



The Role of Institutional Practices in College Student Persistence

Results from a Policy-Oriented Pilot Study

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While student persistence has long interested institutions of higher education (IHEs), pressures have increased in recent years to attend to it. The reasons for this are both internal (e.g., higher tuition revenues associated with lower dropout rates) and external (e.g., *U.S. News & World Report*'s use of retention measures in its annual ranking of IHEs). Additionally, federal policy makers are expressing interest in outcome indicators for IHEs that include some measure of persistence—as retention is often used as a measure of institutional effectiveness. Although a spate of empirical studies testing the properties of various theoretical models of student persistence have been published, relatively few assessments of campus programmatic retention initiatives have emerged that can help policy makers in their decision making (Patton, Morelon, Whitehead, & Hossler, 2006; Tinto, 2006-2007). Indeed, many campus administrators acknowledge that while they have implemented retention initiatives, they have little evidence as to whether they are effective.

This growing interest has led researchers to explore student persistence in new ways. Recently, a line of thinking led by Braxton and colleagues (Braxton, Hirschy, & McClendon, 2004; Braxton & McClendon, 2001-2002) and Hossler and colleagues (Hossler, 2005; Stage & Hossler, 2000) has focused on the student behaviors and institutional practices that bear on college student retention. These institutional practices—sometimes termed “policy levers” (Braxton & McClendon, 2001-2002; Pascarella & Terenzini, 1991)—include (a) using recruitment practices that support the fulfillment of students’ academic and social expectations of college, (b) implementing structures and practices shown to alleviate students’ experience of racial discrimination and prejudice on campus, (c) applying fair administrative and academic regulations, (d) directing students through academic advising toward satisfactory course

experiences, (e) supporting and developing active learning strategies in the classroom, (f) providing workshop training in stress management and career planning, (g) supporting frequent and significant interactions between students and peers in orientation and residential life practices, and (h) providing need-based financial aid.

Identified through both theory and research, some of these levers have well-developed empirical records supporting them; others need to be explored further in research before we can understand how they relate to student retention. For example, research has found a positive link between the fulfillment of students' academic and social expectations of college and their social integration at the institutions they attend (Braxton, Vesper, & Hossler, 1995; Helland, Stallings, & Braxton, 2001-2002). The role of academic advising in student retention, however, has seen relatively little exploration (Hossler, 2005). The roles of still other levers—for example, career-advising practices—are subjects of some debate (Patton, Morelon, Whitehead, & Hossler, 2006; Peterson, 1993). Little can be known about the roles these levers play without more direct inquiry into whether and how institutional practices affect student retention, particularly through studies that include multiple institutions (Braxton, 1999).

The work represented in this paper examines the effects of institutional practices on retention and looks for the similarities and differences in these effects across diverse institutional contexts. We present here results from the second year of a funded pilot study exploring the linkages between campus policy and student persistence. We also discuss the two-year process of designing and revising the survey instrument for the study. Looking across multiple institutions—with their diverse missions, student demographics, and geographic locations—this study illuminates the role of students' experiences with specific institutional practices in supporting students' persistence in college.

Theoretical Framework

Student persistence is often viewed through the lens of the evolving theoretical understanding of the processes affecting students' decisions. Researchers have for decades been extending, critiquing, and refining the empirical base supporting Tinto's influential model of student departure (Astin, 1993; Braxton, Sullivan, & Johnson, 1997; Hurtado, 1997; Jalomo, 1995; Murguia, Padilla, & Pavel, 1991; Nora, Attinasi, & Matonak, 1990; Nora & Cabrera, 1996; Pascarella & Terenzini, 1991; Porter, 1990; Rendón, Jalomo, & Nora, 2000; Tierney, 1992). As scholars of higher education continue to build theory surrounding persistence, identifying propositions within the interactionalist model for which more certain evidence is available, more specialized studies have emerged. Research has shown, for example, that students' commitment to the institution at the end of their first year of college—i.e., subsequent institutional commitment (Tinto, 1993)—is a strong predictor both of students' intent to persist (Bean, 1983) and of student persistence itself (Strauss & Volkwein, 2004). Braxton and colleagues (Braxton et al., 2004; Braxton & McClendon, 2001-2002) have laid the groundwork for further exploration of social integration as a factor contributing to subsequent institutional commitment. In turn, Tinto and colleagues (Tinto, 1998; Tinto, Russo, & Kadel, 1994) have examined the link between academic integration and subsequent institutional commitment.

Refining theoretical representations of the processes students follow in their persistence decisions is one necessary task for higher education research on student success. Another is connecting these premises in an empirically grounded way to how institutional policy levers shape students' journeys through institutions. Taken together, these connections and the remaining gaps make new inquiry into how institutions can and do affect students' institutional commitment particularly relevant.

In their new conceptual framework for research on student success, Perna and Thomas (2006) propose the following:

Given the range of disciplinary approaches that are used and the applied nature of the research, researchers in the field of education are well positioned to lead efforts that not only reflect the orientations of academic scholars but also address the need of policymakers to identify practical ways to improve student success. (p. 24)

Building on this recommendation, we are attempting to engage with theory on the way to informing practice. Following a brief review of previous research on the institutional role in student persistence, this paper traces three dimensions of our effort: first, the quality and potential of a new student survey as revealed through regression analyses on fall-to-fall student persistence at three institutions; second, the implications of these findings for institutions; and third, the strengths and limitations of the current study as we develop a plan for future analyses and revisions of the study.

Previous Research on the Institutional Role in Student Persistence

Research on student departure from college, as noted above, has focused on student background characteristics and attitudes. In a recent address, ASHE President Estela Mara Bensimon (2007) pointed out that the retention literature has drawn too narrowly on theories that link student departure to the characteristics and behaviors of students, thus obscuring the role of institutions and institutional practitioners—shown in recent work (Dowd et al., 2006) to be pivotal in the success of high-achieving students of color. That students' experiences within institutions are shaped by policies and everyday practices occurring on campus is undeniable, but institutions lack research evidence on the complex yet concrete realities of how these policies

and practices affect student persistence (Tinto & Pusser, forthcoming). With this kind of research to guide their decision making, institutions and policy makers could reach beyond the constraining emphasis on “inputs” (Astin, 1994) and the cynical view implicit in that emphasis: “demography is destiny” (Engle & O’Brien, 2007).

Wide and varied research has been published on specific programmatic interventions, such as supplemental instruction (Congos & Schoeps, 1999; Gattis, 2002), developmental education (Boylan, Bliss, & Bonham, 1997; O’Hear & MacDonald, 1995), orientation programs (Peterson & Borden, 1993; Guthrie, 1992), and first-year seminars (Barefoot, 2005; Tobolowsky, Cox, and Wagner, 2005). How these dynamics play out in different institutional contexts has been explored only in the work of David Lavin and colleagues, however, according to the comprehensive literature review of Pascarella and Terenzini (2005). Looking at the influences of institutional policies and practices on student outcomes across the two-year versus four-year colleges in the City University of New York (CUNY) system, Crook and Lavin (1989) found important differences in different institutional settings. Apart from that now dated study, unfortunately, there has been relatively scant research specifically focused on how institutional policy and specific practices affect student persistence within specific contexts.

Data and Research Method

Our research centers on this question: *How do students’ experiences with institutional policy levers (such as orientation, advising, etc.) affect student persistence?* To investigate the role of institutional practices and structures in combination with student behaviors in students’ persistence to the second year of enrollment at the same institution, we collected primary data on full-time, first-time, first-year students at three four-year colleges and universities in three states. The actual names of these institutions have been replaced here with pseudonyms—Coastal

University and Urban University, two commuter campuses; and Residential College, a historically Black college. The pilot study survey, administered as a written questionnaire completed in classes at the three institutions, contained items on the behaviors and experiences of students in their first year at the institutions as well as items on students' attitudes and beliefs related to college. Institutional data on student background characteristics, precollege academic experience, and enrollment were merged with student questionnaire data. The response rates at Coastal University and Urban University were 60 percent and 43 percent, respectively, while Residential College had a response rate of just over 45 percent.

We used logistic regression to examine our research question because the outcome of interest is a dichotomous variable capturing students' persistence. In this case, using ordinary least squares would violate Gauss-Markov assumptions that the error term was normally distributed and the dependent variable continuous. Below, the general logit model is provided in Equation 1, where P is the probability that the student persisted in the same institution to the following year.

Equation 1: Logit models

$$\ln\left(\frac{P_i}{1-P_i}\right) = x_i\beta + \varepsilon_i$$

Included in the model for each institution (see Equation 2 and Table 1, below) were specific variables—entered in two blocks: (a) student background characteristics (β_1), including gender, race/ethnicity, financial certainty, and combined SAT score; and (b) student experiences in college, including interactions with faculty, advisors, and other students, as well as perceptions and experiences regarding financial aid, orientation, first-year seminars, academic support, courses, family encouragement, and racial/ethnic or cultural diversity on campus (β_2).

Institution-Specific Factors

Factors were created from the responses to survey questions on students' experiences with specific institutional policy levers. These survey questions had been created following the first pilot study, in which few of the policy levers were found to be significant predictors of student persistence. Many of the questions in the first pilot study, however, had measured student participation only. Regarding orientation, for example, participants had been asked only whether they had participated in orientation activities. Before revising the survey, we searched the literature as well as communications from professional academic organizations associated with orientation programs to identify the common purposes and goals of orientation programs. We developed a set of survey questions to probe student participants' experiences relative to specific outcomes, including what they learned at their institution about being a successful student, whether they made social connections with their peers, and whether they learned how to get help with health, academic, and financial concerns. These survey questions were then measured for factor strength.

The second block of variables incorporated several factors created using exploratory factor analysis that encompassed student experiences and outcomes related to relevant services and programs (e.g., orientation, advising, first-year seminar). The model for each campus included factors generated through exploratory factor analysis using only the responses of that institution's students. Preliminary examination of the emerging factors indicated low correlations between the factors. Therefore, the factors were considered unrelated and varimax (orthogonal) rotation was employed. The scree plot and eigenvalues greater than or equal to 1.00 were used to determine the number of factors to retain in each institution's model. All factor loadings above 0.3 were considered in determining factor solutions during each analysis.

Coastal University responses produced nine factors: orientation, advisor interaction, faculty interaction, student interaction, perception of bias, financial aid, social activities, perception of diversity, and quality of advising. Table 1 displays the factors and their component variables.

Factor Name	Variables	Alpha (factor reliability)
Orientation	Learned how to be a successful student at this college Learned where on campus to get help with financial concerns Learned about where to get help with academic concerns Learned how to receive assistance with health-related issues on campus	0.82
Advisor Interaction	Received support or encouragement from advisor Received academic feedback from advisor Received academic assistance from advisor Met with an academic advisor	0.90
Faculty Interaction	Received academic support or encouragement from faculty Received academic assistance from faculty Met with faculty during office hours Received academic feedback from faculty	0.71
Student Interaction	Received support or encouragement from students Received advice about program of studies and courses from students Received academic assistance from students	0.84
Perception of Bias	Observed racist behavior on campus Observed antigay/lesbian behavior on campus Observed sexist behavior on campus	0.80
Financial Aid	Has taken advantage of all federal and state funding aid programs for which student is eligible Degree of satisfaction with financial services offered on campus Has accurate knowledge about financial aid option on campus	0.69
Social Activities	Has formed close personal relationships with other students Socialized with students from different backgrounds Satisfaction with social experiences on campus	0.72
Perception of Diversity	Course experiences that enhanced understanding of the history, culture, or social concerns of people from diverse backgrounds Course experiences that included contributions from students with diverse backgrounds and perspectives Noticed the influence of multicultural perspectives in campus surroundings Socialized with students from different backgrounds	0.77
Quality of Advising	Academic advisor knowledge about requirements for specific courses Academic advisor knowledge about degree requirements Academic advisor knowledge about student's academic goals Certainty of student about receiving useful academic advising	0.83

One factor (quality of advising) with a high alpha level (0.83) was not included in the logistic regression model for Coastal University. The questions in this factor showed a high item nonresponse rate, an observation that was unique to this campus among those participating in the study, and for this reason we left the factor out of the model.

The Urban University model has two factors, academic support and perception of bias, displayed in Table 2.

Table 2. Urban University Factors and Variables		
Factor Name	Variables	Alpha (factor reliability)
Academic Support	Times attended a workshop for building academic skills	0.47
	Times met with a faculty member during office hours	
	Times received assistance from the campus writing center	
Perception of Bias	How often observed racist behavior on campus	0.82
	How often observed sexist behavior on campus	
	How often observed homophobic behavior on campus	

A total of two factors, first-year-experience seminars and academic support—displayed in Table 3—results from these analyses with Residential College responses.

Table 3. Residential College Factors and Variables		
Factor Name	Variables	Alpha (factor reliability)
First-year Experience Seminars	Learned about where to get help with academic concerns	0.53
	Made friendships with my fellow students	
	Learned about where to get help with academic concerns	
	Learned about what it takes to be a successful student at this college	
Academic Support	Used services offered by a campus-sponsored tutoring program	0.86
	Heard an instructor recommend that students use academic support services	
	Attended a workshop for building academic skills	

We ran a Cronbach’s alpha analysis, a numerical coefficient of scale reliability, for all the factors before using them in subsequent analyses. Applying Nunnally’s (1978) standard for an acceptable reliability coefficient, we used factors with Cronbach’s alpha coefficient greater or equal to 0.7 in the analyses—with the exception of one factor: academic support, which had

Cronbach's alphas of 0.47 (Urban University) and 0.53 (Residential College). Although the academic support factor has a value less than 0.7 for both institutions, it was included in the analysis because we considered it important to our conceptual framework in the institutional role in supporting student persistence. Furthermore, according to Kent (2001), Nunnally later revised his recommendation of suitable alpha levels to suggest that alpha levels as low as 0.5 can be appropriate in preliminary research.

Institution-Specific Models

The structure of the logistic regression model on persistence for the three institutions in this analysis is displayed in Table 4, below, with the factors and other variables included in the model for each institution. Tables summarizing descriptive statistics for each institution are included in the Appendix. Below, the persistence model is provided in Equation 2.

Equation 2: Persistence model

$$Persistence = x_i\beta_1 + x_i\beta_2 + \varepsilon_i$$

Because the student body of Residential College is homogeneous in race/ethnicity and gender, we omitted race/ethnicity and gender variables from that institution's model. Also, the SAT variable as a measure for academic preparation was removed from that model as all the students of Residential College were high achievers in high school.

Multicollinearity and autocorrelation tests were conducted to identify possible deficiencies in the models before running the regression analysis. These tests revealed no strongly correlated relationships among the independent variables or residuals. In addition, examination of a casewise listing of residuals revealed no extreme outliers to be unduly

influencing the fit. Cut points for classification of cases in the logistic model were set for each model according to observed prior probabilities of the institution's respondents who enrolled in the second year at the same institution (Chatterjee & Hadi, 2006).

Table 4. Logistic Regression Model on Persistence for the Three Institutions

Institution	Student Characteristics (Block One)	Institutional Practices (Block Two)
Coastal University		
	White Female Certainty of funding Combined SAT score (in 100s)	Orientation ^F Advisor interaction ^F Faculty interaction ^F Student Interaction ^F Perception of bias ^F Perception of diversity ^F Financial aid ^F Family encouragement Transition support Friends network Late assignments Staff respect for students
Urban University		
	Female 21 years old or older	Work off campus Transition support Friends network Connection with campus Family encouragement Class absences Perception of bias ^F Academic support ^F
Residential College		
	Certainty of funding	First-year experience ^F Academic support ^F Family encouragement Late assignments Work off campus Transition support Connection with campus
<i>Note:</i> ^F indicates a factor		

Results

Retention rates among the three institutions were all relatively high: 94 percent at Coastal University, 88 percent at Urban University, and 96 percent at Residential College. Despite these high numbers, meaningful models were estimated for each school. Results from the regressions reveal at each campus a unique constellation of factors influencing student persistence. The strongest predictor in each of the models—family encouragement—was the only variable that was significant at all three schools. When students perceived greater family encouragement, they were more likely to stay enrolled at the same institution. Other variables that were important predictors of student retention at these schools were students' satisfaction with support during transition and students' perception of bias on campus. In the case of both Coastal University and Urban University, students that perceived better transitional support were more likely to remain enrolled. Also, students that reported observing more incidents of racism, sexism, or homophobia on campus were more likely to remain. The specific models for each of the institutions are explored in more detail below.

Coastal University

Coastal University, a large, public, Western university, retained 94 percent of the students that participated in the survey. The 350 survey respondents (8% of the first-year population of the university) represent a 60-percent response rate. While the population of survey respondents resembled the university population in terms of gender, some differences appeared regarding race. White students and students who did not indicate race in their survey responses were overrepresented, while minority students were underrepresented. The largest discrepancies were

among Latino/a and African American students—the latter group making up 5 percent of the university population but only 2 percent of the study population.

Table 5, below, shows the complete regression results for Coastal University. Likelihood ratio chi-square tests suggest that both the overall model and the policy block are significant ($p < .001$ for both the block and the model), indicating that the full model contributes to the prediction of student persistence at the university. The Nagelkerke R^2 indicates a modest amount of the overall variation in retention is explained by the variables ($R^2 = .31$). Moreover, although the model does not improve the prediction of students who reenroll (72.5% of this group were correctly predicted), the model did correctly identify 83.3 percent of those who were not retained. This is a significant improvement over alternative methods of prediction.

Variables	Odds Ratio	Sig.
Race (White)	0.34	*
Female	1.82	
Certainty of funding	1.09	
Combined SAT score (in 100s)	1.85	**
Orientation ^F	1.11	
Advisor interaction ^F	1.21	
Faculty interaction ^F	1.08	
Student interaction ^F	1.15	
Perception of bias ^F	2.11	**
Financial aid ^F	0.93	
Perception of diversity ^F	1.27	
Friends network ^F	0.65	
Family encouragement	4.58	****
Transition support	2.54	**
Late assignments	0.64	
Staff respect for students	0.73	
% correctly predicted: Persisters		72.5
% correctly predicted: Nonpersisters		83.3
Nagelkerke		0.309
* $p < .10$, ** $p < .05$, *** $p < .01$, **** $p < .001$		
^F represents a factor		
n=350		

A number of variables were significant predictors of students' retention at Coastal University. Among the variables in the student demographic block, minority students were less likely to stay at the university into their second year ($\text{Exp}(\beta) = .34, p < .1$), and minority students with higher SAT scores were more likely to do so ($\text{Exp}(\beta) = 1.85, p < .05$) in comparison to their White peers and minority students with low SAT scores. Students who reported more observations of racist, sexist, or homophobic behavior on campus ($\text{Exp}(\beta) = 2.11, p < .05$) were more likely to persist than those who reported fewer of these observations. In addition, those students who reported being more satisfied with the support they received from the university in their transition to college ($\text{Exp}(\beta) = .254, p < .05$) were also more likely to be retained in comparison to their peers who felt less satisfied. Finally, the most powerful predictor of student retention was the student's perception of the support they received from their family ($\text{Exp}(\beta) = 4.58, p < .001$). Students with higher levels of perceived family support were much more likely to stay enrolled than those who reported lower levels.

The results of the regression point to some intuitive findings as well as some intriguing directions for future exploration. Support from family members makes much sense as a predictor for retention, for example, and stronger support for transitioning to college does as well. Interestingly, however, neither the factor for orientation nor that for first-year experience programs was a predictor for retention. Also, the finding about the perception of bias seems counterintuitive initially, but it likely represents the responses of students more aware of events on campus and with higher levels of consciousness about diversity issues. Finally, the results point to a need for Coastal University to make sure minority students and students with weaker academic preparation receive necessary support in their first year.

Urban University

Urban University, a fairly large public university in a large Midwestern city, retained 88 percent of its students between year one and year two of the study. A total of 184 valid first-year student responses were included in the analysis. This represented 43 percent of the eligible students in the classes surveyed. Unlike the survey respondents at Coastal University and Residential College, a number of upper-class Urban University students enrolled in target classes completed the survey; they were not included in this initial analysis. Compared to the university population, males and Asian students were slightly overrepresented; females and White students were slightly underrepresented.

Both the overall regression estimation and the policy block were significant ($p < .001$ for both on the chi-square tests). The model accounted for 37 percent of the differences in retention among students according to the Nagelkerke R^2 ($R^2 = .37$). Like the model for Coastal University, discussed above, the model for Urban University does not provide an improvement on predicting students retained (79% were predicted correctly; if all students were assumed to be retained, the model would be accurate 88% of the time). However, 84 percent of nonpersisting students were correctly classified; thus, this would be a useful tool for this institution. The full results of the regression can be found in Table 6, below.

Several demographic and policy-oriented variables were significant in the regression equation. Female students were less likely to be retained ($\text{Exp}(\beta) = .26$, $p < .1$) than male students. Nontraditional students (those 21 years old or older at the time of the survey) were over six times more likely to remain at the university ($\text{Exp}(\beta) = 6.51$, $p < .05$) in comparison to those less than 21 years old. Students who sought out more academic support services ($\text{Exp}(\beta) = .43$, $p < .1$), who worked more hours off campus ($\text{Exp}(\beta) = .65$, $p < .05$), and who had a larger network

of friends ($\text{Exp}(\beta) = .42, p < .05$) were significantly less likely to stay enrolled than their peers who utilized less academic support services, worked fewer hours off campus, and did not have an established social network. Like those at Coastal University, students at Urban University who felt more support with their transition to college ($\text{Exp}(\beta) = 2.34, p < .05$), who reported observing more incidents of discrimination on campus ($\text{Exp}(\beta) = 3.08, p < .1$), and who reported higher levels of family support ($\text{Exp}(\beta) = 3.14, p < .001$) were more likely to persist in comparison to their peers who felt less transition support, observed fewer incidents of discrimination on campus, and perceived less family support.

Variables	Odds Ratio	Sig.
Female	0.26	*
21 years old or older	6.51	**
Academic support ^F	0.43	*
Perception of bias ^F	3.08	*
Work off campus	0.65	**
Transition support	2.34	**
Friends network	0.42	**
Connection with campus	1.69	
Family encouragement	3.14	***
Class absences	0.68	
% correctly predicted: Persisters		79.1
% correctly predicted: Nonpersisters		84.2
Nagelkerke		37.7
* $p < .10$, ** $p < .05$, *** $p < .01$, **** $p < .001$		
^F represents a factor		
n=184		

Urban University's results display some interesting similarities to and differences from those of Coastal University. Students were more likely to remain enrolled for many of the same reasons: satisfaction with support during transition, encouragement from family, and greater awareness of discrimination on campus. Some of the other variables are perhaps more specific to

the population of Urban University, where the student population is relatively nontraditional and older and more likely to be retained. Students who work a greater number of hours, however, are less likely to continue their studies at the same institution—an avenue for further exploration. Finally, those that seek more venues of support were less likely to be retained.

Residential College

Students at Residential College were the most challenging set of respondents for whom to fit a regression estimate due to their very high persistence rate (96%) and the homogeneity of the Residential College student population in race, gender, and ability. Nevertheless, a significant model was estimated (the likelihood ratio chi-square tests of the overall model and the policy block were significant at the $p < .1$ level). The model explains a smaller amount of retention behavior than those of the other schools; the Nagelkerke R^2 was .198. The model still accurately predicted 80 percent of nonpersisters and 72 percent of persisters, however. The high “hit rate” for nonretained students demonstrates a good level of utility for the college. This significant contribution is likely attributable to the higher percentage of the population that the 262 respondents represent: 46 percent of the total first-year population. The full results of the regression can be found in Table 7, below.

The regression equation also had fewer significant items than the other models. Only family encouragement ($\text{Exp}(\beta) = 2.49, p < .05$) was associated with higher persistence. Turning in assignments late ($\text{Exp}(\beta) = .48, p < .1$) was significantly related to student nonpersistence. Despite the challenges associated with a high-achieving, homogenous population this study was able to provide a model that could assist the college to better understand some of the issues surrounding retention of first-year students. Even in this environment, family encouragement

was quite important to student success. Late assignments as a predictor may indicate a type of early warning system for students who are considering leaving. Perhaps these students have already begun withdrawing from academic responsibilities before actually leaving the institution.

Variables	Odds Ratio	Sig.
Certainty of funding	1.58	
First-year experience	0.44	
Academic support ^F	1.59	
Family encouragement	2.94	**
Late assignments	0.48	*
Transition support	0.51	
Connection with campus	2.09	
Class absences	0.68	
% correctly predicted: Persisters		80
% correctly predicted: Nonpersisters		72.2
Nagelkerke		0.198
*p<.10, **p<.05, ***p<.01, ****p<.001		
^F represents a factor		
n=262		

Discussion and Implications

There are lessons to be learned from this pilot study both in terms of specific practices associated with retention at particular institutions and in the methods associated with studying persistence. This makes the study useful both to practitioners on campuses working to improve their institution’s retention rate as well as higher education researchers attempting to learn more about the factors associated with students’ decisions to stay enrolled. Additionally, the study indicates several important avenues for future research.

Lessons for Institutions

The significant role of family encouragement in retention was one of this study's most interesting findings. While the exact meaning of family encouragement bears further exploration within both individual and institutional contexts, there are clear policy implications for institutions of higher education wishing to improve this type of external support for students. One productive institutional strategy would be to help student families understand school policies and processes as well as the resources available and the experiences that their family member may have while enrolled. Schools already conducting some sort of family orientation could measure its quality and impact on the students' perceptions of family support.

At two of the campuses in our study, satisfaction with support during transition and perception of bias were significant. Both of these provide interesting implications for campuses. Transition support is noteworthy not only for its significance but also for the fact that neither of the factors stemming from programmatic structures often associated with transition—first-year experience programs and orientation—were significant in the estimated regressions. This likely points to the fact that students find support for their adjustment to college from a number of sources, not just the traditional ones. It would be worthwhile to explore further the types of experiences that students find helpful in their transitions.

The discovery of a positive relationship between students' experiences with bias and students' persistence, discussed briefly above, seems counterintuitive at first glance. After all, an environment free of racism, sexism, or homophobia would seem more ideal for learning. Researchers including Sedlacek (2004), however, have found that accurately identifying and coping with discrimination is important developmental skill for students' success in college. When viewed in this light, a keener awareness of discrimination or bias is an important

developmental tool for success in college. Those who have this tool, and who acquire it earlier, may have an advantage in terms of persistence.

It is important to note here that finding a particular programmatic variable nonsignificant does not mean that the program is unimportant or that it does not contribute to student success at the institution. A lack of variation or other form of restricted range in the variable's distribution would greatly reduce its ability to predict retention. If a great proportion of students all reported positive relationships with advisors, for example, advising would not show up as an important variable in the equation—despite its very desirable outcome.

Finally, rather than simply applying a global or generic model of retention, schools should take away from this research the need to understand retention within their individual institutional context. Each school needs to explore how students respond to and are served by specific policies within the framework of the school's educational mission, student body, and unique needs—particularly at special mission institutions or those serving homogeneous student bodies. This is an important lesson for researchers as well.

Implications for Research

In addition to indicating a need for further research on generic as well as institution-specific models for retention, this study offers other useful contributions to the research on persistence in higher education. The first of these is the use of factors or indices. In this study, the factors held together in very similar ways across institutional contexts, indicating that carefully constructed questions can lead to a reliable form of data reduction as well as a more nuanced understanding of student interaction with particular policy levers. While few of these factors were significant predictors of student persistence, many factors—although

nonsignificant—were important contributors to the discriminating power of the model. Often, it was their presence in the model that allowed the overall equation to correctly categorize a larger portion of nonpersisters. Further exploration into the construction and use of these factors is certainly warranted.

Concluding Remarks

Reflecting on the results of this pilot study, we are encouraged to pursue this line of inquiry further. The ability to model student persistence situated within an institutional context, and to identify policies and programs that are likely to enhance persistence within that context are two important contributions to the capabilities of institutions to support students' success. This study's findings and their implications for policy and programs suggest that these capabilities are not only attainable but that they also hold the potential for improving student persistence at the participating institutions. While it is important to remember the complexities that accompany efforts to support student persistence and thus not to interpret results simplistically, the findings highlighted here provide an empirical basis and identify promising directions for institutions' efforts to enhance student persistence.

Appendix

Tables of Descriptive Statistics for the Three Institutions

Table A1. Coastal University Descriptive Statistics					
Variable	Obs	Mean	Standard Deviation	Minimum	Maximum
Enrolled fall 2007	350	0.91	0.28	0	1
Female	350	1.61	0.49	1	2
White	345	0.61	0.49	0	1
Combined SAT score (in 100s)	337	10.75	1.08	7.6	13.8
Certainty of funding	350	3.15	0.95	1	4
Orientation ^F	350	-0.01	0.8	-2.45	1.63
Advisor interaction ^F	313	0.00	0.96	-1.08	3.66
Perception of bias ^F	350	0.01	0.9	-0.94	3.11
Faculty interaction ^F	344	0.004	0.89	-2.28	1.65
Student interaction ^F	348	0.001	0.87	-2.95	1.29
Perception of diversity ^F	350	-0.11	0.89	-2.56	1.15
Financial aid ^F	348	-0.01	0.93	-1.75	1.61
Family encouragement	349	3.74	0.54	1	4
Transition support	350	3.09	0.81	1	4
Friends network	349	3.5	0.81	1	4
Late assignments	343	1.67	0.76	1	5
Staff respect for students	349	3.28	0.58	1	4
<i>Note:</i> ^F represents a factor					

Table A2. Urban University Descriptive Statistics					
Variable	Obs	Mean	Standard Deviation	Minimum	Maximum
Enrolled fall 2007	184	0.88	0.33	0	1
Female	181	1.61	0.5	1	3
Age	181	0.81	0.4	0	1
Perception of bias ^F	181	0.02	0.94	-0.56	5.65
Academic support ^F	177	-0.01	0.78	-1.35	2.54
Work off campus	184	2.38	1.55	1	6
Transition support	184	3.03	0.86	1	4
Friends network	184	3.11	0.97	1	4
Connection with campus	183	2.91	0.9	1	4
Family encouragement	184	3.63	0.64	1	4
Class absences	184	2.45	1.06	1	5
<i>Note:</i> ^F represents a factor					

Variable	Obs	Mean	Standard Deviation	Minimum	Maximum
Enrolled fall 2007	285	0.96	0.18	0	1
Certainty of funding	323	2.46	1.11	1	4
First-year experience ^F	324	-0.003	0.92	-3.9	0.97
Academic support ^F	306	0.006	0.83	-1.42	2.94
Family encouragement	322	3.64	0.66	1	4
Late assignments	317	1.89	0.77	1	5
Work off campus	324	1.33	0.96	1	6
Transition support	324	3.28	0.76	1	4
Connection with campus	324	3.46	0.68	1	4

Note: ^F represents a factor

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