

## **Characteristics of At-Risk Students Who Graduate**

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**Introduction**

Students, especially low-income students, face daunting challenges in entering and succeeding in higher education (Terenzini, Cabrera & Bernal, 2001; Postsecondary Education Opportunity, n.d.; U.S. Department of Education, 2006). College participation for low-income students, already problematic, appears to be decreasing. As shown in Figure 1, the 2006 college participation rate for 18 to 24 year old Pell Grant recipients was 23.8%, down from its peak of 27.6% in 1999. This contrasts to the greater and rising participation rates for 18 to 24 year olds without Pell Grants; that rate was 45.4% in 2006 and is up from 39.2% in 1999 (Mortenson, 2008). Poor academic preparation in high school, rapidly increasing tuition rates, insufficient levels of aid, and a dense jungle of financial aid processes can interact to restrict the ability of many low-income students to both enter and graduate from college.

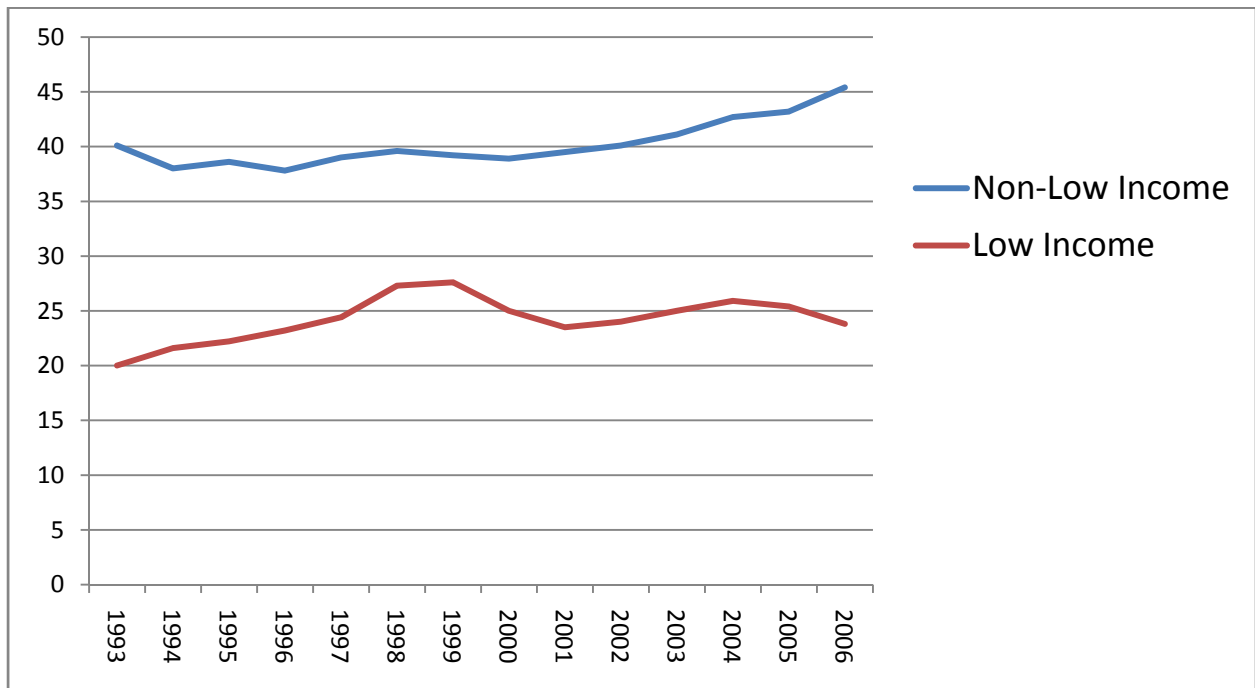


Figure 1. *College participation: Students from low-income (Pell) and all other families.*

(Mortenson, 2008)

The purpose of this study is to determine some of the correlates of success for a cohort of lower-income students who got off to a relatively poor academic start during their first semester at a large, selective, high-tuition public research university.

We know from previous multivariate analyses that both academic ability and ability to pay are statistically significant correlates of progress toward a degree at this multi-campus university. Although the university enjoys relatively high graduation rates overall (with a six-year rate of about 68% percent across all undergraduate campuses, and 84% at the main campus), only one in five lower-income freshmen who perform poorly during their first semester will graduate in six years.

The research question addressed in this paper is this: What are the characteristics of those lower-income, lower-ability students who – unlike the other 80% of freshmen in that same high-risk category – overcome financial and academic barriers to earn a baccalaureate degree within six years?

The paper explores in detail how those degree completers differ from the other students in this at-risk group, especially in terms of financial assistance, academic preparation, first-semester academic achievement, and enrollment patterns.

### **The Challenges for Lower Income Students**

Higher education scholars have done much work in the past three decades to develop sophisticated theoretical, causal models of student performance, and the cumulative and interactive effects of many personal, institutional, experiential and contextual variables have of course been examined in depth (Pascarella & Terenzini, 2005). Those variables include socioeconomic background; personality traits; pre-college academic achievement; educational and occupational aspirations; living on- or off-campus; the extent of extracurricular involvement; the nature of employment; different types and combinations of financial aid; the availability of orientation and advising programs; a student's participation in advising and orientation programs; a student's academic major; interactions with faculty members; and the list goes on.

Of particular interest here is research that points to the influence of prior academic ability and ability to pay on graduation (Braunstein, McGrath & Pescatrice, 2000; DesJardins, Kim & Rzonca, 2003;

Dooris, Guidos & Stine, 2007). Such analyses typically have examined full cohorts of students – that is, the analyses typically do not separate students by income or ability. However, as much past research has found, lower-income students at large universities do experience college life differently than their peers (Pell Institute for the Study of Higher Education, 2007). Many lower-income students are the first in their families to attend college. They may not be familiar with financial aid processes or the many services that might be available. A survey of parents on their expectations about college for their children found that only 49% of the lowest-income families believed they had enough information about college costs to begin planning (Lippman, et al., 2008). This compares to 81% of families at the highest income level. Terenzini, Cabrera, and Bernal (2001) reported that lower-income students participated in fewer extracurricular activities than other students, associated less with other students outside of the classroom, were less likely to use athletic and recreational facilities, frequented student unions less, and joined fewer student clubs.

In addition, restricted financial resources are more likely to result in lower-income students living at home with their parents. Students who live off-campus miss out on the integrative aspects of living on-campus; low-income students may be more isolated from their peers.

Researchers have also found different attitudes and approaches toward using financial aid across socioeconomic groups, with lower-income groups avoiding borrowing and taking smaller loans when they do borrow, even though the pattern of borrowing more and working fewer hours has been shown to positively impact persistence (Burdman, 2005; King, 2002). In one national study of non-completers, students who received Pell grants (typically the lowest-income students) were more likely than other students to report that their debt burden was a critical factor in the decision to stop attending (Baum & O'Malley, 2003). Working more hours, having less time to devote to studying, participating less fully in out-of-class college life, and being less well prepared academically may all lead lower-income students to struggle with college course work. In short, there is much evidence to suggest that families' inexperience with higher education and the challenges of scarcer financial resources can affect low-income students negatively.

The Pell Institute for the Study of Opportunities in Higher Education (2007, p. 53) states, “Institutions need to improve their ability to collect disaggregated data in order to improve programmatic and policy decisions about retention.” This analysis is offered in that spirit. It extends a continuing line of practical institutional research on access, affordability, and outcomes in this particular university. The hope is that this report may shed useful light on factors affecting degree completion for at-risk students at other colleges and universities, as well.

### **Pragmatic and Actionable Institutional Research**

Because of our positions as institutional researchers, we are especially interested in practical analyses that can contribute to informed decision-making and action at our university in particular. Meaningful institutional research, from that perspective, is IR that can potentially have a positive impact at the institution. That potential is most likely to be reached when institutional researchers have the luxury of developing and extending a consistent line of inquiry over time. For the topic addressed in this paper, such a line of inquiry has evolved through three parallel studies: degree completion for traditional baccalaureate students, for adult learners, and for at-risk students.

#### **First-Time Full-Time Baccalaureate Students**

Our practitioners’ objective of contributing pragmatic and actionable institutional research initially led us to explore how academic ability and ability to pay affect completion rates for first-time baccalaureate degree-seeking students (Dooris & Guidos, 2006; Dooris, Guidos & Stine, 2007). Given the composition of the student body at this university, that starting point is an obvious choice, from the perspectives of both research design and praxis.

Figure 2 shows six-year completion rates for students in the highest and lowest income and academic ability quintiles of the university’s fall 1999 entering class of 11,930 first-time, full-time baccalaureate students. “Ability to pay” is based on 1998 family income as reported on the Free Application for Federal Student Aid (FAFSA), and “academic ability” is based on first-semester grade point average. The resulting contrasts are pronounced. As shown, 89% of high-income, high-GPA students graduate within six years. That compares with the 72% graduation rate for low-income students

of similar academic ability, for a difference of 17 percentage points. And although the absolute graduation rates for low GPA students are much lower, at 36% and 20%, the difference between the graduation rates of high-income students and low-income students is similar, at 16 percentage points.

Figure 2.  
*Completion rates by academic ability and ability to pay.*

Academic Ability	High	72%	89%
	Low	20%	36%
		Ability to Pay	

Multivariate analysis using logistic regression led to the conclusion that, for whatever reasons, there are important differences in the path to a bachelor’s degree for Penn State students who are from different levels of family income but who are similar in other respects (that is, academically, demographically, in terms of academic intentions, their use of advising, and so on). In short, lower-income students may be disadvantaged in substantive ways by their families’ inability to pay for college.

**Adult Learners**

Institutional interest in and use of findings about access and affordability for all entering baccalaureate freshmen, described above, led to a second, parallel investigation that focused on one special population: namely, adult learners (Guidos & Dooris, 2007; Guidos & Dooris, forthcoming). That was viewed as a worthwhile, pragmatic institutional research project, for three reasons. First, adult learners represent an important and growing segment of the student body for this university (as is true for other research universities). Second, it was not at all clear that the university should extrapolate conclusions based on a study of all entering baccalaureate freshmen to adult learners, given the fundamentally different challenges and life circumstances of these two types of students. Third, there is relatively little research-based evidence in the literature to draw on in formulating policies and practices

to support non-traditional students in universities. In fact, a recent review of the higher education literature found that only about one percent of the articles dealt with adult students (Donaldson & Townsend, 2007). For such reasons, it appeared reasonable to question whether the correlates of success would be similar for traditional-age and adult learners.

A parallel multivariate analysis was conducted for adult learners, as a cooperative effort among institutional researchers, continuing education leaders, and adult student administrators. In brief, the results of that analysis (Guidos & Dooris, 2007; Guidos & Dooris, forthcoming) showed both similarities and differences in the correlates of success for traditional-age students and adult learners. Again, the report generated interest and conversation in the university and is seen as practical and actionable institutional research.

### **At-Risk Students**

It is with the same objective of conducting pragmatic and useful institutional research that the present study of at-risk students has been conceived. Just as adult learners differ substantively from traditional undergraduates in terms of their path to a degree, lower-income students face fundamentally different challenges than do their peers from higher socioeconomic strata.

Despite the many hurdles that lower-income students face, and the evidence that in general they are materially less likely to graduate, some of them do succeed in earning a degree. This led us to believe that special study should be made of the small group of students who are able to overcome these factors to persist and ultimately complete degrees.

### **Methodology**

As noted, this analysis extends previous work by focusing on the small number of full-time baccalaureate students in the lowest-income, lowest-ability group who graduated. The goal is to better understand how the 20% of these at-risk students who did graduate differed from the 80% who did not.

We drew the initial cohort from all full-time degree-seeking students at the university who entered during the fall 1999 semester. The full group included 11,930 individuals from across the statewide system of campuses. Because it is known that there are often substantive differences between

students at the main campus and at the other less-selective 19 campuses, this study (like many others at this university) includes a main campus-branch campus dimension; that will be explored further below.

When all 11,930 entering freshmen are separated into quintiles based on GPA earned during the fall 1999 semester and 1998 FAFSA family income, 503 students fall into the lower-income, lower-GPA cohort. All students in that cohort reported family income under \$40,453 and earned first-semester grade point averages below 2.59. The cohort includes 211 students at the university's main campus and 292 students at the other nineteen undergraduate campuses. These are, for the purposes of this analysis, the at-risk students.

The dependent variable in the analysis is completion of a baccalaureate degree within six years of first enrolling at the university. Independent variables include:

- 1) demographic characteristics, including age, first-generation status, ethnicity, gender, single or married parents, in-state residency status, and 1998 family income;
- 2) academic preparation indicators, including high school rank and English or math basic skills needs;
- 3) academic achievement based on first-semester credits earned;
- 4) indicators of integration into campus, including work-study status and use of advising services;
- 5) financial aid usage during the first year, including the total amount of federal, state, and institutional aid received, and use of loans.

In addition, location of enrollment was included in the model. Full model results for the main campus and other campuses are included; that information is important as a practical matter for this particular university.

Because of the dichotomous nature of completion and the inclusion of both categorical and continuous independent variables, we used logistic regression analysis in SAS® to identify those factors which were related to degree completion for the group of 503 students. We analyzed five models:

Model 1 – demographic indicators;

Model 2 – demographic and academic preparation indicators;

Model 3 – demographic, academic preparation, and first semester academic achievement indicators;

Model 4 - demographic, academic preparation, first semester academic achievement, and integration indicators;

Model 5 - demographic, academic preparation, first semester academic achievement, integration, and financial aid indicators.

Building and presenting the models in this way allows an assessment of the contributions that each set of variables makes to the log-odds of graduating.

A number of other variables were tested but eventually excluded, mainly because of multicollinearity with variables that added more predictive power. Those excluded variables included: SAT total score, which correlated highly with high school ranking; dollar amount of unmet need, which correlated highly with total aid; percentage of aid that was need-based, which was highly correlated with both income and total aid; completion of remedial coursework, which had near perfect correlation with basic skills needs, since almost all students who had a basic skills need completed remedial work during their first semester at the university; and years out of high school which correlated with age.

Coding for the variables is shown in Table 1.

Table 1.

*Variables and coding for logistic regression*

Variable	Coding
Six-year completion	Did not complete degree = 0, Completed degree = 1
Gender	Female = 0, Male = 1
Ethnicity	Black = 1, Other = 0; Asian = 1, Other = 0; Hispanic = 1, Other = 0; White = Reference
Parent marital status	Married parents = 0, Single, divorced, widowed = 1
First generation status	Not first generation = 0, First generation = 1
State residency in fall semester	Out-of-state resident = 0, Pennsylvania resident = 1
1998 family income (in \$1,000s)	Range = 0 to 40.4
Campus location in fall semester	Non-University Park = 0, University Park = 1
High school rank	Range = 0 to 100
Basic skills need at time of entry	Had basic English and/or Math need = 0, No need = 1
Percent of fall semester credits attempted that were earned	Range = 0 to 100
Number of advising meetings in first semester	Range = 0 to 8
Work-study status in first year	Not work-study student = 0, Work-study student = 1
Amount of 1999-00 federal, state, and institutional aid (in \$1,000s)	Range = 0 to 26.9
Percent 1999-00 aid as loans	Range = 0 to 100

## Results

The overall six-year completion rate was 26.4%. (Perceptive readers who recall that our initial questions concerned “the 20% of at-risk students who graduate” may wonder why the completion rate is now reported at 26.4%. It’s really a minor detail, but the explanation is that because this analysis looks at campus groupings separately, the quintile cut-points were recalculated for the main campus and branch campuses. That slightly changes the distribution of students across quintiles.)

As shown in Table 2, students who were male, Black American, older, first-generation, or in the bottom half of their high school class had lower completion rates than their counterparts. Two of the largest group differences related to parent’s marital status and campus location. Students with single parents (parents who were unmarried, divorced or widowed) had a completion rate of 13.7%, a rate half that of students with married parents. Students at the main campus were over three times as likely to complete degrees as were those at the other campuses. Students who earned none of the credits they attempted during the fall semester had completion rates approaching zero; only 1% completed degrees during the six years.

However, such bivariate descriptions hide much of the real story. The complex process of degree completion is better understood through the use of multivariate analysis, controlling for factors such as age, income level and academic preparation. The logistic regression results shown in Table 3 represent the results of that analysis. Each of the of the five models shown achieved significance; that is, each was able to predict completion rates better than an intercept-only (or null) model. In addition, the concordance value (the percent of cases correctly classified by the model) ranged from 75% to 83.8%. The models build upon each other, and in general the addition of variables makes for a significantly better fit.

Table 2.

*Completion Rates by Student Characteristics*

Student Characteristic	Total Students	Graduation Rate	Student Characteristic	Total Students	Graduation Rate
Total	503	26.4%	High school ranking		
Gender			Missing	37	24.3%
Female	239	29.7%	Bottom quarter	30	10.0%
Male	264	23.5%	Bottom half	96	16.7%
Ethnicity/Race			Top half	151	25.2%
Black American	135	23.7%	Top quarter	189	35.4%
Asian American/Pacific Islander	56	33.9%	Basic skills need		
Hispanic American or Puerto Rican	54	31.5%	Need	123	20.3%
White American	258	25.2%	No need	380	28.4%
Age in Fall 1999			Location		
17 years or younger	45	33.3%	University Park	211	44.1%
18 years	345	27.5%	Other campus	292	13.7%
19 years or older	103	22.3%	Fall 1999 earned credits		
First generation			No credits earned	81	1.1%
Not first generation	162	30.9%	Less than one-third	32	3.0%
First generation	338	24.6%	33 percent to 65 percent	122	18.0%
Single parent status			66 percent or more	268	40.7%
Married parents	403	29.5%	Loans as a percent of total aid		
One parent (Single, divorced, widowed)	95	13.7%	No loans	93	24.7%
In-state residency			Less than 25 percent	80	28.8%
Nonresident	74	27.0%	25 percent - 49 percent	237	26.6%
Resident	429	26.3%	50 percent - 74 percent	75	26.7%
1998 family income			75 percent - 99 percent	15	26.7%
None	14	28.6%	100 percent	3	0.0%
Under \$5,000	46	17.4%	First semester advising visits		
\$5,000-\$9,999	63	30.2%	0	329	24.9%
\$10,000-\$14,999	58	20.7%	1	103	29.1%
\$15,000-\$19,999	78	20.5%	2	43	23.3%
\$20,000-\$24,999	73	19.2%	3 or more	28	39.3%
\$25,000 -\$40,421	171	35.1%	Work-study student status		
			Not a work-study student	450	24.7%
			Work-study student	53	41.5%

Model 1 includes basic demographic variables only. If just these variables are considered, the three factors most likely to relate to completion rates for the lowest-income and lowest-ability students are age, parents' marital status, and location. The odds ratio of 0.706 for age indicates that for every one year increase in age, the odds of graduating decreases by 30%. Having a single parent decreases the odds of graduating by 71%. In this model, being enrolled at the main campus increases the odds by over 400%.

Model 2 adds academic preparation indicators to the mix. Age, parental status, and location continue to show significance, although the effects of age and location are lessened slightly. High school rank, a new variable, is significant. Every one percent increase in high school rank increases the odds of degree completion by 1.30%.

Adding the percentage of credits earned in the fall 1999 semester (Model 3) results in a significantly better fit than Models 1 or 2. (This may be a slightly confusing measure; it simply represents the percentage of credits attempted that a student successfully completed.) A one percent increase in credits earned results in a three percent increase in the odds of completion. When credits earned are entered into the model, the significance of age drops out, and the effect of being located at the main campus decreases greatly, with the odds ratio falling from 4.163 in Model 2 to 2.686 in Model 3.

Model 4 adds the number of advising meetings in the fall semester and work-study status. Model 4 finds that work-study status is a significant predictor of completion, doubling the odds of degree completion. Parents' marital status, location of enrollment, high school rank and percent credits earned retained about the same levels of prediction as in previous models.

Table 3.

*Six-Year Completion - Logistic Regression Results*

	Model 1		Model 2		Model 3		Model 4		Model 5	
	$\beta$	Odds ratio	$\beta$	Odds ratio	$\beta$	Odds ratio	$\beta$	Odds ratio	$\beta$	Odds ratio
Age	-0.348*	0.706	-0.323*	0.724	-0.235	0.790	-0.243	0.784	-0.245	0.782
Gender - Male	-0.346	0.708	-0.324	0.723	-0.473	0.623	-0.413	0.662	-0.532*	0.587
Ethnicity - Black	0.116	1.123	-0.048	0.953	-0.037	0.964	-0.068	0.934	-0.455	0.634
Ethnicity - Asian	0.352	1.421	0.491	1.634	0.669	1.952	0.701	2.015	0.616	1.851
Ethnicity - Hispanic	-0.007	0.993	0.099	1.104	0.129	1.138	0.143	1.154	-0.105	0.900
Have single parent	-1.251***	0.286	-1.254**	0.285	-1.220**	0.295	-1.233**	0.291	-1.264**	0.282
First generation	-0.017	0.984	-0.070	0.932	0.023	1.024	0.017	1.017	-0.094	0.911
In-state resident	0.169	1.184	0.208	1.231	0.092	1.096	0.176	1.192	0.165	1.180
Family income (\$1,000s)	-0.005	0.996	-0.003	0.997	-0.001	0.999	0.001	1.000	0.002	1.002
University Park Campus	1.67***	5.328	1.426***	4.163	0.988***	2.686	0.936**	2.550	0.688*	1.990
High School Rank			0.013*	1.013	0.014*	1.014	0.014*	1.014	0.015*	1.015
No basic skills need			0.200	1.221	0.240	1.272	0.223	1.250	0.308	1.360
Fall percent credits earned					0.030***	1.030	0.030***	1.030	0.028**	1.028
Advising meetings							0.092	1.096	0.080	1.084
Work-study student							0.816*	2.261	0.627	1.871
Total aid									0.099*	1.105
Percent aid as loans									-0.013	0.987
-2 Log L	488.4		448.5		406.6		401.3		393.3	
Goodness-of-fit $\chi^2$	85.7***		85.7***		127.6***		132.8 ***		140.9***	
Nagelkerke R <sup>2</sup>	.232		.247		0.353		0.365		0.384	
% Correctly Classified	75.0		76.3		82.2		83.1		83.8	

\*p<.05  
\*\*p<.01  
\*\*\*p<.001

The final model adds the amount of total financial aid received and the percentage which was aid in the form of loans. Model 5 fits better than any of the previous, more parsimonious models and correctly classifies 83.8% of the cases. With the addition of the two aid indicators, gender becomes a significant variable, and location loses some of its predictive ability. In this final model, male students were about half as likely as female students to complete degrees within six years, and students at the main campus had about twice the odds of completing a degree as students at other campuses (versus five times the odds in the more parsimonious models). Parents' marital status maintained the level of influence that it had in the original model. Students with single parents had about 28% of the odds of completing a degree as students whose parents were married. No other variable tested was as consistently important across all five models.

The large effect of campus location in these models is striking. Running the logistic regression separately for students at the main (University Park) campus and other undergraduate campuses leads to the results shown in Table 4. The model for the campuses is able to correctly classify a slightly higher percentage of the cases, though both models fit the data well. There are several significant predictors for each location, but only one of these, percentage of fall credits earned, is the same across the two location groups. At the main campus, males had one-third the odds of females of completing degrees and Black American students had odds of completing degrees that were 74% lower than other students. Total aid was a significant predictor, with every \$1,000 increase resulting in a 12.6% increase in the odds of completion and every one percent increase in the number of credits earned lead to a 2.2% increase in the odds of graduating.

In contrast, at the campuses other than the main campus, students with single parents had 92% lower odds of graduating than those with married parents. In addition, Asian American students at the campuses had five times the odds of graduating compared to other students, and work-study students had almost four times the odds of graduating as those who were not work study. Although the percentage of

Table 4.

*Six-Year Completion - Logistic Regression Results – University Park and Other Campuses*

	University Park Campus		Other Undergraduate Campuses	
	$\beta$	Odds ratio	$\beta$	Odds ratio
Age	-0.414	0.661	-0.246	0.782
Gender - Male	-1.047**	0.351	-0.162	0.850
Ethnicity - Black	-1.336*	0.263	0.110	1.116
Ethnicity - Asian	0.452	1.571	1.617*	5.039
Ethnicity - Hispanic	-0.200	0.819	-0.689	0.502
Have single parent	-0.685	0.504	-2.472**	0.084
First generation	0.330	1.391	-1.058*	0.347
In-state resident	0.259	1.296	-0.656	0.519
Family income (\$1,000s)	0.002	1.002	-0.007	0.993
High School Rank	0.014	1.014	0.008	1.008
No basic skills need	0.820	2.271	-0.251	0.778
Fall percent credits earned	0.022**	1.022	0.040***	1.041
Advising meetings	0.054	1.055	0.287	1.332
Work-study student	0.112	1.118	1.364*	3.913
Total aid (\$1,000s)	0.119*	1.126	0.148	1.159
Percent aid as loans	-0.016	0.984	-0.029	0.971
Goodness-of-fit $\chi^2$	59.8***		58.6***	
Nagelkerke R <sup>2</sup>	0.347		0.365	
% Correctly Classified	79.9		84.9	
*p<.05				
**p<.01				
***p<.001				

fall credits earned was a significant predictor across both models, the effect was greater at the other campuses. Every one percent increase in the number of credits earned increased the odds of graduating by four percent at the campuses, but only two percent at University Park.

Table 5.

*Significant predictors for six-year degree completion*

	Combined Total	University Park	Other Campuses
Age			
Gender - Male	-	-	
Ethnicity - Black		-	
Ethnicity - Asian			+
Ethnicity - Hispanic			
Have single parent	-		-
First generation			-
In-state resident			
Family income (\$1,000s)			
High School Rank	+		
No basic skills need			
Fall percent credits earned	+	+	+
Advising meetings			
Work-study student			+
Total aid (\$1,000s)	+	+	
Percent aid as loans			

Table 5 shows the variables and whether they were related (positively or negatively) to degree completion. This type of simplified presentation can be quite useful in sharing and discussing results broadly within, especially when trying to engage diverse audiences from different areas of disciplinary and professional expertise.

## **Conclusions**

Substantial evidence suggests that nationally students from lower socioeconomic strata are substantively disadvantaged in terms of access, persistence, and degree completion. Thomas Mortenson's work in particular – which has drawn on large databases over many years –provides much evidence that this ought to be a serious concern for America and American higher education (*Postsecondary Education Opportunity*, n.d.). And while the challenges reflect broad and external cultural, social, and economic realities, they are matters of considerable import to individual colleges and universities.

There are some mildly encouraging signals in the analysis presented here. Unlike in many other studies, family income is not a significant factor for these at-risk students; this suggests to us that, while affordability is clearly an issue in general for students at this university, there is not much difference (other things being equal) in the chances of earning a degree between the relatively low-income and the lowest-income students.

Some other research has found, at least as a statistical artifact, that financial aid appears to be negatively related to persistence (Dooris, Guidos & Stine, 2007; St. John, Paulsen & Starkey, 1996; Terenzini, Cabrera & Bernal, 2001). The supposition is, of course, not that financial aid as such is a problem, but that models conflate aid with students' underlying need, and/or that the amounts of aid are simply not adequate to meet real need. Those sensible explanations are borne out by the positive relationship between aid and completion for the low-income students examined in this analysis. By the way, the institution in question is a very high tuition public university (its 2007-08 tuition rates in excess of \$12,000 are among the highest of any public college or university in the U.S.). It seems reasonable to conclude, based on the results of this analysis and on common sense, that sufficient aid directed to needy students does in fact help students to succeed.

The results showed no statistically significant relationship between basic skills deficiencies and the likelihood that a student will earn a degree. At this university, students take a battery of pre-entry tests (usually in the summer) to direct them, as appropriate, into developmental courses in English and mathematics. There is a widely held suspicion among faculty and staff that the weakest of these students

are, in effect, beyond remediation. The evidence examined here, happily, does not necessarily provide strong support for that argument. On the other hand, because the majority of these students had at least some basic skills deficiencies, the lack of a statistically significant finding here is perhaps in part an analytic artifact. The result is, at best, therefore only mildly encouraging.

Questions that are mostly of interest, but of considerable interest, within this particular university concern the effects of campus location. The main campus is considerably more selective and admits a higher socio-economic strata, more academically qualified freshmen class. SAT scores of entering baccalaureate freshmen are evidence of this difference; mean SAT scores are 1190 at the main campus and 982, on average, at all other undergraduate campuses (Penn State, 2008). It is therefore no surprise to see data implying that enrollment at the main campus relates positively to graduation. However, it is also important to note that as more information is added to regression models, the apparent advantage for the main campus drops very sharply. For example, in Model 1 (which includes 10 independent variables), the odds ratio associated with enrollment at the main campus is huge, at 5.328. However, that seeming advantage drops steadily as more variables are added. In Model 5 (which includes 17 independent variables), the odds ratio associated with enrollment at the main campus drops to 1.990. This analysis (like any social science model) is only a partial depiction of reality, and one suspects that there may be little if any real-world disadvantage for at-risk students relating to enrollment at a campus other than the main campus.

There are also hints that students can be helped in making the transition to college, and that integration into the institution matters. Participation in work study is a positive correlate of degree completion, as is early academic success. Students who pass most of their first semester course work significantly improve their odds of earning a degree. These are clues, at least, that summer orientation programs, good advising, first-year seminars, and similar mechanisms for students to successfully transition to college might be especially valuable for students who are most at risk. This notion is, of course, consistent with a substantial literature on the importance of what colleges can do to affect persistence and success (Pascarella & Terenzini, 2005).

That said, on balance it is difficult to view data such as these optimistically. The disparities are serious. True solutions realistically may require greater attention, broader social awareness, and more vigorous economic commitment if disadvantaged students are to succeed in this institution, or in equally selective colleges and universities.

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