case. Yet, logistic regression is less effective when the distribution of the outcomes is heavily weighted towards one of the two outcomes, e.g., the later persistence periods when more than 9 out of ten students return.

Another limitation of logistic regression is the inability to measure indirect effects of one variable on another. Studies using structural modeling have been able to measure the indirect effects financial aid has on the other key determinants of persistence including college grades and enrollment hours. Yet structural modeling for numerous years for different models is extremely complex.

Another drawback of using logistic regression and measuring only direct effects is that in student research, the most widely used predictor variables are often highly correlated and may be multicollinear. The final observation concerning the study's logistic regression models is that the predictive power of the persistence outcomes was rather low especially for non-persisters.

On a final note, this research reinforces that who is studied and the comparison group is very important when comparing results across studies. Comparing the persistence of students with debt by

amount of debt yields different results than comparing the amount of debt received by students to students without any debt. The more significant differences found when comparing to students without debt is due to the greater variation in the population.

Recommendations for Future Research

Analysis of year-to-year persistence by type of financial aid received would complement and expand on the research conducted for this study. The effects of grant, scholarship, loan and work-study dollars may provide greater insight in interpreting the results of this study including the higher attrition rates of needy students in the early years.

Using the same models and data, but for separate subpopulations is recommended. In particular, a comparison of two subpopulations such needy and non-needy students' significant factors including aid variables on persistence could aid administrators and policy makers in the design or refinement of programs geared to improve the persistence of needy students. This additional research is needed to delve into the possible other factors of the significantly poor persistence rates of needy students found in this study. Supplemental analysis is also needed to determine if these needy students not enrolling in the subsequent year were stopouts who returned later or dropouts.

For future studies of later cohorts at the same institution, it would be valuable to add the recently developed academic integration data to examine if participation in key programs such as the Freshmen Year Experience (FYE) and specially targeted programs such as the American Indian retention program improve persistence. Program participation could be used as a factor in persistence outcomes or possibly as a factor influencing college GPA.

Experimentation with other statistical methodologies is also recommended. Structural modeling would assist in identifying how financial aid impacts other key variables of persistence and would be particularly desirable if examining persistence from entry to one point in time such as five or six years later. For a more in-depth longitudinal study, event history analysis may capture the cumulative effects of aid by including time-variant factors. For instance, having a grant in the first year and no loans affects more than second year persistence—it may affect all future year financial aid decisions and, hence, all future years' persistence. Although this research did attempt to capture some of the cumulative effects of

loans, or total debt, event history analysis would accomplish this for all variables. Also the problem of very uneven outcome distributions may be avoided.

Conclusions

This research has provided a comprehensive examination of the determinants of year-to-year persistence at a public, research university after the 1992 reauthorization of the Higher Education Act. The findings emphasize that the relationships of both aid and non-aid variables to persistence change as students progress through college to graduation.

In summary, persistence in higher education through the final goal of educational attainment remains to be a complex issue. The post-1992 reauthorization federal aid programs combined with the institutional aid policies did not negatively influence persistence of those students receiving aid in this study. Increasing amounts of aid significantly promoted the odds of persisting. For the students who chose to finance their education with loans, the amount of debt assumed increased their odds of successfully persisting through higher education while the type of debt had no significant impact.

References

Cabrera, A. F., Stampen, J. O., & Hansen, W. L. (1990). Exploring the effects of ability to pay on persistence in college. *Review of Higher Education 13* (3, Spring), pp. 303-336.

Chronicle of Higher Education. (1999). *Almanac 1999-2000.* Washington DC: Author.

Cofer, J. (1998). Decade of indecision: The impact of federal policy on student persistence, 1987-1996. (Doctoral dissertation, Little Rock, AR: University of Arkansas at Little Rock).

Cofer, J., & Somers, P. A. (1997, October). Mortgaging their future: Debtload and undergraduate persistence. Paper presented at the annual meeting of the Association for the Study of Higher Education, Albuquerque, NM.

Cofer, J., & Somers, P. A. (1998, April). Debtload and undergraduate persistence: A comparison of public and private college students. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Cofer, J., & Somers, P. A. (1999, June). Deeper in debt: The impact of the 1992 reauthorization on student persistence. Paper presented at the 39th annual forum of the Association for Institutional Research, Seattle, WA.

DeLoughry, T. J. (1992). The Higher Education Amendments of 1992: What they mean for colleges and students. *The Chronicle of Higher Education*, 5/August, p. A20.

DesJardins, S. L. (1999). A comment on interpreting odds-ratios when logistic regression coefficients are negative. Manuscript submitted for publication, University of Iowa, Iowa City, IA.

Fenske, M. A. (1993). The relationship of loans and grants to undergraduate persistence and degree completion. (Doctoral dissertation, Tempe, AZ, Arizona State University).

Fenske, R. H., & Gregory, B. D. (1994). The dream denied? Evaluating the impact of student financial aid on low-income/minority students. In S. Hood & H. T. Frierson (Eds.) *Advances in Program Evaluation, Volume 2* (pp. 141-160). Greenwich, CT: JAI Press.

Fenske, R. H., Porter, J. D., & Dillon, K. A. (1997). Studying the impact of federal changes at the campus level. In R. Voorhees (Ed.) *Financial Aid Issues, New Directions in Institutional Research Sourcebook*, no. 95 (Fall), (pp. 83-97). San Francisco, CA: Jossey-Bass.

General Accounting Office. (1995). *Higher Education: Restructuring Student Aid Could Reduce Low-Income Student Dropout Rate. Report to Congressional Requesters*. Washington, DC: Author.

McPherson, M. S., & Schapiro, M. O. (1998). *The Student Aid Game: Meeting Need and Rewarding Talent in American Higher Education*. Princeton, NJ: Princeton University Press.

Murdock, T. A. (1987). It isn't just money: The effects of financial aid on student persistence. *Review of Higher Education 11*, pp. 75-101.

Murdock, T. A., Nix-Mayer, L. & Tsui, P. (1995, May). The effect of types of financial aid on student persistence towards graduation. Paper presented at the 35th annual forum of the Association for Institutional Research, Boston, MA.

National Center for Education Statistics. U. S. Department of Education. (1998). *Student Financing of Undergraduate Education: 1995-96, With an Essay on Student Loans,* NCES 98-076, by L. Berkner. A. G. Malizio, project officer. Washington, DC: U. S. Department of Education.

Perna, L. W. (1998). The contribution of financial aid to undergraduate persistence. *Journal of Student Financial Aid 28* (3), pp. 25-40.

Somers, P. A. (1992). A dynamic analysis of student matriculation decisions in an urban public university. (Doctoral dissertation, New Orleans, LA, University of New Orleans.)

Somers, P. A. (1995). A comprehensive model for examining the impact of financial aid on enrollment and persistence. *Journal of Student Financial Aid 25* (1, Winter), pp. 13-27.

Somers, P. A., & St. John, E. P. (1997). Analyzing the role of financial aid in student persistence. In J. S. Davis (Ed.) *Student Aid Research. A Manual for Financial Aid Administrators* (pp. 127-138). Washington, DC: National Association of Student Financial Aid Administrators.

St. John, E. P. (1989). The influence of student aid on persistence. *Journal of Student Financial Aid 3* (2, Fall), pp. 52-68.

St. John, E. P. (1992b). Workable models for institutional research on the impact of student financial aid. *Journal of Student Financial Aid 22* (3), pp.13-26.

St. John, E. P., Kirshstein, R. J., & Noell, J. (1991). The effects of student financial aid on persistence: A sequential analysis. *Review of Higher Education 14*, pp. 383-406.

St. John, E. P., & Noell, J. (1989). The effects of student financial aid on access to higher education: An analysis of progress with special consideration of minority enrollment. *Research in Higher Education 30* (6), pp. 563-581.

Stampen, J. O., & Cabrera, A. F. (1986). Exploring the effects of student aid on attrition. *Journal of Student Financial Aid 16* (2), pp. 28-40.

Terkla, D. G. (1985). Does financial aid enhance undergraduate persistence? *Journal of Student Financial Aid 15* (3, Fall), pp. 11-18.

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