Probationary Admit Students: An Exploratory Study of First-Year Retention

by

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Introduction

This study was conducted in response

experience as a first-generation college student. Moore and Carpenter (1987) use socioeconomic indicators, but note that students who aren't financially underprivileged can be academically unprepared as well. However, they emphasize cognitive factors and exclude students who have performed poorly in high school. They look for those who are more ephemerally underprepared. Adelman (1998), on the other hand, develops measures of the degree of instability in high school preparation, middle-school grades, in addition to more traditional socioeconomic and engagement variables.

Most public institutions admit students who, at the outset, it acknowledges are a poor fit as determined by

Study Population

The population for this study consists of 1511 first-time-college freshmen admitted to the university on academic probation from Fall 1999 to Fall 2003.

Table 1: Characteristics of Probationary Admit Students

Population Characteristics

Ethnicity		**Gender**		**First-Generation College**		**Income**	
Caucasian	78%	Male	55%	Yes	32%	< $20,000	9%
Underrepresented Minority	16%	Female	45%	No	68%	$20,000-$40,000	11%
Other	6%					$40,000-$60,000	0

the university. Underrepresented minority students admitted on probation were retained at the same rate as probationary admits as a whole, and at the same rates as Caucasian students admitted on probation. Female students admitted on probation were retained at slightly higher rates, 5% more, than male students. First-generation college students admitted on probation were retained at 9% lower rates than students whose families had some college education. Students whose families earned less than $20,000 per year were retained at 15% lower rates than the population of probationary admits as a whole. Furthermore, they were retained at 20% lower rates than students whose families earned more than $100,000 per year. Urban students admitted on probation were retained at the highest rates (72%) among the various high school settings. Rural students, on the other hand, were retained 61% of the time. Home schooled and GED students were retained at the lowest rates, only 41%.

There was a slight difference in retention rates between students who had chosen a major and those who were undecided. Students with a declared degree program were retained at a 66% rate, while undeclared students were retained at a 71% rate. There were some differences in retention rates among students in different academic divisions. The colleges of Business, Agriculture & Natural Resources, Education, Nursing, and Journalism all had retention rates higher than for the population of probationary admits as a whole. Arts & Science, Human Environmental Sciences, and Health Professions retained students at about the same rate as the overall population, while Engineering retained students at an 18% lower rate than the group of probationary admits as a whole.

The major finding from the initial descriptive analysis indicated that students granted admission despite deficiencies in their high school core courses exhibited lower success and retention rates than did students adm

Models

The models outlined here draw upon two competing sub-literatures within the larger body of scholarship addressing studen

Table 2: Linear Regression Variables

Dependent Variable	
Cumulative GPA	
Independent Variables (pre-college/demographic)	*Independent Variables (first-year)*
Gender (dummy coded)	Took Learning Strategies Course (dummy coded)
Ethnicity—white, underrepresented minority, other dummy coded	Participated in Freshman Interest Group (dummy coded)
First Generation College (dummy coded)	Major—declared or undeclared (dummy coded)
High School Setting—urban, suburban, rural (dummy coded)	Academic unit—A&S, A&S undeclared, Ag/Natural Resources, Education, Engineering, Human Environmental Sciences, Business, Health Professions, Nursing, Journalism (dummy coded)
Income—taken from FAFSA	Combinations of English and Math courses taken in the Fall term (dummy coded)
Broad deficiency type	Combinations of English and Math courses taken in the Winter term (dummy coded)
Number of subject area deficiencies	Total credits earned in the first year
Sum of missing credits	
High School GPA	
High School Percentile Rank	

Essentially the linear regression controls for some standard demographic characteristics such as gender, ethnicity, first generation college status, and socioeconomic status, measured as income. The model adds one demographic measure not typically seen, by controlling for the geographic setting in which the student completed his or her high school requirements. Students who were non-residents, home-schooled, or who had their GED were excluded from the analysis. During the initial examination of the data, it became clear that out-of-state students admitted on probation performed nearly as well as regularly admitted students. Usually, out-of-state students are admitted on probation only because their high school requirements differ

from those in this state. Our administrators were also more interested in in-state students. The home-schooled and GED students were excluded from the analysis because their numbers were too small to make for meaningful analysis.

The second set of variables, measuring high school performance and course-taking characteristics, essentially serve as a proxy measure for a student's readiness for college work. Again some standard variables controlling for academic ability, namely the composite ACT score and high school GPA, were used. In addition, high school percentile rank was used, as there has been some debate among student service providers on campus as to which indicator is a better predictor of initial college success.

As mentioned above three measures of high school core coursework deficiency were developed and tested for this study. They move from a very general conceptualization to a more specific treatment of missing courses.

- Broad deficiency type: Students had a deficiency in the following—ACT composite score, missing high school core courses, or some combination of the two.
- Number of subject area deficiencies: the number of subjects in which students had missing coursework
- Sum of missing credits: sums the number of missing units (one unit=1 year) across all subject areas

Obviously these few variables don't exhaust the possible ways of measuring important aspects of probationary admit students' high school course-taking patterns. The high school data used for this study, however, were obtained from census files used for

statewide reporting. These datasets don't include information about grades in individual high school courses, nor do they indicate which specific courses were taken.

Finally, variables measuring first-year course taking were included. The university offers three types of first-year-experience (FYE) courses for which students may earn academic credit. A learning strategies course helps students learn how to navigate their coursework, deal effectively with faculty, plan their course of study, and effectively complete assignments and prepare for exams. The Freshman Interest Group (FIG) program combines coenrollment in 3 courses, common living areas, and a proseminar course. Students may also take major-orientation courses that provide broad overviews of the programs offered by some of the academic units on campus. None of the FYE courses are required, although students, particularly those deemed to be at academic risk are strongly encouraged to take either the learning strategies course, or participate in a FIG.

A variable indicating whether or not each student had decided on an academic program and indicating each student's initial academic unit were also included. While each student's major was available, many degree programs simply had too few students (admitted on probation) to make for meaningful analysis. At the request of the Director of Advising, variables measuring whether or not students took English composition and a math together in either the fall or winter of their first year were also included. Common wisdom on campus holds that taking these two courses together significantly disadvantages students, particularly those with weak academic preparation. A variable indicating how many credit hours students earned over the course of their first year were included as well.

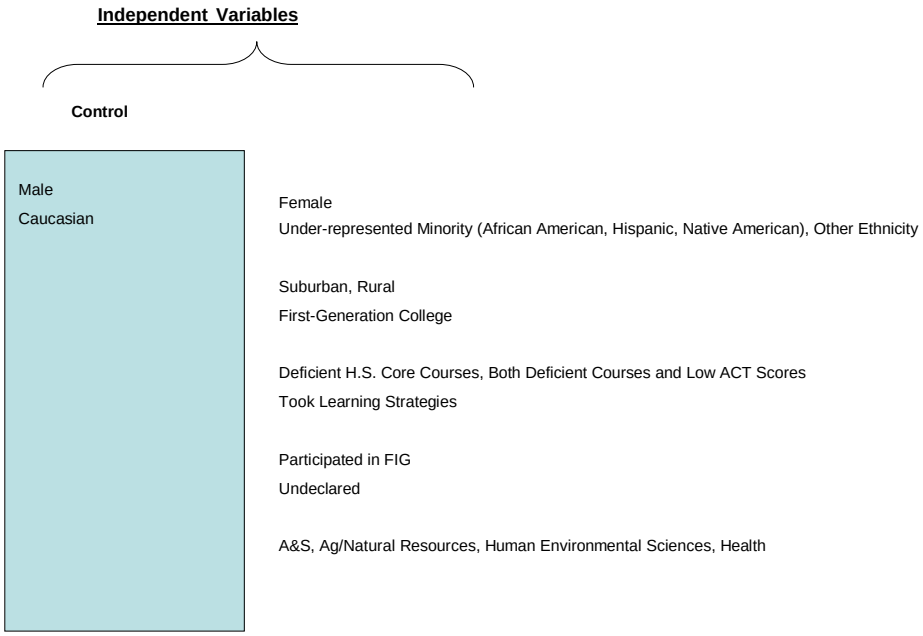
The model can be depicted as follows:

demographic characteristics + high school + first-year = GPA

Logistic Regression

The logistic models ran the same set of variables, substituting the different measures of high school coursework in the iterations. The dependent variable, however, changed from GPA to a binary variable indicating whether each student was retained.

Figure 1: Logistic Regression Model



Findings

Table 3: Three Linear Models Compared

Linear Regression

Model 1 (Broad Deficiency)		Model 2 (Subject Area Deficiency)		Model 3 (Sum of Missing Credits)	
IV	Point Estimate	IV	Point Estimate	IV	Point Estimate
Except = H.S. Core	Not Significant	Subject Deficiencies	0.00678	Sum of Missing Credits	-0.04523
Except = ACT	0.10054				
Ethnicity = Minority	-0.2278		-0.23001		-0.21721
Setting = Rural	-0.23257		-0.23441		-0.23384

measuring high school coursework, the same set of independent variables was significant across the three models.

Seven of the independent variables were statistically significant ($p<.10$) and positive. Specifically, having only an ACT composite score deficiency, the number of high school subject area deficiencies, high school GPA, high school class rank; and enrollment in Agriculture & Natural Resources, Nursing, and Human Environmental Sciences all combined to produce higher first year GPAs. In addition, taking higher credit hours throughout the first year also produced better academic performance.

The direction of most of these coefficients is as anticipated. Although, this author was somewhat surprised by the magnitude of the academic unit coefficients. They were larger than anticipated. More importantly, the direction of the coefficient for the number of subject area deficiencies was surprising. To reiterate, the number of subject area deficiencies refers to how many required subjects a student had failed to take the required number of credits. For example, a student missing credits in both high school English and social studies would have two subject area deficiencies. The positive direction of this coefficient, despite its tiny magnitude, is puzzling.

Six of the independent variables were statistically significant ($p<.10$) and negative. Being an underrepresented minority, from a rural high school, having a higher number of missing high school credits, taking learning strategies, taking a math course in the fall, and enrollment in the College of Engineering are all associated with lower first year GPAs. The direction of most of these coefficients makes sense, save for the direction of the learning strategies coefficient. Designed to improve students' study

habits and improve engagement, the negative impact on probationary admit GPAs is very surprising.

A closer examination of the descriptive statistics, however, sheds some light on this surprising finding. Only 233 students in the population analyzed here took learning strategies. According to advisors on campus only the students perceived to be most at-risk are encouraged to take the course as it has limited capacity. Moreover, they report that students frequently fail to take the course seriously. Looking at the small group of students who took the course reveals that underrepresented minority students, particularly males, were the only group to be significantly advantaged by taking the course. Importantly, taking the course improved this subgroup's chances of being retained, but did not lead to higher first-year GPAs.

Table 4: Three Logistic Models Compared

Logistic Regression

Model 1 (Broad Deficiency)			Model 2 (Subject Area Deficiency)			Model 3 (Sum of Missing Credits)		
IV	Point Estimate	Effect	IV	Point Estimate	Effect	IV	Point Estimate	Effect
Female	1.511	Positive (p<.1)		1.508	Positive (p<.1)		1.539	Positive (p<.1)
First-Generation College	0.671	Negative (p<.1)		0.679	Negative (p<.1)		Not significant	
H.S. Rank	Not significant			1.016	Positive (p<.1)		Not significant	
H.S. Core	Not significant		Subject Deficiencies	Not significant		Sum of Missing Credits	Not significant	
Both Core & ACT	Not significant							
Took Learning Strategies	0.616	Negative (p<.1)		0.613	Negative (p<.1)		0.643	Negative (p<.1)
Credit	1.325	Positive (p<.05)		1.328	Positive (p<.05)		1.317	Positive (p<.05)
n	673			673			673	
X								

estimate of 1 indicates that the tested value was as likely to be retained as the control group. The magnitudes of the odds-ratios were nearly identical across the three logistic models.

Interestingly the set of statistically significant variables changed from one model to the next, as the measure of high school coursework deficiency was altered. Only female and credit were both statistically significant and positive across all three models. Females were .511 more likely to be retained than males, while students with more credit hours completed in the first year were .325 more likely to be retained. On average, retained students earned 27 credit hours in their first year, while probationary admits who left school took only 20 hours in their first year. High school class rank was significant and ever so slightly positive only in the model testing the number of subject area deficiencies.

Only the learning strategies course was statistically significant and negative across the three models. Students taking the learning strategies course were less likely to be retained than students who did not take

more closely, however, there are only small differences in the number of missing credits between those who are and those who are not retained.

Discussion

While the results of the linear and logistic regression analyses presented here do not provide definitive answers to the research questions posed at the outset of this paper, they do offer some direction for admissions and student service personnel working directly with this population of student. First, an effective measure of a student's high school coursework as an indicator of college preparedness remains elusive. The variables introduced here performed adequately in the linear models, but failed to register as significant in the logistic models. A portion of the weakness of the measures can be attributed to the relatively small numbers in the different categories used in the analysis. Still, it is likely that a better measure, maybe something akin to Adelman's (1998) use of the number of Cs and Bs in analyzing middle school transcripts would prove to be more salient than the measures used here.

The most important finding, however, is th

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