



Retention and Graduation: An Examination of Students Who Earn Academic Probation

Paper Presented at the 2006 SAIR Forum

Arlington, VA

Charles Mathies

Denise Gardner

Karen Webber Bauer

Office of Institutional Research

The University of Georgia

ABSTRACT

A regular analysis conducted by many institutional research offices relates to student retention and persistence. Despite voluminous research, no definitive model has been developed to provide guidelines for institutional officials to enhance student persistence through graduation. This study examines the academic progression of a cohort of entering freshmen at a large southeastern Research I university who have been placed on academic probation at some point during their tenure at the institution. Findings include significant differences in graduation and retention between students who earn probation and students who do not earn probation. Students who earn probation are significantly less likely to be retained and graduate than students who do not earn probation. Being male, an in-state resident, not joining a Greek organization, and receiving need-based financial aid increase the likelihood a student earns probation.

## Introduction

Regular analyses conducted by many institutional researchers include student retention and persistence studies. By definition, retention refers to the ability on an institution to retain a student from admission to the institution through graduation, most often related to a single institution (as opposed to a student's transfer between two or more colleges; Berger & Lyon, 2005). Persistence is the conscious act by students to maintain their status in education and continue their enrollment in a higher education institution (Mortenson, 2005).

Historically, concerns about student retention and persistence have largely been focused at the institutional level. However, in the last few years, policy makers have become more interested in student retention and persistence not only at the institutional level, but also at the state and federal level (Titus, 2006). Much of the increased governmental attention on retention and persistence is due, in large part, over accountability and efficiency concerns of higher education. Greater governmental oversight coupled with internal pressures to manage enrollments is providing institutions incentives to look for new ways to understand their students and their progression through the institution.

Research on student persistence and retention is voluminous and despite all the research, no definitive model has been developed to provide guidelines for institutional officials to enhance student persistence through graduation (Seidman, 2005). Past research has provided differing theories as to why some students leave and why some persist, but the most influential reasons include students' level of academic preparation,

commitment to their studies, and the intensity of their involvement within the institution (Seidman, 2005).

While these studies have examined and provided evidence for explaining student retention and persistence, one area that has not been examined in depth is the relationship between academic probation and student persistence and graduation. By definition, students who do not achieve an institutionally-set minimum grade point average are placed on academic warning or probation. Being placed on probation is usually the first step before a student is academically dismissed from a program or institution.

This study examines the academic progression of students who have been placed on academic probation at some point during their tenure at a public research institution. This study hopes to help institutions understand probation students and provide clues where institutional intervention can help students persist and be retained on through graduation. Research questions guiding this study include:

- 1) Who are the students who earn academic probation and how do they compare to students who have not been placed on academic probation?
- 2) Do particular institutional mechanisms promoting retention and graduation work effectively in reducing student probation? (I.E., are students who enroll in freshman seminars or live on campus as freshman less likely to be placed on academic probation?)
- 3) Is there a difference in the year-to-year retention and baccalaureate graduation rates of probation and non-probation students?
- 4) Can a predictive model be developed to examine contributing factors that contribute to students being placed on academic probation?

### Sample

Mortenson (2005) suggests that the foundation of measurement for student persistence studies is through the use of cohorts (a clearly defined group), identification of demographic and enrollment characteristics, and tracking of these characteristics over time. The data set for this study is a cohort of 4,375 students who enrolled as first-time freshman in the fall 1999 semester. Student demographic and financial characteristics are paired with student academic and social activity for each semester through the fall 2006 semester (a total of 19 semesters, including summers).

The institution in this study is a large, research-extensive public university located in the Southeast. As the state's flagship and land-grant university, it offers over 150 degree programs in 15 schools and colleges. The undergraduate student body is comprised mainly of traditional age students (18-22 yrs) enrolling primarily from the local region (~85% of students are in-state). Approximately 25,000 undergraduates are currently enrolled at the institution.

### Model

Some notable examples of student retention and persistence studies have shown that student background characteristics (Tinto, 1975; Pascarella & Terenzini, 1980; Tinto, 1997; St. John, Hu, Simmons, & Musoba, 2001; Paulsen & St. John, 2002; Perkhounkova, Noble, & McLaughlin, 2006; Titus, 2006) student ability (St. John, Hu, Simmons, & Musoba, 2001; Perkhounkova, Noble, & McLaughlin, 2006; Titus, 2006) student social integration/involvement (Pascarella & Terenzini, 1980; Tinto, 1997; Titus, 2006) student academic integration (Pascarella & Terenzini, 1980; Tinto, 1997) and student wealth/socioeconomic status (St. John, Hu, Simmons, & Musoba, 2001; Paulsen

& St. John, 2002; Perkhounkova, Noble, & McLaughlin, 2006; Titus, 2006) as factors influencing persistence and retention. The five groupings of variables included in this study are:

- Admission Profile:
  - SAT score
  - High School GPA
  - Predicted GPA (derived from SAT and HS GPA)
- Student Demographics
  - Gender
  - Race/Ethnicity
  - In-State/Out-of-State residency status
- Academic Involvement:
  - Enrolled in UNIV course in 1<sup>st</sup> fall semester<sup>1</sup>
  - Enrolled in freshman seminar in 1<sup>st</sup> fall semester<sup>2</sup>
- Collegiate & Social Involvement:
  - Lived in Residence Halls in 1<sup>st</sup> fall semester
  - Joined a Greek organization in 1<sup>st</sup> fall semester

---

<sup>1</sup> UNIV courses are introductory courses in English, mathematics, reading, and study strategies. Some of these courses have a non-traditional format and carry only institutional credit, not counting towards graduation.

<sup>2</sup> Freshman seminars provide an opportunity for students new to the University to become acquainted with a senior faculty member and to learn something about the excitement of study and research in a specific discipline and the intellectual challenge of academic life at the University. Class size is limited to encourage one-on-one interaction, and some seminars are hosted in residence halls. Seminars are focused on topics of special interest to faculty members' research and teaching and explore a diverse array of topics. The majority of First-year seminars count as one hour of credit towards graduation.

- Financial Aid:
  - Receipt of merit-based scholarship in 1<sup>st</sup> fall semester
  - Receipt of non-need based aid in 1<sup>st</sup> fall semester (minus merit-based aid)
  - Receipt of need-based aid in 1<sup>st</sup> fall semester (all types, including Pell)
  - Receipt of Pell Grants (only) in 1<sup>st</sup> fall semester

University-wide regulations provide that undergraduates are placed on academic probation at the end of any term in which their cumulative grade point average is below 2.00. Students may remove themselves from academic probation by achieving a 2.00 cumulative grade point average. Transfer credits are not included in the computation of the cumulative grade point average. Students are academically dismissed after two successive terms of probation if their cumulative grade point average remains below that required for a designated number of total hours attempted<sup>3</sup>. While some colleges maintain academic standards that exceed university regulations, only the university-wide regulations for probation are used for this study.

Students who earned probation were classified into three groups: students who earned probation after the 1<sup>st</sup> fall semester, students who earned probation after the 1<sup>st</sup> spring semester, and students who earned probation at any time during their time at this institution (probation ever). These groups are inclusive and students can be placed in more than one group (example: a student who earns probation after the first fall semester and first spring semester is in all three probation groups; a student who earns probation only after the first fall semester is in the probation after the 1<sup>st</sup> fall and probation ever groups).

---

<sup>3</sup> The required minimum cumulative GPA rises sequentially based on the number of total hours attempted. In other words, the more hours a student has, the higher the minimum cumulative GPA is required.

A variety of analyses were conducted to examine the research questions above. A series of descriptive statistics and one-way ANOVAs were followed by a binary logistic regression analysis to examine potentially contributing factors of students earning probation after the first fall semester. Basic descriptive statistics and correlation analyses provide an understanding of students who earn academic probation and the general relationship among probation status and retention and graduation rates of the sample. A binary logistic regression was developed to determine the effect each independent variable has on students earning probation (ever), the dependent variable.

### Findings

A total of 672 students (15% of the cohort) earned probation at some point during their time at the university (probation ever). 400 students (9%) earned probation after their 1<sup>st</sup> fall semester and 360 students (8%) earned probation after the 1<sup>st</sup> spring. Table 1 shows the admissions profile of the cohort and the probation group. As shown, students who earn probation (for all three probation groups) have lower high school GPA, SAT scores, and predicted GPA than students who never earn probation ( $p < .01$  for all three variables; HS GPA, SAT, and Predicted GPA).

Table 1: Admissions Profile of Students

	Cohort	On probation after 1 <sup>st</sup> fall	On probation after 1 <sup>st</sup> spring	On probation ever	Never on probation
HS GPA (Mean)	3.50	3.20	3.18	3.22	3.55
SAT (Mean)	1189	1158	1152	1153	1195
Predicted GPA (Mean)	3.09	2.82	2.79	2.83	3.13

The majority of the cohort was female (58%), but over 60% of the students who earned probation were male (similar results for all three probation groups,  $p < .01$ ). 10% of all female students and 23% of all male students earned probation (ever) during their time at the university ( $p < .01$ ).



The students in the cohort were predominately white (84%), but white students were less represented in the three probation groups than in the cohort. Asian, Black/African-American, and multi-racial students were over represented in each of the three probation groups than in the cohort ( $p < .01$ ). White and Hispanic students (12-14%) were less likely to have earned probation (ever) than the other race/ethnic groups (23-43%) ( $p < .01$ ).

Table 2 shows the enrollment rates in UNIV and freshman seminar courses of the entire cohort and probation groups. Students who ever earned probation (ever) had higher rates of taking a UNIV course in their first year (for both the fall 1999 and spring 2000 semesters) compared to non-probation students ( $p < .01$ ). Students who earned probation (ever) had lower rates of enrollments in a freshman seminar course than non-probation students ( $p < .01$ ).

Table 2: Freshman Seminar & UNIV Course Enrollment Rates

	Cohort	On probation ever	Never on probation
Took a UNIV course in 1 <sup>st</sup> Fall	.065	.099	.058
Took a UNIV course in 1 <sup>st</sup> Spring	.083	.128	.075
Took a Freshman Seminar in 1 <sup>st</sup> Fall	.175	.143	.181

Table 3 shows the rates of students receiving different types of financial aid. For the first year (Fall 1999-Spring 2000), probation (ever) students had comparable rates of receiving merit-based scholarship as compared to non-probation students ( $p < .01$ ). In the second year (Fall 2000-Spring 2001), probation students were drastically less likely to receive merit-aid scholarships compared to non-probation students ( $p < .01$ ). Students on probation (ever) had higher rates of receiving need-based aid (all types, including Pell Grants) than non-probation students ( $p < .01$ ). Probation (ever) students had roughly double the rates of receiving Pell Grants than non-probation students ( $p < .01$ ).

Table 3: Rates of Receiving Financial Aid

	Cohort	On probation ever	Never on probation
Student had Merit-Aid in 1 <sup>st</sup> Fall	.976	.957	.979
Student had Merit-Aid in 1 <sup>st</sup> Spring	.947	.899	.956
Student had Merit-Aid in 2 <sup>nd</sup> Fall	.751	.412	.816
Student had Merit-Aid in 2 <sup>nd</sup> Spring	.547	.033	.646
Student had Need-Based Aid in 1 <sup>st</sup> Fall	.200	.309	.180
Student had Need-Based Aid in 1 <sup>st</sup> Spring	.185	.281	.168
Student had Pell Grant in 1st Fall	.122	.198	.108
Student had Pell Grant in 1 <sup>st</sup> Spring	.115	.179	.104

Table 4 shows the proportion of need-based (all types, including Pell Grants) and Pell Grant recipients who earned probation. Nearly one-fourth of all need based and Pell Grant recipients earned probation sometime during their undergraduate career.

Table 4: Proportion of Probation Students in Need-based Aid and Pell Grants

	On probation ever	Never on probation
Student had Need Based Aid in 9908	.237	.763
Student had Need Based Aid in 0002	.233	.767
Student had Pell Grant in 9908	.249	.751
Student had Pell Grant in 0002	.238	.762

Table 5 shows the stop-out and drop-out rates of the cohort and the probation groups. Each of the three probation groups had significantly higher rates of students stopping-out and/or dropping out than the non-probation group ( $p < .01$ ).

Table 5: Stop-out & Drop-out Rates:

	Cohort	On probation after 1 <sup>st</sup> fall	On probation after 1st spring	On probation ever	Never on probation
Stop Out - Anytime before end of 3 <sup>rd</sup> year	.096	.255	.331	.283	.059
Drop Out - Anytime before graduation	.223	.630	.678	.601	.155

Table 6 shows the composition of the stop-out and drop-out groups. For the first three semesters (non-summer), there were proportionately more probation (all three groups)

students who stopped-out and dropped-out than in the following two semesters (non-summer). In most of the first three semesters (non-summer), over 30% of the stop-outs & drop-outs were students who had earned probation after their first fall semester ( $p < .01$ ). After the third semester (2<sup>nd</sup> fall semester), the proportion of students who earned probation after the first fall semester in the stop-out and drop-out groups significantly dropped to less than 20% ( $p < .01$ ).

Table 6: Proportion of Probation Students in Stop-out & Drop-out Groups:

	On probation after 1 <sup>st</sup> fall	On probation after 1st spring	On probation ever	Never on probation
Stop Out - After 1st Fall	.191	.095	.405	.595
Stop Out - After 1st Spring	.323	.427	.470	.529
Stop Out - After 2nd Fall Semester	.379	.432	.579	.421
Stop Out - After 2nd Spring Semester	.136	.198	.383	.617
Stop Out - After 3rd Fall Semester	.108	.096	.386	.615
Stop Out - Anytime before end of 3rd year	.244	.285	.455	.526
Drop Out - After 1st Fall	.316	.000	.316	.684
Drop Out - After 1st Spring	.346	.387	.419	.581
Drop Out - After 2nd Fall Semester	.452	.484	.559	.441
Drop Out - After 2nd Spring Semester	.085	.099	.206	.858
Drop Out - After 3rd Fall Semester	.200	.178	.511	.489
Drop Out - Anytime before graduation	.258	.249	.414	.587

Table 7 shows the graduation and retention rates of the cohort and probation groups. A retained student refers to students who have enrolled in the subsequent (non-summer) semester and/or graduated. In general, students who have earned probation (similar results for all three probation groups) were much less likely to graduate and be retained than students who did not earn probation. Only 62% of the students who earned probation after their first fall semester were retained after the first year ( $p < .01$ ). 51% of students who earned probation (ever) were retained after the 3<sup>rd</sup> year compared to 86% of students who never earned probation ( $p < .01$ ). Only 31% of the students who had earned

probation (ever) graduated within 6 years or less compared to 83% of students who never earned probation ( $p < .01$ ).

Table 7: Retention & Graduation Rates

	Cohort	On probation after 1 <sup>st</sup> fall	On probation after 1st spring	On probation ever	Never on probation
Retained after 1st Year	.892	.615	.622	.719	.924
Retained after 2nd Year	.827	.435	.397	.548	.877
Retained after 3rd Year	.805	.435	.408	.511	.859
Graduated in 4 years or less	.431	.073	.019	.052	.499
Graduated in 5 years or less	.691	.240	.178	.220	.776
Graduated in 6 years or less	.745	.310	.242	.308	.825

Table 8 shows the composition of the students not retained during the first three years. In each of the first three years, roughly 40% of the non-retained students earned probation (ever) during their undergraduate career ( $p < .01$ ).

Table 8: Proportion of Probation Students in Non-Retained Groups

	On probation after 1 <sup>st</sup> fall	On probation after 1st spring	On probation ever	Never on probation
Not Retained after 1 Year	.326	.288	.400	.599
Not Retained after 2 Years	.298	.286	.400	.599
Not Retained after 3 Years	.265	.249	.386	.614

### Binary Logistic Regression

In order to more fully examine the relationship between students and contributing factors leading to probation, a binary logistic regression was developed. For the binary logistic regression analysis, only probation ever is used. Binary logistic regression was chosen due to the dependent variable being binary (Yes, student earned probation ever; No, student did not earn probation ever) and is a model which can appropriately handle

binary dependent variables. The following independent variables were used in the binary logistic regression<sup>4</sup>.

- Predicted GPA (derived from SAT and HS GPA)
- Gender
- In-State/Out-State residency status
- Enrolled in UNIV course in 1<sup>st</sup> fall semester
- Joined a Greek organization in 1<sup>st</sup> fall semester
- Receipt of need-based aid in 1<sup>st</sup> fall semester (all types, includes Pell Grants)

In the correlation table between the independent variables, no strong relationships between variables were revealed. In the classification table marking correct and incorrect estimates for the null model (with only the constant present in the model), it predicts students not earning probation (the most frequent category of dependent variable) at 84.6%. While this overall percent correctly predicted from the null model is acceptable, it must be noted however that just blindly estimating for the most frequently category (non-probation status) for all cases yields the same percent correct (84.6%).

The Cox-Snell  $R^2$  and Nagelkerke  $R^2$  are attempts to provide a logistic analogy to  $R^2$  in OLS regression. The Nagelkerke measure adapts the Cox-Snell measure so that it varies from 0 to 1, as does  $R^2$  in OLS.

step	-2 Log Likelihood	Cox-Snell $R^2$	Nagelkerke $R^2$
1	3086.989	0.133	0.230

<sup>4</sup> A number of variables were originally included in the full model but were removed from the final model after showing statistically insignificant. Some specific variables removed include race/ethnicity, enrollment in a freshman seminar, living on campus, receipt of merit-based financial aid, receipt of non-need financial aid, and receipt of Pell Grants.

The Hosmer and Lemeshow Goodness-of-Fit Test divides subjects into deciles based on predicted probabilities, and then computes a chi-square from observed and expected frequencies (Hosmer & Lemeshow, 2000). The p-value = .406 here indicates that the logistic model is a good fit (If the Hosmer and Lemeshow Goodness-of-Fit Test is .05 or less, we would reject the null hypothesis that there is no difference between the observed and predicted values of the dependent variable – student earned probation ever). As the p-value is greater than .05, we fail to reject the null hypothesis that there is no difference, implying that model's estimates fit the data at acceptable levels.

Table 9 below is a 2x2 classification table marking correct and incorrect estimates for the full the model with the independents as well as the constant. While the overall percent correctly predicted is good at 85.4%, it must be noted that this percentage is only slightly higher than the percent correctly predicted (84.6%) by blindly estimating the most frequent case for all cases. This implies that probation status can be differentiated on the basis of a student's predicted GPA, gender, in-state/out-state residency status, enrollment in a UNIV course, joining a Greek organization, and receiving need-based financial aid for these data.

Table 9: Classification Table

Observed			Predicted		
			Student on Probation after 1st Semester		Percentage Correct
			Not on probation after 1st semester	On probation after 1st semester	
Step 1	Student on Probation after 1st Semester	Not on probation after 1st semester	3573	63	98.3
		On probation after 1st semester	563	101	15.2
	Overall Percentage				85.4

a The cut value is .500

Table 10 shows the variables in the equation and gets to the heart of the results of the model. It shows the coefficients (B), their standard errors, the Wald-Chi-Square statistic, associated p-values, and odds ratio (Exp (B)). The Wald statistic and the corresponding significance level test the significance of each of the covariates in the model (Savin & Würtz, 2001). The ratio of the logistic coefficient B to its standard error, squared, equals the Wald statistic (Savin & Würtz, 2001). If the Wald statistic is significant (i.e. less than .05) then the parameter is significant in the model. Results show that all of the independent variables are significant in this model.

The Exp (B) is the label for the odds ratio of the row independent with the dependent (probation ever). It is the predicted change in odds for a one unit increase in the corresponding independent variable. Odds ratios less than 1.0 correspond to decreases and odds ratios more than 1.0 to increases in odds. Odds ratios close to 1.0 indicate that unit changes in that independent variable do not affect the dependent variable. In this model, for every one unit increase in predicted GPA, the odds of earning probation (ever) increase by a factor of .053 (actually decreasing in probability). For a student who is an in-state resident, the odds of earning probation (ever) increases by a factor of 2.865 (actually increasing in probability).

Table 10: Variables in the Binary Logistic Equation

Variables	B	S.E.	Wald	df	Sig.	Exp (B)
Predicted GPA	-2.933	0.165	317.882	1	0.000	0.053
Gender	-0.685	0.094	52.758	1	0.000	0.504
In-state	1.053	0.207	25.777	1	0.000	2.865
Enroll in UNIV course	-0.410	0.185	4.937	1	0.026	0.664
Join Greek	-0.344	0.141	5.951	1	0.015	0.709
Received Need Aid	0.489	0.106	21.179	1	0.000	1.631
Constant	6.417	0.496	167.403	1	0.000	612.038

## Discussion

Findings from this study point to five main conclusions. First, based on the cohort of 4,375 students in this study, there are significant differences between students who earn probation and those who do not before they ever arrive on at college. In looking at the admissions profile of students, all three probation student groups had on average 0.3 lower high school GPA, 0.3 lower predicted GPA, and 40 points lower on the SAT than students who do not earn probation.

Second, one-way ANOVAs reveal that significant differences exist between probation (ever) students and non-probation students in regards to gender, race/ethnicity, and financial aid received. For gender, the majority of the cohort population was female (58%), but the majority of students who earned probation (in all three probation groups) was male (+60%). For race/ethnicity, White and Hispanic students were less represented in the three probation groups than in the total cohort. For Asian, Black/African-American, and multi-racial students, this was reversed. These students were more represented in each of the three probation groups than in the cohort.

For financial aid received, students who earn probation (ever) had higher rates of receiving need-based aid and Pell Grants than non-probation students. In regards merit-based aid, probation (ever) students had comparable rates of receiving aid with non-probation students in the first year, but in the second year, there was a large drop off in the rate of receiving the merit-based aid by probation (ever) students and were not comparable to the rates of non-probation students. This is somewhat inherent due to merit-based aid requires a 3.0 minimum cumulative GPA to keep receiving the aid and



probation (ever) students by nature have below a 2.0 cumulative GPA at some point in their undergraduate career.

Third, students who earn probation are retained and graduate at significantly lower rates than non-probation students. Students who earn probation (ever) are 20% less likely to be retained after the 1<sup>st</sup> year than non-probation students. After the 2<sup>nd</sup> and 3<sup>rd</sup> years, the difference grows to over 30%. In most cases within the first three semesters, students who earn probation after the 1<sup>st</sup> fall make-up over 30 to 40% of the students who stopped-out or dropped-out in a particular semester. In terms of graduation, only 5% of students who earn probation (ever) graduate within 4 years as compared to 50% of students who do not earn probation. 31% of students who earn probation (ever) graduate within 6 years as compared to 83% of students who do not earn probation.

Fourth, findings from the binary logistic regression analysis provide evidence of factors that increase the likelihood of a student earning probation. Being male, an in-state resident, not enrolling in a UNIV course, not joining a Greek organization, and receiving need-based aid are significant factors that increase the likelihood a student earns probation. Also, the lower the predicated GPA of a student, the odds of that student earning probation increases.

Fifth, the low Nagelkerke  $R^2$  (.230; a pseudo OLS  $R^2$ ) coupled with the closeness of the null model's (84.6%) and the full model's (85.4%) ability to correctly predict a student not earning probation indicates the model used here can only explain a portion of why students earn probation. It appears that when a student earns probation, it is due to a combination of factors many which are not in this model due to their complexity and difficulty to quantify.

### Implications

The contributions of examining and better understanding probation students can help institutions be more successful in having their students persist and eventually graduate. As this study has shown, students who earn probation are less likely to persist and graduate. Probation students, in general bring with them lower scores to college. Creating programs targeting lower scoring students might be warranted; possibly creating an orientation session for lower scoring students where they can receive more one-to-one counseling and assistance in scheduling classes might be a start. Developing academic assistance programs for lower scoring students in their first year could also be helpful in lowering the likelihood a student earns probation.

Students on probation (ever) had significantly higher rates of receiving need-based financial aid than non-probation students. This finding is not too surprising, if you consider coupling this finding with the fact that probation students had lower test scores, high school GPA, and predicted GPA; this is consistent with the research on the relationship between measured student ability and socio economic status (McDonough, 1997; Thomas & Perna, 2004). In general, students of lower socio economic status have lower SAT and high school GPAs – measures of merit (McDonough, 1997). What really generates concerns is the low rate of graduation by students who earn probation – a larger percentage of which are from lower socio economic backgrounds. Education is one of the few (if not the only) ladders available to students from lower economic backgrounds that can help them to move into a higher socioeconomic group.

A possible influence to consider with regards to students receiving need-based aid is the extremely high presence of merit-based aid by all in-state students. Almost all in-

state students (98%) came to this institution with merit-based aid. However, only 20% of the students in this study brought need-based aid with them. This large percentage of students who brought merit-aid with them most likely influenced the rate of students receiving need-based aid. Other institutions that do not have merit-based programs within the state or lower presence of merit-aid will likely show a different influence of need-based aid on students earning probation.

### Further Study

One area to expand this study and where more research is needed is to consider using multiple cohorts of entering student classes. What is shown in this study may miss some nuances in probation behavior or a variable's contributing to probation. Another area for further exploration is to use multiple binary logistic regressions in the analysis. In this study, only one logistic regression was developed (using probation ever as the dependent variable). Developing a series of regression capturing the different probation groups might provide additional insight on students who earn probation. Another possible area for further study is to have multiple institutions included in the study. This could provide insight how institutional characteristics influence students earning probation (of particular interest would be effect of different institutions and need-based aid receipt).

### Limitations

Limitations of this study include the sample being drawn from a single institution and the use of only one cohort of students (single entering class). Another limitation is the assumption that similar courses (i.e., freshman English) provide the similar experience(s) for students. The experience one student has in a class is undoubtedly different from another student's. The inability to account for these different experiences contributes to

the limits this study can capture. Additional study across multiple institutions may also allow researchers to add one or more variables which seek to address student perceptions of the campus environment or other qualitative dimensions that may contribute to a successful graduation and retention of students who earn academic probation.

References

- Berger, J., & Lyon, S. (2005). Past to Present: A Historical Look at Retention. In *College Student Retention: Formula For Student Success*. ed. Seidman, A, 1-29. Westport, CT: Praeger.
- Hosmer, D.W. & Lemeshow, S. (2000). *Applied Logistic Regression*. 2<sup>nd</sup> edition. NY: Wiley.
- McDonough, P.M. (1997). *Choosing Colleges: How Social Class and Schools Structure Opportunity*. Albany: State University of New York Press.
- Mortenson, T. (2005). Measurements of Persistence. In *College Student Retention: Formula For Student Success*. ed. Seidman, A, 31-60. Westport, CT: Praeger.
- Pascarella, E., & Terenzini, P. (1980). Predicting Freshman Persistence and Voluntary Dropout Decisions from a Theoretical Model. *The Journal of Higher Education*, Vol. 51, No.1. (Jan.-Feb.), p.60-75.
- Paulsen, M., & St. John, E. (2002). Social Class and College Costs: Examining the Financial Nexus Between College Choice and Persistence. *The Journal of Higher Education*, Vol. 73, No.2. (March/April), p.189-236.
- Perkhounkova, Y., Noble, J. P., & McLaughlin, G. W. (2006). Factors Related to Persistence of Freshmen, Freshman Transfers, and Nonfreshman Transfer Students. *AIR Professional File*. No. 99, Spring.
- Savin, N. E. & Würtz, A. H. (2001). Empirically Relevant Power Comparisons for Limited-Dependent-Variable Models. In C. Hsiao, K. Morimune, & Powell, J. (eds.), *Nonlinear Statistical Modeling*. 47-70. Cambridge: Cambridge University Press.
- Seidman, A. (Ed.) (2005). *College Student Retention: Formula for Student Success*. Westport, CT: Praeger. American Council on Education/Praeger series on higher education.
- St. John, E., Hu, S., Simmons, A., & Musoba, G. (2001). Aptitude Vs. Merit: What Matters in Persistence. *The Review of Higher Education*, Vol. 24, No.2. p.131-152.
- Thomas, S.L. & Perna, L.W. (2004). The Opportunity Agenda: A Reexamination of Postsecondary Reward and Opportunity. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research*. Vol. XIX, 43-86. Netherlands: Kluwer Publishers.
- Tinto, V. (1975). Dropout from Higher Education: A Theoretical Synthesis of Recent Research. *Review of Educational Research*, Vol. 45, No.1. p.89-125.
- Tinto, V. (1997). Classrooms as Communities: Exploring the Educational Character of Student Persistence. *The Journal of Higher Education*, Vol.68, No.6. (Nov.-Dec.), p.599-623.
- Tinto, V. (1998). Colleges as Communities: Taking Research on Student Persistence Seriously. *The Review of Higher Education*, Vol. 21, No. 2. p.167-177.
- Titus, M. (2006). Understanding the Influence of the Financial Context of Institutions on Student Persistence at Four-Year Colleges and Universities. *The Journal of Higher Education*, Vol. 77, No.2. (March-April), p.353-375.