

UIC Office for Research on Student Success



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Under the direction of the Office of the Vice Provost for Undergraduate Affairs, the UIC Office for Research on Student Success conducts translational research to improve college retention and graduation rates.

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Predicting Student Success

Student, Family, and Pre-Matriculation Factors at a Diverse, Urban University

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The advantages of attaining a college degree have been well documented (Rostron, Boies, & Arias; U.S. Department of Health and Human Services, 2012), though for many the dream of graduating from a 4-year institution has remained elusive. In 2011, the U.S. Department of Education (2014) reported that the 6-year graduation rate from all 4-year postsecondary institutions was 59%, with even lower rates for 4-year public institutions. Disaggregating the data demographically, we see even more astonishing results: 70% of Asian/Pacific Islander women graduated within six years, whereas only 33% of African American men had graduated within the same timeframe. With respect to socio-economic status (SES), 79% of highest SES students graduated within six years, compared to only 54% of lowest SES students. One salient factor in college completion was first-to-second year retention rate, which appeared to be a major milestone towards college graduation.

Though prior research mainly studied pre-matriculation factors of student success vis-à-vis issues of access and student aid (e.g. Cohn, Cohn, Balch & Bradley, 2004; Geiser & Santelices, 2007), there is still a need to understand the determinants of student success in a broader context. Some breakthroughs in this research have been instrumental in identifying key factors that lead to success. One finding is that high school GPA is a more accurate predictor of college success than standardized test scores, such as

the ACT and SAT (Bowen, Chingos, & McPherson, 2009; Geiser & Santelices, 2007; Geiser & Studley, 2002). The authors of these studies argue that GPA measures students' abilities in the kinds of learning and testing environments they will encounter in college, unlike a single nationally standardized test, which measures abstract performance at only one moment in time.

Despite the significant findings garnered from this research, one drawback has consistently been the limited use of predictor variables. One study (Zwick & Sklar, 2005), for instance, found that ethnicity and home language were significant predictors of success, while another looked at race and SES (Walpole, 2008) or gender and race (Cokley & Moore, 2007). Studies by Geiser and Studley (2002) and Geiser and Santelices (2007) notably have broken the mold by considering many variables simultaneously. In addition, the Geiser studies were seminal in proposing the robustness of high school GPA as a predictor variable of postsecondary success.

The Current Study

Building upon the work of Geiser and his colleagues, the current research explored a broad range of pre-matriculation factors that predict student success, though in a more comprehensive manner (from the standpoint of predictor variables) and with a more ethnically-diverse sample than the prior studies. Also, the current study used two additional outcome variables: first term in college GPA and first-to-second year retention. These were added acknowledging that first term GPA is highly predictive of graduation and retention is a point in a student's career representing the most significant declension in college retention. The following were hypothesized: (1) Both student/family background factors (i.e., ethnicity, gender, age, parent education, parent income) and pre-

matriculation academic success (i.e., high school grades, ACT scores, AP credits earned, writing course placement) would be associated with the three indicators of students' success in college; (2) Pre-matriculation academic success would be a better predictor of student success, compared to student/family background factors; (3) High school grades would be the strongest predictor of student success, compared to the other pre-matriculation academic success variables.

Methods

The sample from this study consisted of 10 consecutive cohorts of first-time/full-time freshmen (fall semester 2004 through 2013) from a large, urban university in the Midwest ($N = 30,001$). The students were 55% women, with a mean age of 18.08 years, and ethnically diverse (35% White, 24% Asian American, 21% Latino/a, 9% African American, and 7% others). Many (63%) had at least one parent with a college degree and the average household income was

\$65, 682; 44% were eligible for federal Pell funding. Measures included student/family background (i.e., ethnicity/race, gender, age, first generation to go to college) and pre-matriculation factors (i.e., high school GPA, AP credits earned, ACT composite score, writing course placement). The outcome variables included first-term GPA, first-to-second year retention, and six-year graduation. All data were gathered from secure student records housed in the university's data warehouse and a survey students completed during orientation.

Group differences were explored through analysis of variance (ANOVA). Multivariate regression techniques (specifically logistic regression for binary outcome variables relating to retention and graduation status and hierarchical linear regression for first-term GPA) were used to

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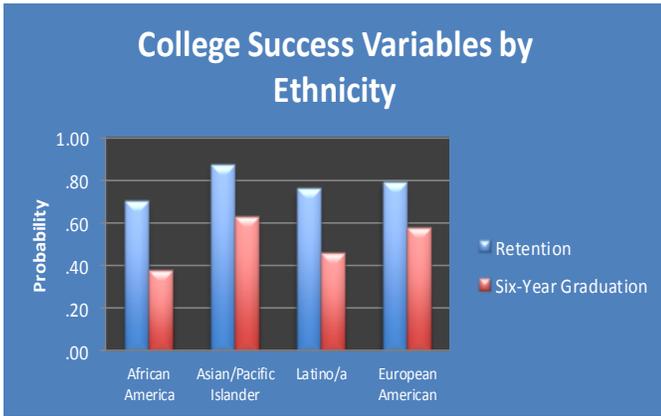


Figure 1. Probability of Achievement of College Success Indicators by Ethnicity: First-to-second-year retention and graduation in six years.

determine the relationship between the predictor and outcome variables.

Results

Group differences by ethnicity were statistically significant for all the outcome and pre-matriculation variables (Figure 1). Generally speaking, African American and Latino/a students had the lowest rates of success and were the least prepared for college as indicated by high school grades, AP credits earned and ACT composite score.

Pre-matriculation achievement factors were better predictors of student success compared to student/family background, with high school GPA being the most robust (Figure 2). AP credits earned, though receiving scant attention in the literature, also was statistically significant



Figure 2. Probability of Second-Year Retention by High School GPA

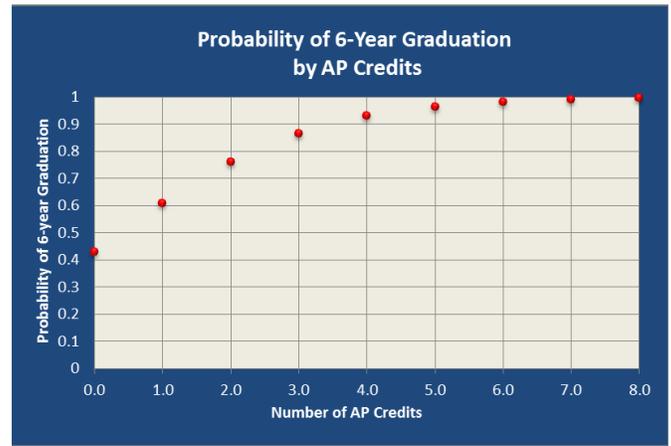


Figure 3. Probability of 6-Year Graduation by AP Credits

across all three of the outcome variables (Figure 3). ACT scores and the writing placement exam were significant predictors for first-term GPA, but were not significant for retention or graduation.

With respect to student/family background factors, while family income and parent education were weakly associated with first-term grades, these were not significant predictors of graduation. Though race/ethnicity were the strongest background factors related to student success, the associations were smaller than for the pre-matriculation factors.

Discussion

One of the more important findings from this study is the significant relationship between pre-matriculation factors, such as high school GPA and AP credits earned, and future college success. College admissions have traditionally looked to standardized tests scores as an objective measure of student ability, though this study provides evidence that ACT does not predict graduation when taking into account high school grades and AP credits earned.

The finding that parent income and education were non-significant for college graduation contradicts another study (U.S. Department of Education, 2014). It may be the case that robust need-based financial aid at the host university may explain this disparity.

This study also calls for a more robust examination of ethnicity upon outcomes of college success, for when levels of preparedness and family factors were taken into account, there was still a main effect for ethnicity: African American students had the strongest (although still small) effect size, followed by Latino/a students. This suggests that the heightened risk for academic failure for African American and Latino/a students is not due only to preparedness and resources, but also to other factors, perhaps related to institutional dynamics, experiences of racism, or stereotype threat.

Limitations and Future Directions

Since it is unclear how high school success, particularly high school GPA, predicts college success, it may behoove researchers to examine this connection contextually. Also, as the achievement gap remains a persistent issue in education, this study suggests that more research is needed to explore the problem of ethnic/racial achievement differentials through the lens of non-cognitive factors, such as stereotype threat and academic mindset.

Implications

Research should be used to inform admission decisions and the type of support students need once they arrive on campus. As stated in our study, at many institutions, admission decisions are made using a variety of metrics, but predominantly, rely upon the results of standardized tests such as the ACT and SAT. Our findings suggest that admission policies that call for using a greater variety of factors—most notably, high school grades—would result in first-year cohorts that are more likely to succeed.

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