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FEATURES

Economic Affirmative Action and Race-blind Policies

Steven P. Chatman, Ph.D. & Kandis M. Smith, Ph.D.

The Perceptions of College and University Enrollment Managers on the Relationship Between Institutional Enrollment Performance and Enrollment Management Effectiveness

Clayton A. Smith, Ed.D.

Transfer Students' Institutional Attendance Patterns: A Case Study

Barbara K. Townsend

Enrollment Management as a Portfolio Investment Problem

Robert E. Martin

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Resources

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Editor's Note

A cookie caused Proust to remember things past. In my case it was a Timetable of Classes and a cool day that reminded me that the first semester was in the offing. As I leafed through the Timetable my thoughts ran to days past and how good things seem to have been back then. Well, at least relatively good! First off, even the revered term "semester" appears to be passe. Years ago we had two semesters and one summer session; now everything seems to be in multiple "modules" with start and finish times all over the calendar which run all year and even overlap. No time for a breather! Mon Dieu! The once untouchable three diploma dates are being replaced with, it seems, daily

diploma dates as employers and licensing agencies breathe down Registrars' necks. And, I further pondered, why are proposals always "academically sound" but those of administrators looked at askance? There was more such, much more—I'll bet you can fill in. But then I connected again with reality as I watched computer-generated transcripts being produced and noted that I was using a PC to type rather than a manual typewriter. And another thought came to me: Perhaps nostalgia isn't what it used to be! What do you think?

Roman S. Gawkoski

Instructions to Authors

The *C&U* Editorial Board welcomes manuscripts for publication in *College & University*, AACRAO's scholarly research journal. AACRAO members are especially encouraged to submit articles pertaining to their own experiences with emerging issues or innovative practices within the profession.

The Board also welcomes comments on articles, timely issues in higher education, and other topics of interest to this journal's readers in the form of letters to the editor or longer guest commentary. We especially invite AACRAO members to participate in reviewing books.

Manuscript Preparation

Manuscripts for feature articles should be no longer than 4,500 words. Manuscripts for guest commentary and book reviews should not exceed 2,000 words. Letters to the editor will ordinarily be limited to 200 words.

All submissions must be saved to an IBM-compatible disk (Microsoft Word, preferably) and include a hard-copy original printed on 8.5" x 11" white paper. Because the Board has a blind review policy, the author's name should not appear on any text page. A cover sheet should include the title of the manuscript, author's name, address, phone and fax number, and e-mail address.

References should be formatted in the author-date style and follow guidelines provided on page 526 of *The Chicago Manual of Style*, 14th edition. A list of references should appear at the end of the article. Text citations also follow the author-date format; examples may be found on page 641 of the Manual. For more information or for samples, please contact the *C&U* Editor.

Essential tables and charts should be included on separate pages at the end of the manuscript. All graphics should be submitted on clean, reproducible, or camera-ready paper.

All submissions are accepted for publication with the understanding that the *College & University* editors reserve the right to edit for clarity and style. Please do not submit articles that are under consideration for publication by another periodical.

Authors whose manuscripts are selected for publication will be asked to submit a short biographical statement and an abstract of their article, each no more than thirty-five words.

Submit manuscripts, letters, and direct inquiries to—

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Editorial Procedure

The editor will acknowledge receipt of manuscripts (letters will not be acknowledged) and will forward them to members of the *C&U* Editorial Board for review. The Board will consider the appropriateness of the article for AACRAO's membership, the current needs of the professions, the usefulness of the information, the nature and logic of the research methodology, clarity, and the style of presentation.

This review may take as long as three months, after which the *C&U* editor will inform the author of the manuscript's acceptance or rejection.

Economic Affirmative Action and Race-blind Policies

This article uses a variety of data sources to examine the extent to which economic disadvantage explains race bias in admissions and college attendance patterns, then addresses the possibility of reaching racial diversity through economically-based affirmative action. The first section presents evidence to support reconsidering the validity of admissions measures. Some admissions measures will be shown to exhibit racial bias and race-blind policies do not mean that racially biased measures can be used to determine college admission. The underlying cause of bias will be shown to be economic disadvantage. Second, in spite of phenomenal growth in financial aid programs, statewide attendance patterns will show that financial barriers to attendance exist even among public colleges. Students do not necessarily attend the most selective school that would accept them and their attendance suggests that economic resources play heavily in the decision. The third section reports the results of attempts to produce racial diversity by adjustments to offset students' social and economic circumstances. The technique produced a more racially diverse student body than would be the case using economically neutral race-blind policies.

The development, evolution, and current status of racial affirmative action programs will not be reviewed for two reasons. First, there are several excellent reviews available (Heffernan and Bazluke 1996; Preer 1981; Friedl 1999). Second, racial affirmative action policies have been fairly ineffective. After more than 20 years of affirmative action, minority graduates have declined as a percentage of the minority population in general (Astone and Nunez-Wormack 1990). From 1976 to 1988 the number of 18- to 24-year-old African-Americans increased by nearly 8 percent; the proportion going to college decreased by about 5 percent. So while the number attending college increased over this period, the number not attending increased even more (Astone and Nunez-Wormack 1990).

Why has affirmative action been ineffective? One reason may be that it became myopically focused on superficial student

characteristics and forgot that its original mission was to help people overcome the economic circumstances that were the legacy of racial discrimination and legal segregation. It was the consequence of these circumstances that affirmative action was to offset, but evaluating success became a strictly enumerative determination of racial composition. Maybe affirmative action would be attacked with less zeal if it focused on economic disadvantage and worked to alleviate barriers to attendance faced by all poor students, whether minority or not (Fuller and McNamara 1978).

Would an economically-based affirmative action policy yield a racially diverse campus? Alexander Astin (1978) struggled with the question over two decades ago. Astin tried to create admissions policies that would yield the proportional racial distributions then required by law without directly considering race. His effort was founded on the principle that public support for special minority programs was largely support for helping people overcome the social, economic, and educational handicaps of discrimination. He noted that public resistance increased as special policies emphasized race rather than social and economic disadvantage. Using a disadvantage index computed from the sum of standardized scores on parental education and income, Astin compared the minority composition of eight alternative admissions strategies. Those strategies varied by selection-ratio used, measures included, and weights assigned. When applied to the applicant pool, models that

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incorporated test scores, either singularly or in combination with other measures, produced the least representative freshman class. Class grades were less of a problem and a strategy that equally weighted grades and disadvantage yielded nearly proportional representation. In sum, Astin was able to produce accepted applicant groups of nearly any racial composition by varying the admissions measures and weights assigned. Unfortunately, substantial weight was required to overcome academic admission measures.

Applying Astin's research to a selective public university illustrates the challenge that might be faced if race could not be a factor in admissions. Using the Astin 1978 findings for a selective public institution (about one-in-four accepted), would suggest that university policies would have to equally weight disadvantage and grades or weight disadvantage twice the amount of grades and test scores to produce a situation where about one-in-four African-American students was selected. According to *The Chronicle of Higher Education* (February 27, 1998), Michigan's policy at that time weighted academic factors nearly four times as much as non-academic factors. Using Astin as a guide, the University of Michigan's combination would not be expected to achieve the University's diversity goals unless admissions counselors continued to apply judgment and use the flexibility inherent in the admissions grid to achieve diversity.

Section 1: Admissions Measures and Predictive Bias

Before attempting to create diversity through social and economic affirmative action, a better understanding of the interaction of admissions measures; student performance; and economic, social, and geographic factors will be useful. After all, any admissions system is a method of limiting access to higher education and as such should pass muster regarding fundamental questions of validity. Are the measures employed useful predictors of academic performance and is their usefulness equal for all applicants? The issue is statistical prediction and it can be measured by linear regression or correlational techniques (Linn 1984).

The admissions measures most frequently attacked as racial-ly and culturally biased are admission test scores, but arguments are also made opposing the use of academic outcome variables like high school class rank or high school GPA. Therefore, three measures: ACT, high school percentile rank in graduating class, and high school grade point average will be correlated with the grade point average in the first semester to determine predictive validity.

There is an argument ignored by this type of analysis. That argument states that required admissions measures are cultural-ly biased and only function well when predicting performance in college because the college experience is similarly biased. A measure that is equally and strongly correlated with postsec-ondary performance for both African-American and white stu-dents is not free of this criticism. The possibility raised by this argument is recognized but is beyond the scope of this paper.

Much of the research presented in this paper was based on comprehensive statewide databases. However, those databases did not include the postsecondary academic performance infor-mation necessary to address whether predictive validity varied by social or economic groupings. Instead of statewide databas-es, University of Missouri data for the four-campus system will serve as the research database for the validity questions.

The predictive measures used were ACT, percentile rank in high school graduating class, and high school GPA in core area courses (English, math, science, social studies, foreign language, and visual or performing arts). Demographic variables consid-ered included race (African-American or other), high school student body wealth (quartile based on percentage of students qualifying for free- or reduced-price lunches), parental adjust-ed-gross-income quartiles (from FAFSA submissions), and parents' level of education (neither had college degree, one had college degree, or both had college degree). The dependent measure of academic performance was fall grade point average for degree-seeking, full-time freshmen who were recent gradu-ates of Missouri high schools. Throughout the paper, African-American students will be the only disadvantaged minority iden-tified because, proportionally, Missouri has too few American Indians or Hispanic students to support separate analysis.

The following observations pertain to Table 1 and associated figures. The top half of Table 1 displays simple correlations of ACT, class rank, and high school GPA with freshman GPA by parental income, parental educational level, and high school student body wealth. The correlations were computed separate-ly for African-American students and all other students and the absolute value of the difference between these two groups is shown. The number of observations in the correlation is also shown. The bottom half of Table 1 reports mean values, the intercept, regression coefficient, and variance explained of sim-ple regression models. Selected values of each variable are then used in the regression equations to produce predicted grade point averages based on the equation for African-American stu-dents, other students, and the difference between predicted val-ues resulting from the two equations. This difference is labeled "advantage" but negative values represent disadvantage.

The term "advantage" was selected based on prior research. Of the several reviews of research available, all were in agree-ment that there were few cases of predictive bias and where dif-ferential predictive-bias was found, the use of a common regres-sion equation resulted in over-prediction of African-American performance (Breland 1978; Cole 1981; Hargadon 1981; Linn 1984). Statistically, systematic over-prediction would tend to result in higher standards being required of African-American students for a given grade point average, a politically and ethi-cally unimaginable situation. But the over-prediction observa-tion does not explain the subtleties of the interrelationships. While generally supporting the conclusion of over-prediction, the following discussion will show that the situation may be very complex. The following section will address the funda-mental question of predictive validity and suggest how any observed differences might influence admission policies.

ACT

ACT's predictive validity has been shown to be remarkably unassociated with demographic variables in past studies at the University of Missouri. While not as strongly correlated with freshman grade point average as high school performance measures, it has been very consistent. In this study, its overall correlation with freshman GPA was 0.39 (n=4,488). For African-Americans it was 0.36 (n=301) and it was 0.39 (n=4,187) for all others. Not only were these correlations similar, the correlations across parental education, income, and high school wealth were generally of similar strength. However, there were a few exceptions. For African-American students in the 2nd quartile of high school wealth, the correlation was not significant at a 0.05 level. The correlation was also not significant

for first-generation African-American students. In these cases, and for African-American students whose parents earned \$44K to \$66K, the sample sizes were fairly small and except for first-generation students, probably of little importance. The correlations for other students display little variation across social and economic groupings.

Simple regression lines showing the predicted relationship between ACT and freshman grade point average are shown in Figure 1 on the following page. Relying on the figures or the appropriate values of Table 1, it is obvious that the two lines are remarkably similar and are essentially interchangeable for African-American or other students. The ACT generally behaves as desired. It is a valid predictor that works reasonably well across many student groups.

Table 1A: Correlations Among Admissions Measures (University of Missouri Freshmen in Fall, 1997)

Variable Levels	ACT					High School Class Rank					High School GPA					
	African-American		All Others		Abs. Val.	African-American		All Others		Abs. Val.	African-American		All Others		Abs. Val.	
	R	n	R	n	Diff.	R	n	R	n	Diff.	R	n	R	n	Diff.	
Parental Adj. Gross Income																
Parental AGI > \$66K	0.35	41	0.44	807	0.09	-0.03	39	0.49	778	0.51	0.23	39	0.51	710	0.28	
Parental AGI \$44-\$66K	0.32	25	0.39	566	0.07	0.41	24	0.43	552	0.02	0.42	24	0.45	481	0.03	
Parental AGI \$25-\$44K	0.39	38	0.32	446	0.06	0.15	39	0.40	438	0.24	0.36	38	0.44	367	0.08	
Parental AGI < \$25K	0.35	43	0.38	309	0.03	0.22	43	0.46	306	0.24	0.34	41	0.52	263	0.18	
Parental Education Level (with College Degree)																
Both parents	0.50	48	0.38	933	0.11	0.09	47	0.45	901	0.37	0.33	45	0.48	818	0.15	
Only one parent	0.37	59	0.39	645	0.02	0.02	58	0.45	629	0.42	0.29	57	0.48	548	0.19	
Neither parent	0.12	60	0.37	574	0.24	0.44	60	0.45	567	0.01	0.47	57	0.51	471	0.04	
High School Student Body Wealth																
Wealthiest Quartile	0.47	42	0.41	993	0.06	0.51	42	0.53	995	0.02	0.62	40	0.55	874	0.07	
Wealthier Quartile	0.28	59	0.38	935	0.10	0.40	59	0.49	938	0.10	0.47	55	0.51	850	0.04	
Poorer Quartile	0.21	33	0.43	646	0.22	0.34	33	0.47	646	0.14	0.24	30	0.55	537	0.31	
Poorest Quartile	0.32	53	0.39	300	0.07	0.22	54	0.39	299	0.17	0.36	53	0.42	247	0.06	
Total	0.36	301	0.39	4,187	0.03	0.28	296	0.47	4,127	0.19	0.39	293	0.49	3,646	0.09	

Table 1B: Simple Regression Equations

	Mean	a	b	r ²	Predicted African-American Freshman GPA at Selected Score Levels														
					Using African-American Regression					Using "Other" Regression					Advantage to A-As Using "Other"				
					19	21	23	25	27	19	21	23	25	27	19	21	23	25	27
ACT																			
African-Americans	23	1.34	0.06	0.13	2.57	2.70	2.82	2.95	3.08	2.53	2.67	2.80	2.94	3.08	-0.04	-0.03	-0.02	-0.01	-0.01
All Others	26	1.23	0.07	0.15															
High School Percentile Class Rank					50	60	70	80	90	50	60	70	80	90	50	60	70	80	90
African-Americans	73	2.22	0.01	0.08	2.62	2.70	2.78	2.86	2.94	2.47	2.65	2.84	3.02	3.21	-0.15	-0.05	0.06	0.16	0.27
All Others	81	1.55	0.02	0.22															
High School GPA					2.50	2.75	3.00	3.25	3.50	2.50	2.75	3.00	3.25	3.50	2.50	2.75	3.00	3.25	3.50
African-Americans	3.02	1.22	0.52	0.15	2.51	2.64	2.77	2.90	3.03	2.41	2.59	2.77	2.96	3.14	-0.10	-0.05	0.00	0.05	0.11
All Others	3.33	0.59	0.73	0.24															
					Score Required for Selected Freshman GPAs (Predicted)														
				Fr GPA	2.25	2.50	2.75	3.00	3.25	2.25	2.50	2.75	3.00	3.25	2.25	2.50	2.75	3.00	3.25
				ACT	14	18	22	26	30	15	19	22	26	30	-1	-1	0	0	0
				High School Rank	4	35	66	97	128	38	52	65	79	92	-34	-16	1	18	36
				High School GPA	1.99	2.48	2.96	3.44	3.92	2.28	2.62	2.97	3.31	3.65	-0.29	-0.15	-0.01	0.13	0.27

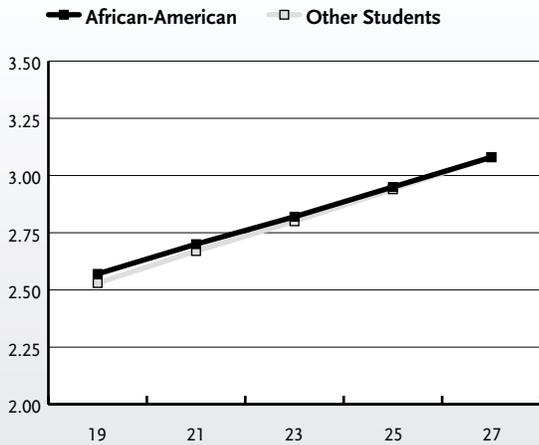


FIGURE 1: PREDICTED GPA BY ACT

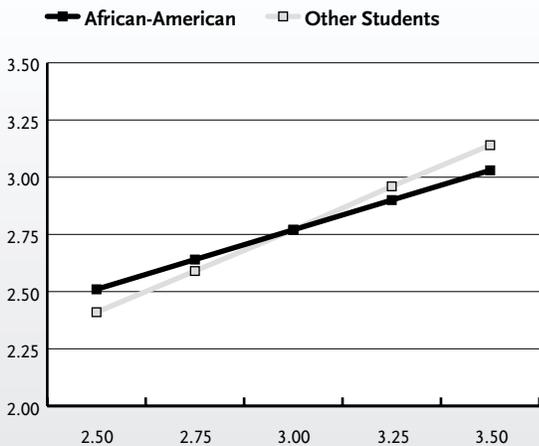


FIGURE 2: PREDICTED GPA FROM HIGH SCHOOL CORE GPA

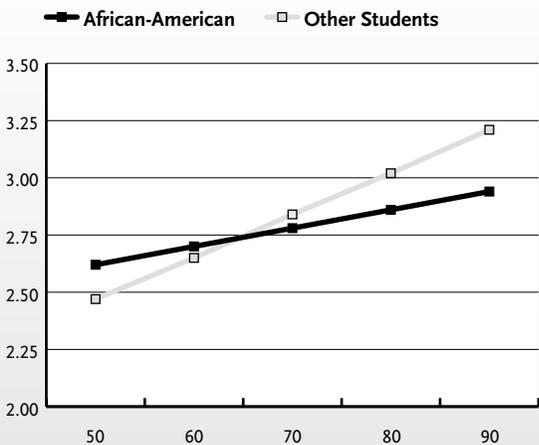


FIGURE 3: PREDICTED GPA BY HIGH SCHOOL CLASS PERCENTILE RANK

HIGH SCHOOL GRADE POINT AVERAGE

High school grade point average in core area courses was generally a better predictor of freshman performance than was ACT. The correlation was 0.49 for all students ($n=3,939$) as compared to 0.39 for ACT. In addition, a similar level of association was true across income, educational, and high school characteristics and the exceptions that occurred were not monotonically associated with variable level. For example, high school GPA was somewhat less strongly correlated with freshman GPA for students whose parents earned somewhere between \$25K and \$66K but the correlations were higher at both extremes. It should be noted that the pattern for African-American students was generally weaker than for other students. That is, there was a lower correlation and a slightly flattened regression line.

In spite of the small difference, the two regression lines are obviously very similar and predicted grade point averages differed by no more than about 0.10 across the range of typical values. (See Figure 2.) In sum, high school grade point average was generally a better predictor of freshman performance than ACT and its predictive ability was little affected across social and economic groupings for most students and in most cases. It was much less clear that high school grade point average worked as well for African-American students. The numbers were unfortunately small, so the possibilities suggested will have to be pursued at another point. In any event, the regression lines were close throughout the range of most high school grade point averages, so separate equations were not justified even though the variance explained by the African-American regression was nearly 10 percent less than that for other students. Even at 24 percent of variance explained for African-American students, high school grade-point-average was well above the 13 percent variance explained by the less economically affected ACT.

PERCENTILE RANK IN HIGH SCHOOL GRADUATING CLASS

High school class rank does not predict freshman performance as well for African-American students as for other students. The simple correlations differed by 0.19 and variance explained differed by 14 percent. The pattern across variable levels was not consistent and the frequency of very low correlations was cause for concern. When this analysis was compared to that of an earlier University of Missouri study based on a larger student population of over 10,000 students, campus-level analyses were possible. These campus-level results showed that high school student body wealth was an important factor in explaining the weaker correlation for African-American students. The explanation offered was that high school rank was a less useful predictor for students from poorer high schools and African-American students were over-represented in poorer high schools (Chatman 1992 and 1996). The regression equation and resulting second figure illustrate that the differences were fairly pronounced (difference of 0.15 GPA or greater) for percentile ranks of about 50 or less or at about a percentile rank of 80 and above and that these were fairly common levels of class rank.

Subtlety of interpretation for an observation of systematic over-prediction was mentioned earlier and will be described

here using the relationship between class rank and freshman GPA. (See Figure 3.) At most levels of class rank common for university students, use of a common regression equation would tend to over-predict the performance of African-American students. The majority of observations occur above a percentile rank of 65 where the two lines intersect. For any class rank above the intersection, an African-American student's performance would be predicted to be higher using the line for other students although either line would yield similar predicted values throughout the range from about a percentile rank of 50 to a percentile rank of 80. The regression lines differed because the correlation was much less for African-American students and if separate admissions policies were created based on a predicted GPA, 2.5 for example, the policies would differ greatly. The class percentile rank predicting a 2.5 for other students (not African-American students) was 52, while for African-American students, it was a percentile rank of 35. For ranks below the intersection, separate policies would make access easier for African-American students. Above the point of intersection, the reverse would be true. If the admission policy were a predicted GPA of 3.0, and separate equations were used, then the required class percentile rank for African-American students would be 97, and for other students, 79. Fewer African-American students would qualify for grade point averages above the intersection. So while systematic over-prediction was found which would systematically advantage African-American students, over-prediction was limited to the range above the intersection of separate regression lines. All things considered, high school percentile rank was a valid predictor but functioned less well for African-American students.

SUMMARY OF PREDICTIVE VALIDITY

Before states move to race-neutral policies, it would be to their advantage to assess again the validity of those measures that would form the race-blind policies. If those measures do not function equally well for students of different races or of different economic or social circumstances, then their blind use is questionable. The admission test, ACT, was a valid predictor that worked reasonably well across many demographic groupings. High school grade point average was a better predictor of freshman performance than ACT and its predictive ability was also generally consistent across demographic groupings. The somewhat lower validity for African-American students will require larger sample sizes to resolve whether or not the difference is of practical importance. In contrast to ACT and high school grade point average, high school class rank did not predict performance as well for African-American students. The explanation offered was that validity varied with high school wealth and African-American students were over-represented in poorer high schools. In general, the results here support those of Breland (1978) who noted that high school GPA and high school class rank had less differential impact in admissions than did regression-based models including test scores. Unfortunately, Breland did not report how well these measures predicted performance.

Section 2: Evidence of Economic Barriers to Access

The second section of this article tries to determine whether attendance patterns provide evidence of disparate impact by economic status. If an economically-based affirmative action program is to be considered, then there should be evidence that economic barriers to attendance exist. The analyses of this section were made possible by the support of the Missouri Coordinating Board and Department of Higher Education that is in the process of reviewing its admission guidelines established in 1992. The data sources shared for this project were student-level enrollment and performance (EMSAS), federal financial aid applications (FAFSA), and test score records (ACT). These records made possible an examination of the interrelationship of economic circumstance and attendance among public institutions that vary in program offerings (two- or four-year), cost, location, and selectivity of admissions requirements.

EMSAS records included all first-time freshmen enrolled at Missouri's public postsecondary institutions in the fall of 1997. Both FAFSA and ACT records included most of these students and many others. Ideally, the relationship between ACT, FAFSA and EMSAS records might help locate students with an interest in higher education who did not enroll, but the inability to control out-of-state, private, or proprietary institution enrollment forced restriction to the 24,933 EMSAS records. Any records from ACT or FAFSA that could not be merged with EMSAS records were excluded. Secondly, because the study focused on patterns for the state of Missouri, students from high schools outside the state were excluded. This resulted in a core set of 20,570 first-time freshmen. Of these 20,570 first-year students, 9,516 had FAFSA records and 16,875 had ACT records.

Because this study relied on records from a variety of partial sources, the first analyses were directed toward the question of whether FAFSA and ACT records could be treated as approximate samples of EMSAS records and as samples of each other. EMSAS, FAFSA, and ACT records were compared on five dimensions: sex, race/ethnicity, college core of high school courses, wealth of the public high school attended, and parental gross income. The results of these comparisons showed that the sources were very similar for all variables (Chatman and Smith 1998).

There were small differences between FAFSA and ACT records of parental income, and even these small differences might readily be explained as reflecting inaccuracy of student knowledge of parents' income. FAFSA records were slightly more likely to be of females than the other two sources but that difference was 3 percent or less. Distribution by race/ethnicity was also very similar among the three sources. The largest differences were found when comparing the likelihood of completing core requirements in high school. Using transcript records reported by the institutions or from ACT when EMSAS records were not available showed that students with FAFSA records were somewhat more likely to have completed the required core (85 percent v. 80 percent) but the differences were small. The last variable used to compare students from the three data sources was wealth of the high school attended. Wealth of high school was defined according to the student

body, specifically, according to the proportion of students attending the high school who qualified for free- or reduced-price lunches. All public high schools were sorted into quartiles of equal numbers of total enrolled students. The distributions were again very similar across the three sources. In sum, FAFSA students, ACT students, and EMSAS students were similarly distributed along demographic and economic dimensions and can be considered equivalent samples of the same population (Chatman and Smith 1998).

Students attending four-year institutions were more likely to complete FAFSA forms and students attending more expensive four-year institutions were more likely to submit forms than were students attending less expensive institutions. The relationship between the proportion submitting applications and cost did not hold for two-year schools. Among two-year schools, the proportion submitting FAFSA forms varied widely from 60 percent at West Plains to 21 percent at the Jefferson and Longview campuses of the Kansas City Metropolitan Community Colleges (Chatman and Smith 1998). This variation was a reminder that regions of Missouri are not equally prosperous. The districts served by two-year institutions may be poor, as was true of the rural southeast and north-central areas, or relatively wealthy as was true of Kansas City and St. Louis suburban areas. These differences will be made more clear subsequently. At this time, the more important point is that FAFSA records will not equally represent two- and four-year institutions. That is not to say that the students attending these institutions necessarily differ in economic status, but they might. It may well be the case that application is more a function of cost and students planning to attend less expensive two-year schools were less likely to see the need to submit a FAFSA than if they had planned to attend a four-year school.

SELECTIVITY

The 13 public four-year institutions were then sorted into four tiers based on selectivity. Missouri public four-year institutions require students to submit high school rank and test scores and admission is generally based on the combination of high school percentile rank in class and national norm test score percentile (ACT's 1991 high school graduating class norms were used here). Some students submit SAT scores but the number is relatively small and these were converted to equivalent ACT scores. The use of combined percentiles reflects a statewide effort to create four levels of admission selectivity: *highly selective*, *selective*, *moderately selective*, and *open enrollment*. While each institution has identified a selectivity category, for many institutions, the category standards tend to function more as a goal than as

absolute standards. Because schools vary in practice from the selectivity category standards, a different method was used to sort them into tiers. For the purposes of this study, the schools were sorted according to the 10th percentile of the combined percentile distribution. The assumption was that any student with a combined percentile rank at or above 10 for that institution's admitted students would likely be admitted. It is a form of *de facto* as opposed to published minimum admission requirements. The application of the four tiers will be shown later in the paper where the impact of disadvantage adjustment on student distributions is measured.

As noted in Table 2, the most selective tier includes a public liberal arts institution, Truman State, and UM-Rolla, a campus of the University of Missouri that is composed largely of engineering students. Two of the remaining three campuses of the University were second tier. The third tier was primarily regional four-year institutions with master's programs. The last tier was four-year public colleges, an 1890 Land Grant institution and an urban institution with a largely African-American student body studying to complete education degrees. Overall, selectivity correlated with cost and with likelihood of FAFSA submission (Chatman and Smith 1998).

FIRST-GENERATION

Statewide, 40 percent of students were first-generation — neither of their parents had graduated college. Of the remaining 60 percent, about half had one parent with a college degree and half had two parents with college degrees. Parental education

Table 2: Median Values for Four-Year Public Institutions (Missouri Freshmen)

Campus	Parents' Adj. Gross Income		ACT		Percentile Rank (High School Graduating Class)		Sum of Percentiles		Distance (miles)	
	Median	n	Median	n	Median	n	Median	n	Median	n
UM-Rolla	48,365	327	29	474	88	457	180	453	95	398
Truman State	56,890	697	27	1,184	88	1,183	170	1,182	158	875
UM-Columbia	53,500	1,669	25	2,782	82	2,726	164	2,717	115	2,342
UM-Kansas City	63,678	233	25	428	83	408	162	407	26	365
SMSU	45,103	1,260	23	2,320	74	2,287	141	2,285	114	2,083
CMSU	45,957	639	22	1,169	72	1,150	132	1,149	56	1,062
SEMO	44,671	468	22	908	69	897	132	896	43	782
UM-St Louis	44,596	304	22	581	67	552	131	548	0	398
NWMSU	41,132	446	21	806	70	797	130	796	86	757
Southern	33,544	209	21	505	64	470	123	470	22	495
Western	39,621	399	20	815	64	758	109	742	24	776
Harris-Stowe	24,534	47	17	117	62	126	86	112	0	102
Lincoln	38,114	105	18	243	46	223	84	216	25	195
Both Parents w/ College Degrees	58,322	2,231	25	2,271	81	2,206	160	2,201	110	1,861
At Least One w/ College Degree	47,082	2,056	24	2,123	78	2,081	152	2,076	95	1,809
No Parent w/ College Degree	38,852	2,422	23	2,610	78	2,572	145	2,563	81	2,324
> \$66K (Parent Adjusted Income)	79,265	1,944	25	1,943	79	1,885	159	1,883	115	1,494
\$44-\$66K (Parent Adjusted Income)	53,083	1,792	24	1,791	81	1,760	156	1,760	92	1,530
\$25-\$44K (Parent Adjusted Income)	35,364	1,612	23	1,609	79	1,581	152	1,575	81	1,431
< \$25K (Parent Adjusted Income)	17,045	1,455	23	1,452	76	1,426	141	1,420	84	1,332

followed the same trend as did FAFSA application and selectivity. Generally, first-generation students were more likely to enroll at two-year institutions and were more likely to enroll at the less selective four-year institutions. In contrast, it was unusual for children of college educated parents to attend less selective four-year public colleges or community colleges (Chatman and Smith 1998).

HIGH SCHOOL CORE

The observed trend of selectivity correlating with cost, FAFSA application, and parental education continued with respect to proportion completing college preparatory high school core. Statewide, 80 percent of freshmen completed a college-preparatory core in high school as did 92 percent of those attending four-year institutions (Chatman and Smith 1998). Noting that these proportions were limited to those with data available either as transcript records from EMSAS or self-reported data from ACT, the proportions were striking. Completion of a high school preparatory core was clearly positively associated with four-year school selectivity and negatively with two-year school enrollment. One characteristic of core that makes analysis more interesting is that core is the result of behavior, not demographic happenstance. Students do not pick their parents or their economic circumstances, but they can pick their high school courses.

HIGH SCHOOL STUDENT BODY WEALTH

The pattern of wealth of high school student body shows less correlation with the general economic trend. The pattern more closely reflected reliance on service region and variation among service regions. For example, 81 percent of the students attending St. Charles Community College were from high schools in the wealthiest quartile while only 1 percent of those attending North Central were from wealthy high schools (Chatman and Smith 1998). This difference was obviously the result of different local economic conditions in rural north central Missouri and suburban St. Louis. That noted, students attending more selective and expensive four-year institutions were generally less likely to have attended high schools with a relatively large number of poorer students.

PARENTAL ADJUSTED GROSS INCOME

To further examine the relationship of financial resources to college attended, four groupings of equal number of students were generated based on their parent's reported income. Therefore, a distribution of 25 percent in each quarter was forced upon the data by using breakpoints at about \$25K, \$44K, and \$66K (Chatman and Smith 1998). Generally, students from less wealthy homes were more likely to enroll at two-year institutions and at less selective four-year institutions. With few exceptions owing to suburban location, there were relatively few wealthy students attending two-year community colleges or less selective four-year colleges. In contrast, there were relatively few students from the least wealthy group attending schools in the two top tiers. Together with the examination of the distribution by high school student body wealth, it would appear that the

wealthier students from the poorer schools were increasingly likely to enroll in more selective four-year universities.

SEX

Sex of students shows nothing unexpected. Generally, more women than men go to college and deviations from that observation are explained by disciplinary patterns. Fewer women than men enroll in engineering which limits their number at UM-Rolla and fewer men than women enroll in education programs which limits their number at Harris-Stowe (Chatman and Smith 1998).

AFRICAN-AMERICANS

The next analysis was of the proportion of African-American students attending each institution. African-American students were the only minority group identified for this paper as Missouri has relatively few Hispanic or Native American citizens and thus enrolls very few Hispanic or Native American students in higher education. Overall, about 8 percent of freshman students attending public postsecondary institutions in Missouri are African-American and the proportions vary greatly by institution and location. Lincoln University is an 1890 Land Grant school and is about 32 percent African-American. Harris-Stowe is a historically African-American school in St. Louis and Penn Valley, Forest Park, and Florrisant Valley are geographically close to large numbers of African-Americans (Chatman and Smith 1998). In contrast, parts of Missouri have very few African-Americans and their proportion of enrollment is extremely small, and in some cases, nonexistent. Generally, more African-American students attended two-year than four-year institutions and few attended highly selective four-year institutions. The pattern among the regional universities of the 3rd tier and the colleges of the 4th tier appears geographically determined.

MEASURES OF CENTRAL TENDENCY

The median values of four descriptive measures are shown in Table 2: parents' adjusted gross income, ACT, percentile rank in high school graduating class, sum of ACT and class rank percentiles, and straight-line distance from county of high school to county of postsecondary institution. These measures are shown for each of the four-year institutions and for groups of students clustered by parents' educational level and income. Median income clearly shows a direct association with selectivity. Students from less wealthy families tend to enroll at less selective schools and families in which parents were better educated had higher incomes. Selectivity was logically associated with ACT score, high school class rank, and total of score and rank as these were the measures used to admit students. Less obvious was the fact that ACT score varied directly with parents' educational level and income and, to a lesser extent, so did high school class rank. Linear distance was also generally associated with institutional selectivity and students with better-educated and wealthier parents on average traveled farther for their higher education. Median distance is a marginally useful measure as it only describes only the middle case and for most of these institutions, linear distance was distance from nearest major urban center.

Taken singularly, these variables suggest that economic and social barriers do exist but that the nature of these barriers is complex. Four-year institutions generally, and more selective four-year institutions especially, tended to enroll students with more advantages: better educated parents, parents have higher income, students attended high schools with fewer poor students. Students from these conditions tended to score higher on the ACT, were more likely to complete the core course requirement in high school, and were willing to travel farther to attend school. Table 3 begins the task of examining some of the key interrelationships among variables.

INTERRELATIONSHIPS

Table 3 shows the joint distribution of parental education and income. Collectively, there were few surprises. In general, better-educated parents had higher incomes (40 percent) but many did not. Fourteen percent of families where both parents had college degrees earned less than \$25K. Conversely, an equal percentage of families where neither parent had a college degree

earned more than \$66K. One compelling observation to be made of these data is that parental educational level was very clearly associated with income. Also noteworthy were the facts that students with better-educated parents attending two-year schools were more likely to be from the atypical group with income less than \$25K, and first-generation students whose parents were in the upper quarter were more likely to attend four-year schools. Overall, 14 percent of students with college educated parents earned less than \$25K but for those attending two-year schools, the figure was 24 percent. Conversely, while 14 percent of families without a college-educated parent earned \$66K or more per year, the corresponding figure was only 8 percent for those attending two-year schools.

Table 4 distributes students by parental adjusted gross income by wealth of the high school student body and shows the interrelationship of parental income and high school wealth. Students with wealthier parents were much more likely to have attended high schools with wealthier student bodies. For example, 42 percent of students with parental adjusted-gross-incomes of \$66K or more attended the wealthiest quarter of high schools. Only 17 percent of those with parents earning \$25K or less did. The interaction of parental wealth and wealth of high school does combine to affect the type of institution attended. For example, while 53 percent of those attending high schools from the poorest quarter did not have a parent with a college degree, only 39 percent of those attending four-year schools fit this pattern. Among high schools in the same quarter, parental income influenced the type of institution attended. This suggests that parental income, more than parental education, influences type of institution attended among students from high schools in the same quarter.

Table 3: Education and Income

Campus	Parental Income (Adjusted Gross)					Sum	%
	< \$25K	\$25-44K	\$44-66K	> \$66K			
Freshmen at 2- and 4-Year							
Both parents have college degrees	358	531	686	1070	2,645	30%	
Row %	14%	20%	26%	40%			
Column %	17%	24%	31%	48%			
One parent has a college degree	630	687	691	684	2,692	31%	
Row %	23%	26%	26%	25%			
Column %	29%	32%	31%	31%			
Neither parent has a college degree	1,158	960	837	472	3,427	39%	
Row %	34%	28%	24%	14%			
Column %	54%	44%	38%	21%			
Totals	2,146	2,178	2,214	2,226	8,764		
	24%	25%	25%	25%			
4-Year Only							
Both parents have college degrees	259	433	583	956	2,231	33%	
Row %	12%	19%	26%	43%			
Column %	18%	27%	33%	50%			
One parent has a college degree	436	484	557	579	2,056	31%	
Row %	21%	24%	27%	28%			
Column %	31%	30%	32%	30%			
Neither parent has a college degree	730	675	627	390	2,422	36%	
Row %	30%	28%	26%	16%			
Column %	51%	42%	35%	20%			
Totals	1,425	1,592	1,767	1,925	6,709		
	21%	24%	26%	29%			
2-Year Only							
Both parents have college degrees	99	98	103	114	414	20%	
Row %	24%	24%	25%	28%			
Column %	14%	17%	23%	38%			
One parent has a college degree	194	203	134	105	636	31%	
Row %	31%	32%	21%	17%			
Column %	27%	35%	30%	35%			
Neither parent has a college degree	428	285	210	82	1,005	49%	
Row %	43%	28%	21%	8%			
Column %	59%	49%	47%	27%			
Totals	721	586	447	301	2,055		
	35%	29%	22%	15%			

SUMMARY OF OBSERVATIONS

Considered collectively, these data help show the spiraling nature of economic circumstance and education. For the most part, students with wealthier parents were also students with better educated parents. They lived in areas served by wealthier high schools, they scored higher on the ACT, and they were more likely to have completed a college preparatory core in high school. They were subsequently more likely to attend four-year schools generally and more selective schools specifically and were willing to travel farther to do so. In contrast, first-generation students tended to be from poorer families, attended high schools with more poor students, had lower ACT scores, and were less likely to have completed a college preparatory core. Subsequently, they were more likely to attend two-year institutions. Put simply, this is not a playing field that can be made level by need-based financial aid offered for college attendance. Access to more selective four-

year institutions is made more likely by the existence of available aid but economic and social barriers to attendance at four-year institutions generally, and more selective institutions specifically, continue to be a problem.

How do these patterns affect African-American students? Table 5 (on the following page) begins to address the question by contrasting the social and economic conditions of African-American and other students. The observations are unfortunately not unexpected. Even noting that African-Americans were less likely to attend higher education, those who did were

more likely than other students to be from poorer families, to be first generation, and to have attended high schools in the poorest quarter. Overall, 25 percent of students had parents earning \$25K or less. Nearly half (47 percent) of African-American students' parents earned \$25K or less. Overall, 40 percent of students were first generation. Forty-five percent of African-American students were first generation. Overall, 16 percent of all students had attended high schools in the poorest quartile. Thirty-five percent of African-American students attended high schools in the poorest quarter. Considered collectively,

African-American students are more likely to face economic and social barriers to attendance. Given that African-American students face barriers disproportionately, it might be possible to accomplish racial diversity targets by ignoring race and instead attacking the social and economic barriers faced by students of all races. The third section of this article reports on attempts to do so.

Section 3: Social and Economically Directed Intervention

Recall from Table 1 that 8 percent of all traditionally aged first-time 1997 freshmen from Missouri high schools were African-American. Unfortunately, ACT and high school rank figures were not as available for African-American students. Within the limits of available data, 6.1 percent of freshmen were African-American. This 6.1 percent includes students enrolled at both two- and four-year institutions. Students attending two-year institutions were included if rank and test score information were available, but two-year institutions did not require this information and many were lost. The target proportion for the intervention was therefore about 6.1 percent.

To establish a baseline rate by selectivity, students were distributed solely on the basis of sum of test score and high school class percentile rank. The tiers were defined as students with totals of 50, 80, 110, or 140 and above. These are roughly the totals that fell at the 10th percentiles for clustered four-year institutions. Also note that the tiers are cumulative in that students who qualified for the most selective tier also qualified for the least selective tier. This is especially important in Missouri because this state has a system of overlapping tiers with competing merit-based scholarship programs.

Using race-blind policies without adjustments for social and economic barriers

Table 4: Parental Wealth and Wealth of H.S. Student Body								
Campus	Quartile Based on % of Student Body on Free or Reduced Price Lunches						Sum	%
	Poorest Quarter	Poorer Quarter	Wealthier Quarter	Wealthiest Quarter				
Freshmen at 2- and 4-Year								
Parental Adj. Gross Income > \$66K	110	338	569	730	1,747	23%		
Row %	6%	19%	33%	42%				
Column %	10%	22%	37%	47%				
Parental Adj. Gross Income \$44-\$66K	269	506	533	526	1,834	24%		
Row %	15%	28%	29%	29%				
Column %	24%	33%	35%	34%				
Parental Adj. Gross Income \$25-\$44K	418	595	491	473	1,977	26%		
Row %	21%	30%	25%	24%				
Column %	37%	39%	32%	31%				
Parental Adj. Gross Income < \$25K	606	610	463	343	2,022	27%		
Row %	30%	30%	23%	17%				
Column %	53%	40%	30%	22%				
Totals	1,134	1,543	1,523	1,546	5,746			
	20%	27%	27%	27%				
4-Year Only								
Parental Adj. Gross Income > \$66K	90	307	476	621	1,494	26%		
Row %	6%	21%	32%	42%				
Column %	10%	19%	30%	37%				
Parental Adj. Gross Income \$44-\$66K	208	410	432	480	1,530	26%		
Row %	14%	27%	28%	31%				
Column %	22%	26%	27%	29%				
Parental Adj. Gross Income \$25-\$44K	283	441	359	349	1,432	25%		
Row %	20%	31%	25%	24%				
Column %	30%	28%	23%	21%				
Parental Adj. Gross Income < \$25K	364	423	319	227	1,333	23%		
Row %	27%	32%	24%	17%				
Column %	39%	27%	20%	14%				
Totals	945	1,581	1,586	1,677	5,789			
	16%	27%	27%	29%				
2-Year Only								
Parental Adj. Gross Income > \$66K	20	31	93	109	253	14%		
Row %	8%	12%	37%	43%				
Column %	5%	8%	25%	31%				
Parental Adj. Gross Income \$44-\$66K	61	96	101	46	304	17%		
Row %	20%	32%	33%	15%				
Column %	15%	26%	27%	13%				
Parental Adj. Gross Income \$25-\$44K	135	154	132	124	545	30%		
Row %	25%	28%	24%	23%				
Column %	34%	41%	36%	36%				
Parental Adj. Gross Income < \$25K	242	187	144	116	689	38%		
Row %	35%	27%	21%	17%				
Column %	61%	50%	39%	33%				
Totals	397	372	369	349	1,487			
	27%	25%	25%	23%				

would produce pools of admitted applicants that were 2.7 percent African-American in the most selective tier, 3.9 percent in the next tier, 5.0 percent in the third tier, and 5.6 percent in the most open tier. These figures were compared to distributions created by adding various numbers of points to the percentile totals based on high school student body wealth (poorest quarter), parental adjusted gross income (less than \$25K), and the combination of both. In the extreme case of adjustment, 75 points were added for a parental income less than \$25K and 75 points were added for high school in the lowest quarter based on percentage of students qualified for free- or reduced-price lunches. In this extreme intervention, students from poor families who attended a poor high school would have 150 points added to their percentile rank total and would automatically qualify for admission to the most selective tier (minimum of 140). In this extreme case, the percentage of the admitted pool of students who were African-American was 5.2 percent. Speaking generally, adjustments for parent's income were slightly more successful than those for school wealth (Chatman and Smith 1998).

While the weightings were unable to reach the target value, they did show that base-rate racial distributions can be significantly improved by modest socially and economically based adjustments for conditions common to students of all races.

Table 5: African-American Distribution Comparisons

Campus	African-Americans		All Others		All	
	n	%	n	%	n	%
Parental Adj. Gross Income						
Parental AGI >\$66K	95	15%	2,160	26%	2,255	25%
Parental AGI \$44-\$66K	84	13%	2,162	26%	2,246	25%
Parental AGI \$25-\$44K	167	26%	2,044	25%	2,211	25%
Parental AGI < \$25K	306	47%	1,896	23%	2,202	25%
Parental Education Level						
Both parents have college degree	169	21%	2,542	30%	2,711	29%
Only one parent has college degree	270	34%	2,577	30%	2,847	31%
Neither parent has college degree	363	45%	3,403	40%	3,766	40%
High School Student Body Wealth						
Wealthiest Quarter	217	15%	5,451	33%	5,668	32%
Wealthier Quarter	397	28%	4,747	29%	5,144	29%
Poorer Quarter	302	21%	3,951	24%	4,253	24%
Poorest Quarter	492	35%	2,327	14%	2,819	16%

What intervention would have been required to reach parity if the policies were race-conscious? An adjustment of 41 points for African-Americans would produce a top tier pool that was 6.1 percent African-American. Not surprisingly, the most efficient way to reach racial distribution targets was by race-conscious adjustments.

The potential success of the politically appealing solution of admitting students based on high school class rank alone was also examined. Even though the predictive validity of class rank is not as high as high school grade point average, and even

though the predictive validity of class rank varies more by race and social and economic circumstance, its use in admissions would create a numerically more diverse student body for Missouri. Compared to base rates, a tiered system that used high school class rank did produce a more racially diverse student body than a system that used test score and rank (Chatman and Smith). This replicates Astin's 1978 observation that models including test scores required greater adjustment and it generally supports the diversity objective of the Texas policy.

Summary

Public support has always been stronger for creating opportunities for qualified students to overcome disadvantages than for interventions based on race even if race and the likelihood of being disadvantaged were highly correlated. In retrospect, if discrimination remedies had been more concerned with equitable preparation and opportunity and less with proportional representation, universities might have developed policies that would have been both better received and more successful. As it is, the policies were not particularly successful and are being eliminated by legal challenge and political action.

This paper was structured to answer three questions. First, are commonly used admissions measures valid and is their validity different for students of different races and economic circumstances? Second, is there evidence that economic barriers to postsecondary attendance exist among public institutions in spite of affirmative action programs and financial aid opportunities? And third, can admissions models designed to overcome the social and economic barriers faced by students of all races produce racially diverse student bodies?

The first question addressed an issue that is fundamental in admissions but is often overlooked. Are the admissions measures required valid predictors and are they equally valid for students of different races and different circumstances? The issue of race-bias in admission is not made moot by judicial action or legislation that eliminates race from the admissions process. Three measures were studied: ACT, high school GPA in core courses, and percentile rank in high school graduating class. ACT was shown to be largely free of race bias, but class rank, while generally a better predictor, was not as effective a predictor for African-American students and for students from high schools with more poor students. High school GPA was generally as good a predictor as class rank and showed less evidence of economic and racial bias. It was noted that high school class rank functioned to systematically over-predict African-American student performance.

The second question addressed evidence of economic barriers to attendance at four-year colleges and universities. Do economic and social barriers exist that hinder enrollment of students at four-year colleges generally and selective universities specifically? Yes, and as African-Americans were disproportionately disadvantaged, they met these barriers more often. Evidence of existing barriers to admittance and enrollment

included differential preparation, familial experience, and personal financial resources. Students attending more selective four-year institutions were more likely to be from more wealthy families, to have attended high schools with fewer poor students, and to have parents both of whom were college graduates. These students were more willing to travel farther to attend school and were more likely to have completed a college preparatory core while in high school. They also had higher ACT scores. As African-American students were more likely to be from poorer circumstances, they faced admissions barriers more often.

The third question attempted to obtain proportional racial representation by offsetting the economic disadvantages more often experienced by African-American students. Can proportional representation be attained by overcoming those economic barriers faced by minority and majority students? Yes, or at least representation in the pool of accepted applicants can be much improved. In terms of the admitted pool, relatively modest point-based interventions can overcome the social and economic barriers, but much larger point-based interventions were required to reach racial parity. Whether the magnitude required for racial parity would be publicly acceptable is questionable. A switch to admissions based on class rank alone was also considered and was found to be more successful initially. The public would also probably more easily support it. Unfortunately, the reason that class rank would function better was that it does not predict performance as well for African-American students. For purpose of comparison, race-conscious policies were considered and were found to reach parity with less adjustment. The most expedient interventions were those based directly on the target characteristic, an obvious finding but one to remember.

It should be noted that barriers met at admission are not the only postsecondary barriers disproportionately faced by African-American students. Even before the recent judicial and legislative actions, federal programs were shifting support from grants to loans and were reducing the real value of both. For example, the value of the average Pell grant declined by 24 percent from 1975 to 1990 while the real value of loans declined (Mumper 1993). This produced a situation where four-year colleges became less affordable for poor students and two-year schools became more affordable. This combination may be one of the causes of the declining African-American college-going rate generally and, for those who do attend, the increasing proportion who attend two-year institutions (Bureau of Census 1997). Other postsecondary barriers disproportionately faced by African-American students include increased attrition rates and the long-term economic disadvantage of acquired educational loans. Cabrera and colleagues found that social and economic status was positively related to retention and Francis notes the long-term financial consequences of indebtedness. Put simply, poorer students are more likely to drop out (Cabrera, Stampen and Hansen 1990) and the increasing reliance on loans to create access leads to striking long-term disadvantages in accumulating capital (Francis 1990).

Limitations

There are many limitations associated with this study. Some of the more significant are the extent to which students submitting FAFSA forms were representative of students generally, whether the characteristics of the accepted applicant pool would mirror the matriculating student pool even with targeted incentives, and whether institutions could manage the numerically larger pools so that minimum requirements were not simply raised to limit access. Last, the extent to which Missouri patterns were typical of other states is unknown. While Missouri is near midrange on many rankings, including Pell Grant participation rates, it is low on the list when it comes to need-based awards (Johnson and Katsinas 1997). Also a problem for those from many other states is the paper's exclusive focus on African-American students. Even if Missouri's patterns are similar to those found for other states, the patterns for African-Americans might differ from state to state and might differ from those for other disadvantaged minorities.

References

- Affirmative Action Wins a Major Victory in the U. S. Senate. 1998. *The Journal of Blacks in Higher Education*. Spring:12-13.
- Astin, A.W. 1978. Quantifying disadvantage. *New Directions for Higher Education*. 23:75-83.
- Astone, B. and E. Nunez-Wormack. 1990. *Pursuing Diversity: Recruiting College Minority Students*. ASHE-ERIC Higher Education Report No. 7. Washington, D.C.: The George Washington University, School of Education and Human Development.
- Breland, H.M. 1978. *Population Validity and College Entrance Measures*. Research Bulletin (RB 78-6). Princeton, NJ: Educational Testing Service.
- Bureau of Census 1997. *Statistical Abstract of the United States: 1997* (117th edition). Washington, DC.
- Cabrera, A.F., J. O. Stampen, and W. L. Hansen. 1990. Exploring the effects of ability to pay on persistence in college. *The Review of Higher Education*. 13(3):303-336.
- Chatman, S.P. 1992. *Predictive Validity of Admissions Measures: Evidence of Racial Predictive Bias*. A local institutional research publication.
- . 1996. *An Examination of UM-St. Louis Freshman Admissions Policies*. A local institutional research publication.
- . 1997. *Economic Bias in Admission Requirements*. A local institutional research publication.
- Chatman, S.P. and Smith, K. 1998. Can Race-Blind Policies Produce a Diverse Student Body? Paper Presented at the Annual Forum of the Association for Institutional Research. Minneapolis. ED422807.
- Cole, N. S. 1981. Bias in testing. *American Psychologist*. 36(10):1067-1077.
- Francis, C. 1990. Student aid: Is it working like it is supposed to? *Change*. 22 (July/August):35-43.
- Freidl, J. 1999. Needed: Documentation of how affirmative action benefits all students. *Change*. 31(4):40-45.
- Fuller, B. and P. P. McNamara. 1978. Defining and assessing disadvantage. *New Directions for Higher Education*. 23:61-73.
- Garfield, L. Y. 1997. Squaring affirmative action admissions policies with federal judicial guidelines: A model for the twenty-first century. *HEES Review*. 7(3) Spring. [On-line]. Available: <http://www/review.org/issues.vol7no3.html>.
- Hargadon, F. 1981. Tests and college admissions. *American Psychologist*. 36(10):1112-1119.
- Healy, P. 1998. Affirmative action survives at colleges in some states covered by Hopwood ruling. *The Chronicle of Higher Education*. 24 April:A42-A43.
- Heffernan, E. and F. Bazluke. 1996. *Minority-Targeted Admissions and Financial Aid Programs*. National Association of College and University Attorneys.

Johnson, J. L. and S.G. Katsinas. 1997. *Outside Looking In: Comparing Missouri to the Nation*. 1997 Missouri Governor's Conference on Higher Education on Higher Education, St. Louis.

Kaplan, W. A and B. A. Lee. 1995. *The Law of Higher Education: A Comprehensive Guide to Legal Implications of Administrative Decision Making*. (3rd ed.). San Francisco: Jossey-Bass Publishers.

Lederman, D. 1998. Jockeying intensifies over proposal to bar racial preferences in admissions. *The Chronicle of Higher Education*. 8 May:A36.

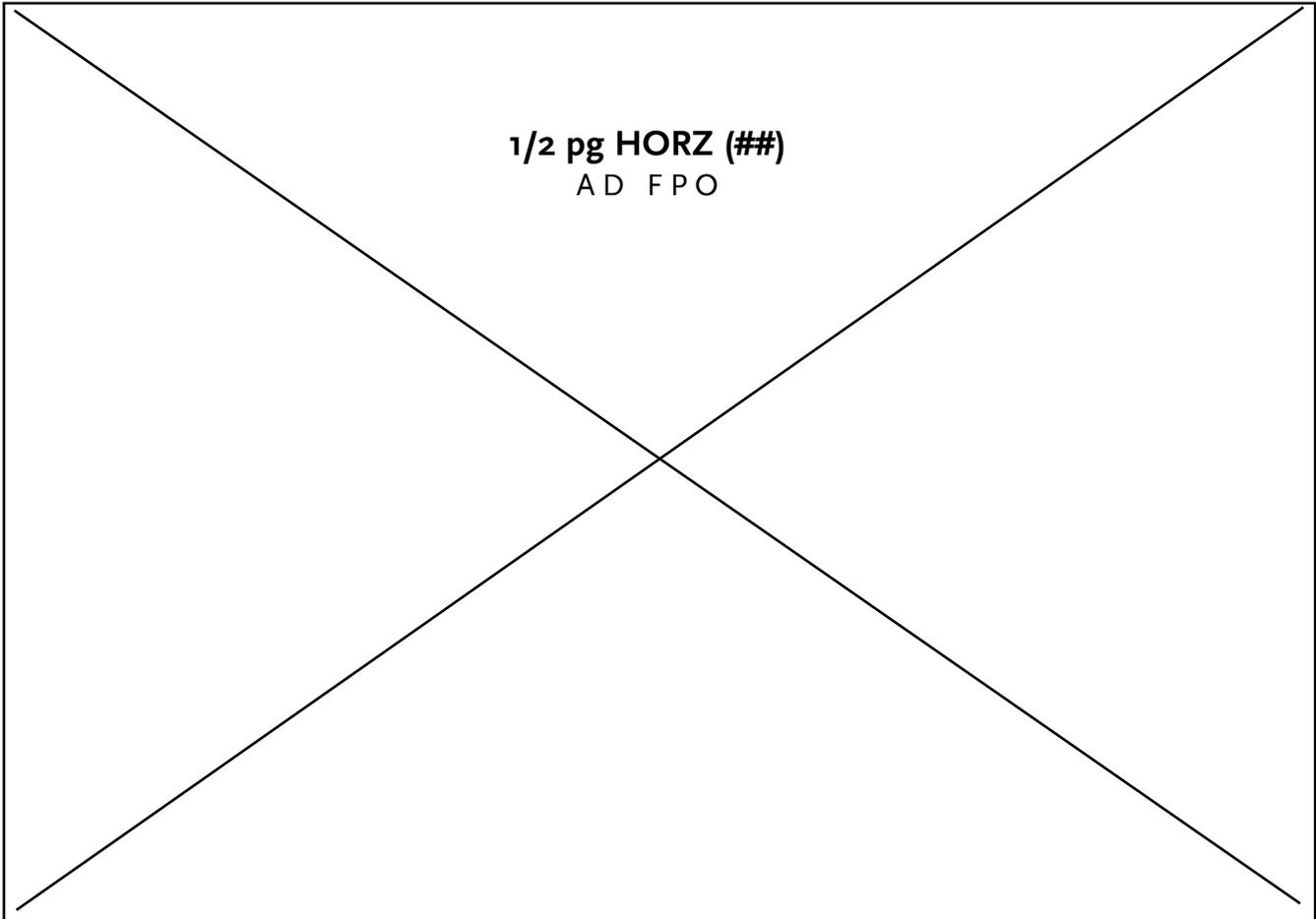
Linn, R.L. 1984. Selection bias: Multiple meanings. *Journal of Educational Measurement*. 21(1):33-47.

Mumper, M. 1993. The affordability of public higher education: 1970-1990. *The Review of Higher Education*. 16(2):157-180.

Preer, J.L. 1981. Minority Access to Higher Education. *AAHE-ERIC/Higher Education Research Report No. 1*. Washington, D.C.: American Association for Higher Education.

Strosnider, K. 1997. Clinton defends the use of affirmative action in higher education. *The Chronicle of Higher Education*. June 27:A31.

Texas A & M surgically removes the MCAT test as a prerequisite for admission to medical school. 1998. *The Journal of Blacks in Higher Education*. Spring:10.



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AD FPO

The Perceptions of College and University Enrollment Managers on the Relationship Between Institutional Enrollment Performance and Enrollment Management Effectiveness

In this time of limited financial resources, two concerns of higher education have become paramount: enrollment growth and improvement of academic quality. Evolving demographic conditions and changing state and federal aid programs are likely to alter the composition and characteristics of the student body on many campuses. Uncertain socioeconomic trends along with a growing public dissatisfaction toward the pricing and support for higher education should exert real pressure upon higher education and affect institutional enrollment cycles.

In response to these concerns, many colleges and universities are more closely monitoring and shaping the characteristics of their student bodies. Traditional efforts to cultivate academic quality and maintain enrollment levels include recruitment and retention programs. The problem, however, is that these programs are typically developed and carried out apart from one another. Too often, the result is a set of programs and policies that work at cross-purposes. To remedy this situation, enrollment management attempts to coordinate and monitor the recruitment and retention programs and policies which influence student enrollment.

The basic assumption of enrollment management is that institutions of higher education can exert more influence on their enrollments through systematic efforts in the areas of marketing, organizational operations, pricing policies, recruitment, retention activities, and strategic planning. The guiding proposition is that if institutional programs and services are

interrelated through intentional coordination of services, then an institution can be more responsive to students and their educational needs. Thus, the enrollment management model attempts to satisfy both the institution's need for stable tuition and fee revenues and the student's desire to obtain a quality college education.

The purpose of this study was to examine the perceptions of enrollment managers at different types of undergraduate institutions concerning the effectiveness of the enrollment management model to determine if use of enrollment management strategies and activities affects enrollment performance. Results of this study should provide educational leaders with increased understanding of the relationship between enrollment management effectiveness and enrollment performance at different types of undergraduate institutions.

One major research question guided this study: What are the perceptions of enrollment managers regarding the relationship between enrollment management effectiveness and enrollment performance at two-year public institutions, two-year private institutions, four-year public institutions, and four-year private institutions?

Review of the Literature

While many institutions have not implemented comprehensive enrollment management systems, a good number have incorporated some of the components of the enrollment management model into their recruitment and retention programs as a way of optimizing student enrollments (USA Group Noel-Levitz 1998). Some have reorganized their recruiting and retention functions while others have adopted new enrollment management strategies calling for increased coordination between campus constituencies without making structural changes. Although many institutions report significant enrollment growth as a result of this approach, little research has been conducted assessing the overall effectiveness of the model in supporting institutional enrollment goals (Pollock and Fox 1989).

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Based on a qualitative study involving 16 independent and six public enrollment management programs, Dolence (1989-90) developed 12 effectiveness indicators for enrollment management programs. They are, according to Dolence, not of equal importance but cannot be ranked. The effectiveness indicators are:

- **Assessments:** Inputs into the strategic planning process (*i.e.*, key performance indicators, enrollment management calendar, student faculty needs and priorities).
- **Comprehensiveness:** A “strong linkage” with academic programs, an institution-wide recruitment and retention program, and an operations orientation.
- **Definitions and classifications:** A common set of definitions and classification systems including an adequate recruitment structure, a complete retention classification system, and a comprehensive list of operational responsibilities.
- **Documentation:** The recording of the process, the changes in the process, and any assessments determined.
- **Evaluation:** The process by which an institution learns how much of what it set out to do was accomplished and how well it was done.
- **Key performance indicators:** A detailed list of measurements the institution considers key to monitoring and evaluating enrollment management strategies.
- **Leadership:** A clear and concisely written charge establishing the enrollment management program which initiates a formal strategic planning process, states in unambiguous terms who is responsible, articulates a commitment to make decisions, and expresses a commitment to implement the program once designed.
- **Participation and integration:** Participation of senior administration, academic governance, academic administration, faculty, and the persons responsible for strategy and tactical implementation.
- **Resources:** Effective resource allocation systems, which utilize consensus building and link enrollment management objectives directly with manager performance evaluations.
- **Strategies:** Straightforward, easy to understand, and workable strategies which fit within the resources of the institution.
- **Systems:** The integration of support systems; accurate, secure, and available data; and access to the “right” tools (*i.e.*, telephone registration, executive support systems, computerized mapping systems, and student surveys) to ensure that tasks are accomplished accurately and in proper sequence.
- **Timing:** A master enrollment management calendar which shows how decisions are made, who makes them, and on what basis they are made.

College and university enrollment managers appear to have focused their attention more on each of the enrollment management components—planning, institutional marketing, organizational models, admissions and recruitment activities, and retention programs—than on evaluating the effectiveness of their individual programs. Dolence has provided the literature with an approach to assessing the effectiveness of the enrollment management model.

Methodology

The population for this study was the total undergraduate enrollment managers employed by the nation’s regionally accredited postsecondary educational institutions. A non-proportionate stratified random sample of these officials was used to ensure that each institutional type is adequately represented by the sample. Stratification was in terms of institutional type, with the sample subdivided equally between private two-year institutions, private four-year institutions, public two-year institutions, and public four-year institutions. Sample data were obtained from the *Higher Education Directory* (1996).

Using an alpha level of 0.05, a beta level of 0.20, a power of 0.80, an effect size of 0.50 standard deviations, and an anticipated R^2 value of 0.30, the required sample size was 61.97. Assuming a response rate of 50 percent and applying a stratified four-part sample, the study used a sample size of 500.

The instrument used for data collection was a mail survey. The survey had 86 questions and was divided into four components. Part A consisted of two institutional characteristic questions, which subdivided the survey responses according to institutional type. Part B consisted of 13 recruitment and 13 retention questions, which collected information regarding the amount of 1995-96 enrollment goals, achieved. Noel-Levitz’s 1993 *National Enrollment Management Survey* provided the structure for the Part B questions. Responses to these questions were used to develop an enrollment performance index representing the dependent variable. Part C included 49 items regarding the perceived effectiveness of 12 major enrollment management factors. Dolence’s (1989-90 and 1993) writings on enrollment management effectiveness form the basis of the Part C questions. Responses to Part C questions were used to develop an enrollment management effectiveness index. Part D collected respondent information for follow-up purposes.

The surveys were coded and the data analyzed using SPSS for Windows, Version 6.1. The computer analysis revealed a Cronbach’s alpha coefficient of 0.972, indicating that the survey instrument has sufficient internal consistency. Cronbach alpha coefficients ranged from a low of 0.1706 for systems to a high of 0.9134 for evaluation. Ten of the 12 enrollment management effectiveness factors had reliability coefficients equal to or greater than 0.7429, indicating sufficient internal consistency. One factor, timing, had a marginal reliability coefficient of 0.6667. The reliability coefficient for systems of 0.1706 indicates that this factor lacks internal consistency.

Simple linear regression techniques were used to determine the strength of the relationship between enrollment management effectiveness and enrollment goal achievement at each institutional type.

Findings

DESCRIPTION OF THE SAMPLE

More than half of the surveys were completed and returned for a total of 261, resulting in an overall 52 percent response rate. Three of the four stratifications also reached the 50 percent benchmark. Response rates were 48.8 percent for private two-year institutions, 54.4 percent for public two-year institutions, 52.8 percent for private four-year institutions, and 52.8 for public four-year institutions. The response rate overall and by stratification was near or better than the expected response rate.

Respondents were mostly deans/directors of admissions, deans/directors of enrollment management, registrars, or registrars/directors of admissions. Table 1 provides a complete listing of the number and percent of respondent job titles. While all institutional types had at least one quarter of their respondents as deans/directors of admissions, there are some noticeable differences between institutional type respondents. Public two-year institutions had a disproportionate number of deans/directors of enrollment management, deans/directors of student development, and registrars/directors of admissions. Private two-year colleges had more presidents and vice presidents of academic affairs. Private four-year institutions had a higher number of assistant/associate directors of admissions and vice presidents of enrollment management. In general, the survey respondents were those persons who were sent the survey.

Table 1: Respondents by Title

Title	Number	Percent
Assistant/Associate Director of Admissions	21	8.0
Assistant/Associate Registrar	2	0.8
Associate Director of Enrollment Services	4	1.5
Dean/Director of Enrollment Management	28	10.7
Dean/Director of Student Development	13	5.0
Director of Admissions	75	28.7
Director of Admissions/Financial Aid	11	4.2
Director of Institutional Research	6	2.3
President	3	1.1
Registrar	29	11.1
Registrar/Director of Admissions	11	4.2
Vice President of Academic Affairs	14	5.4
Vice President/Enrollment Management	18	6.9
Vice President of Student Affairs/Services	7	2.7
Other	2	0.8
Unreported	16	6.1
Total	261	100.0

An index for enrollment management effectiveness was developed by summing the scores for the 12 enrollment management factors identified by Dolence (1989-90). A reliability analysis of the enrollment management effectiveness index revealed a Cronbach alpha coefficient of 0.9688, indicating sufficient internal consistency.

Individual factor scores were based on a 50-point scale. A score of 10 indicates that the respondent answered, “strongly disagree” to all questions related to the individual enrollment management factor. A perfect score of 50 indicates that the

respondent answered, “strongly agree” to all questions related to the individual enrollment management factor. The total enrollment management factors index was determined by adding the scores for each of the 12 enrollment management factors.

Looking at the means for the total enrollment management factor index by institutional type, an institutional type rank ordering emerged, from highest to lowest, as follows: two-year private institutions, four-year private institutions, two-year public institutions, and four-year public institutions. This means that enrollment management appears to be more developed at two-year private institutions than four-year public institutions. Private institutions received a higher enrollment management score than public institutions. The overall index scores for the enrollment management factors by institutional type are displayed in Table 2.

Table 2: Index Scores for the Enrollment Management Factors by Institutional Type

Institutional Type	Minimum	Maximum	Mean	SD
Two-Year Private Institutions	50	549	389.85	92.82
Two-Year Public Institutions	131	529	366.64	91.40
Four-Year Private Institutions	148	524	371.66	85.56
Four-Year Public Institutions	129	511	360.70	68.96

A similar index was developed to measure enrollment performance. It is composed of two smaller indices: one for recruitment, the other for retention. The recruitment index includes scores for academic qualifications, first-time-in-college students, full-time students, gender ratio, geographic diversity, international students, non-traditional students, part-time students, racial-ethnic diversity, special talent students, total new student enrollment, transfer students, and an “other” category. The retention index includes scores for associate degree completion, bachelor degree completion, full-time students, gender ratio, geographic diversity, junior retention, part-time students, racial-ethnic diversity, senior retention, sophomore retention, total full-time equivalent enrollment, total head count enrollment, and an “other” category. A reliability analysis of the enrollment performance index revealed a Cronbach alpha coefficient of 0.8095, indicating sufficient internal consistency.

A score of 26 indicates that the institution met no recruitment or retention goals, while a score of 156 indicates that the institution exceeded all recruitment and retention goals. A score of less than 26 occurred when the respondent answered, “did not have a goal in this area” for most goal categories. Table 3 displays the index scores for enrollment performance by institutional type.

Looking at the means for the enrollment performance index by institutional type, an institutional type ranking emerged, from highest to lowest, as follows: four-year public institutions,

Table 3: Index Scores for Enrollment Performance by Institutional Type

Institutional Type	Minimum	Maximum	Mean	SD
Two-Year Private Institutions	11	78	45.90	18.46
Two-Year Public Institutions	6	86	45.65	18.56
Four-Year Private Institutions	20	103	52.44	18.51
Four-Year Public Institutions	10	99	53.47	19.57

four-year private institutions, two-year private institutions, and two-year public institutions. This means that four-year private institutions reached more of their enrollment performance goals than did two-year public institutions; four-year institutions, in general, reached more of their enrollment goals than did two-year institutions. The difference between public and private four-year institutions was, however, relatively small as was the difference between public and private two-year institutions.

TWO-YEAR PRIVATE INSTITUTIONS

An R^2 of 0.056 and an adjusted R^2 of 0.039 was found between the dependent variable, enrollment manager perceptions of enrollment performance, explained by variability in the independent variable, enrollment manager perceptions of enrollment management effectiveness at two-year private institutions. Moreover, the attributed variability was determined not significant ($\alpha=0.05$). The interaction between student housing type and enrollment manager perceptions of enrollment management effectiveness was significant at the 0.05 level ($F=2.592$, $F[0.05;3,58]=3.15$, $p<0.041$). The increase to R^2 associated with the addition of the interaction term to the model was 0.229, suggesting an interaction of practical importance. Figure 1 displays the interaction between student housing type and enrollment manager perceptions of enrollment management effectiveness at two-year private institutions. According to enrollment managers, institutions in which the primary student housing type is residential tend to have more effective enrollment management programs than do institutions in which the primary student housing type is commuter.

TWO-YEAR PUBLIC INSTITUTIONS

An R^2 of 0.000 and an adjusted R^2 of -0.017 was found between the dependent variable, enrollment manager percep-

tions of enrollment performance, explained by variability in the independent variable, enrollment manager perceptions of enrollment management effectiveness at two-year public institutions. This relationship is not significant ($\alpha=0.05$). The interaction between undergraduate enrollment and enrollment management effectiveness was found to be significant ($F=1.986$, $F[0.05;2,65]=3.15$, $p<0.045$) at the 0.05 level. The increase in R^2 associated with the addition of the interaction term to the model was 0.233, suggesting an interaction of practical importance. Figure 2 displays the interaction term between enrollment performance and enrollment management effectiveness. Enrollment managers from institutions with enrollments below 1,000 or between 10,000 and 19,999 rated their enrollment management programs more effective than enrollment managers from institutions with enrollments between 1,000 and 9,999, or 20,000 and higher.

FOUR-YEAR PRIVATE INSTITUTIONS

An R^2 of 0.014 and an adjusted R^2 of -0.004 was found between the dependent variable, enrollment manager perceptions of enrollment performance, explained by variability in the independent variable, enrollment manager perceptions of enrollment management effectiveness at four-year private institutions. This relationship was not significant ($\alpha=0.05$). No significant interactions between enrollment manager perceptions of enrollment management effectiveness and descriptive institutional variables were found.

FOUR-YEAR PUBLIC INSTITUTIONS

An R^2 of 0.014 and an adjusted R^2 of -0.005 was found between the dependent variable, enrollment manager perceptions of enrollment performance, and the independent variable,

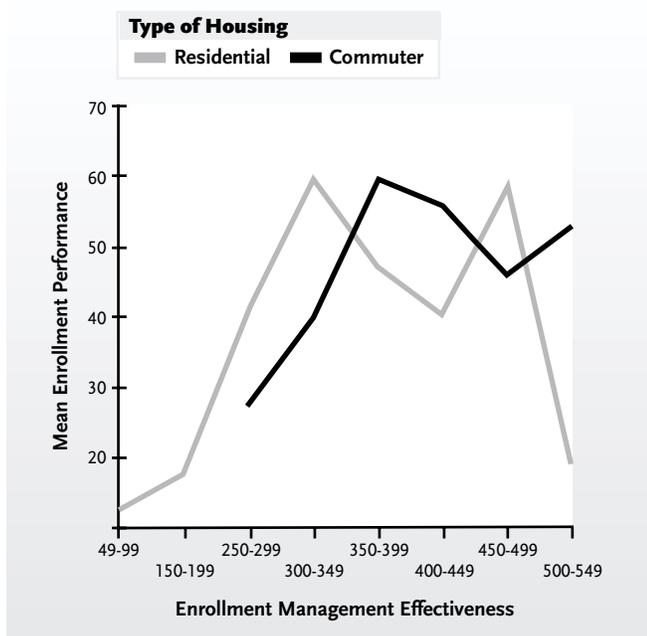


FIGURE 1: INTERACTION EFFECT BETWEEN ENROLLMENT MANAGEMENT EFFECTIVENESS AND STUDENT HOUSING TYPE AT TWO-YEAR PRIVATE INSTITUTIONS

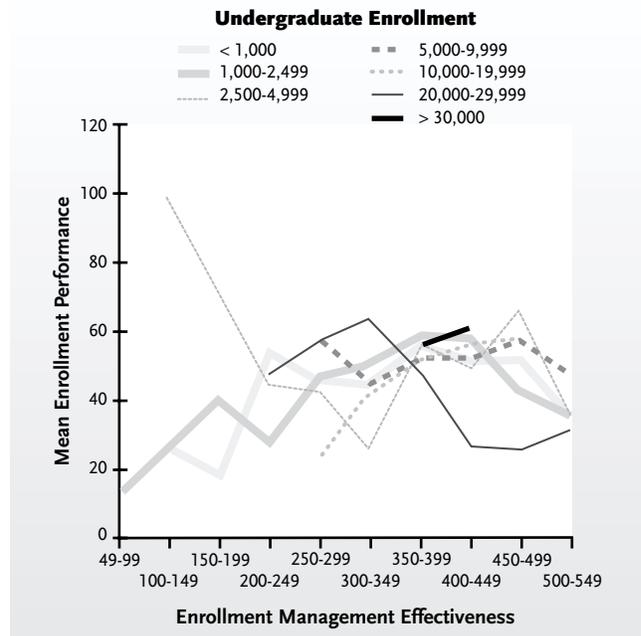


FIGURE 2: INTERACTION EFFECT BETWEEN ENROLLMENT MANAGEMENT EFFECTIVENESS AND UNDERGRADUATE ENROLLMENT AT TWO-YEAR PUBLIC INSTITUTIONS

enrollment manager perceptions of enrollment management effectiveness at four-year public institutions. This relationship was not significant ($\alpha=0.05$). No significant interactions between enrollment manager perceptions of enrollment management effectiveness and descriptive institutional variables were found.

Conclusions

Findings from the study lead to three major conclusions:

1 The perceptions of enrollment managers regarding the relative effectiveness of their enrollment management programs vary by institutional type. Looking at the means for the total enrollment management factor index by institutional type, an institutional type rank ordering emerged, from highest to lowest, as follows: two-year private institutions, four-year private institutions, two-year public institutions, and four-year public institutions. This suggests that enrollment management appears to be more developed at private institutions than at public institutions.

This conclusion is not unexpected because enrollment management first appeared at private institutions and they are generally considered to have the most developed enrollment management programs. It is interesting to note, however, that two-year private institutions received a higher enrollment management factor index than did four-year private institutions. This may possibly be explained by enrollment managers' perceptions of increasing levels of competition between two-year private institutions and two-year public institutions with open admissions and lower tuition levels.

2 The perceptions of enrollment managers regarding their relative ability to achieve enrollment goals varies by institutional type. Looking at the means for the enrollment performance index by institutional type, an institutional type ranking emerged, from highest to lowest, as follows: four-year public institutions, four-year private institutions, two-year private institutions, and two-year public institutions. This means that four-year private institutions reached more of their enrollment performance goals than did two-year public institutions; four-year institutions, in general, reached more of their enrollment goals than did two-year institutions. The difference between public and private institutions was relatively small.

This conclusion is partially inconsistent with the enrollment management literature, which anticipates that institutions with the most developed enrollment management programs will reach their enrollment goals. The literature suggests that private institutions—and particularly four-year private institutions—have more developed enrollment management programs than public institutions. This would mean that four-year public institutions appear to have improved their ability to reach enrollment goals in recent years.

3 There is a relatively small difference in the proportion of variability in the dependent variable, enrollment manager perceptions of enrollment performance, explained by variability in the independent variable, enrollment manager perceptions of enrollment management effectiveness, within the four institutional stratifications. R^2 values ranged from a low of 0.000 at two-year public institutions to a high of 0.058 at two-year private institutions. The two four-year institutional types had an R^2 value of 0.014. All were found to be statistically insignificant. Moreover, the R^2 value for all institutional types fell below the anticipated R^2 value of 0.30. This indicates either that (a) variability in enrollment performance attributed to variability in enrollment management effectiveness is less than the literature revealed or (b) the research methods used in this study were inadequate in detecting enrollment performance and/or enrollment management effectiveness.

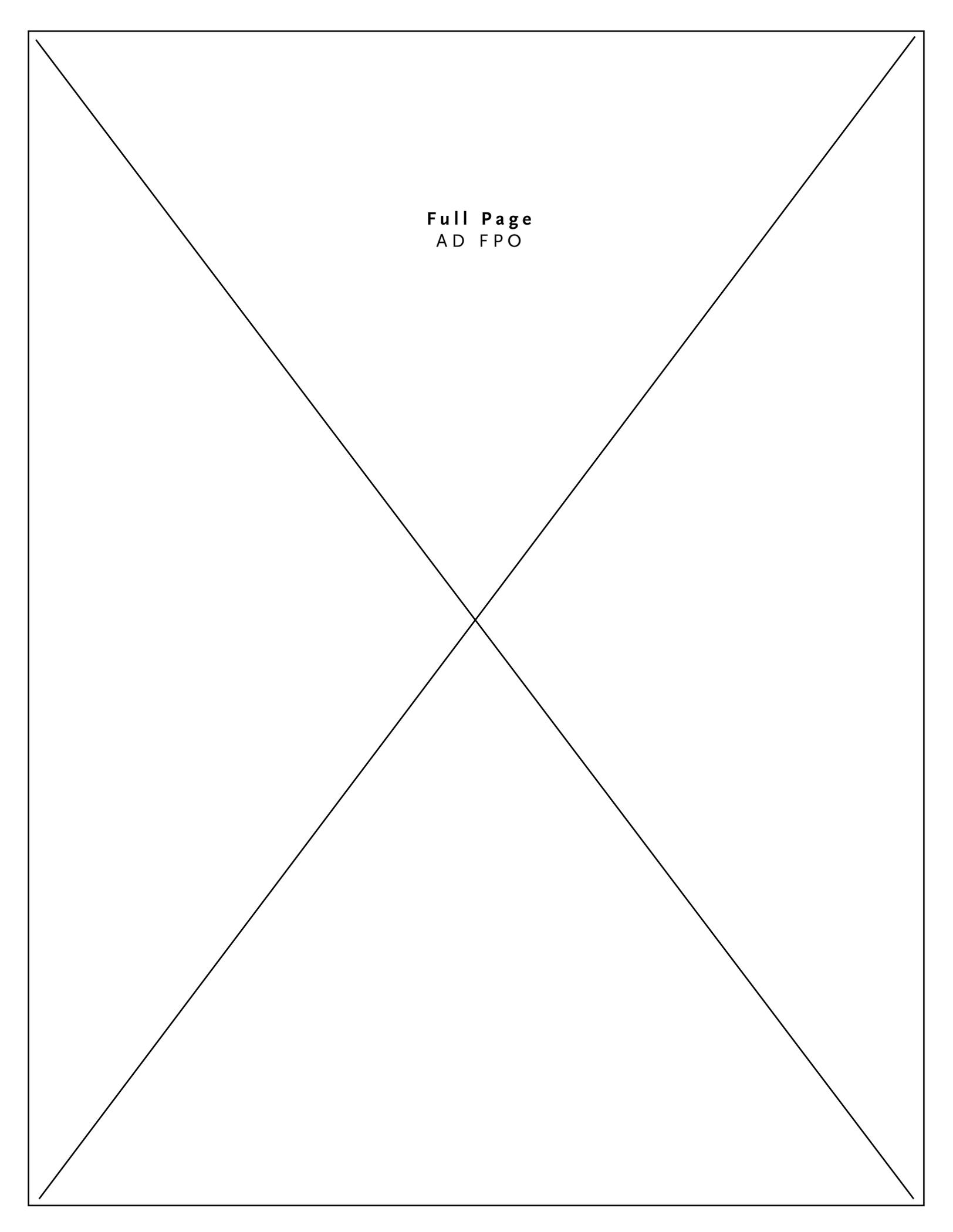
FOR FURTHER STUDY

The 12-factor enrollment management model set forth by Dolence in 1989-90 appears to lack all the factors that relate to variability in institutional enrollment performance. Further research needs to be done to examine what other factors may relate to enrollment performance. This research should not be limited to internal environmental factors, but should be widened to include student characteristics, internal educational factors, and external environmental factors.

Any further research should also incorporate construct validity into the research methodology. Construct validity refers to the degree to which a measure actually assesses the underlying theoretical construct it is supposed to assess (Light, Singer and Willett 1990). It is suggested that any further research should focus on individuals who can best represent the institution across the enrollment management spectrum. The respondents for this study were primarily chief admissions officers. Research participants should include not only those who work with new student enrollment, but also staff and faculty who are knowledgeable about academic issues, retention efforts, and student affairs. A more complete group of participants should result in more definitive research outcomes.

References

- Dolence, M. G. 1989-90. Evaluation criteria for an enrollment management program. *Planning for Higher Education*. 18(1): 1-14.
- . 1993. *Strategic Enrollment Management: A Primer for Campus Administrators*. Washington, DC: American Association of Collegiate Registrars and Admissions Officers.
- Higher Education Directory*. 1996. Falls Church, VA: Higher Education Publications.
- Light, R. J., J. D. Singer, and J. B. Willett. 1990. *By Design: Planning Research on Higher Education*. Cambridge, MA: Harvard University Press.
- The Noel-Levitz Center for Enrollment Management. 1994. *Fall 1993 National Enrollment Management Survey: Report of Findings*. Littleton, CO: Author.
- Pollock, C. R., and W. C. Fox, Jr. 1989. The status of enrollment management programs within four-year institutions of higher education. *College and University*. 64(4): 367-378.
- USA Group Noel-Levitz. 1998. *Fall 1997 National Enrollment Management Survey: Executive Summary*. Littleton, CO: Author.



Full Page
AD FPO

Transfer Students' Institutional Attendance Patterns: A Case Study

Abstract

This study examined the institutional attendance patterns of 605 two-year college students who transferred to a large, urban, public Midsouth University between Fall 1994 and Spring 1998. The purpose was to ascertain the extent of students' interinstitutional traffic, including the role of the two-year college in this traffic. Several patterns were found, including the fact that 45 percent of the students attended three or more colleges in pursuing the baccalaureate and 13 percent continued to enroll at two-year colleges while enrolled at the University.

The stereotypical profile of a community college transfer student is "one who enrolls in college immediately after high school graduation, attends the community college for two years, and then transfers to the university" (Piland 1995). The implicit assumption is that these students earn an associate's degree before transferring. Although many two-year transfers fit this profile, there is increasing evidence it is an outdated characterization. Rather, for many students the two-year college is one of several colleges attended in a circuitous route to the baccalaureate, a route that includes frequent transferring between colleges, in both the two-year and four-year sectors (Kearney, Townsend, and Kearney 1995; Townsend and Dever 1999). Also, the route does not always include receipt of an associate's degree.

Failure to understand how students use the two-year college as they seek the baccalaureate may underlie some four-year faculty and administrators' inattentiveness or even resistance to developing articulation agreements with two-year colleges. If an articulation agreement is reached, it is commonly one to accept *in toto* the Associate of Arts (A.A.) degree, generally considered to be the "transfer degree." However, in many states students who earn the Associate of Applied Science (A.A.S.) degree transfer in greater numbers than do students with the A.A. or Associate of Science (A.S.) degrees (Eaton 1991).

To provide a better understanding of how students use the two-year school in their pursuit of a baccalaureate, the author conducted a case study of the institutional attendance patterns of a group of two-year college transfers to a large, urban, public Midsouth university. This study sought to determine how many of the students transferred with an associate's degree.

Methodology

The population for this study was all students who (1) entered the University in Fall 1994 or subsequent semesters through Spring 1998, (2) were still enrolled in the Spring 1998 semester, and (3) had accumulated at least 18 credit hours from one

of the area's four two-year colleges. These four colleges were selected because they are major feeder schools for the University. For example, in Fall 1998 more than 63 percent of the University's undergraduate transfers were from these schools. Two of the colleges are located in the same city as the University and two are rural institutions located within 1½ to 2½ hours' driving time. Three of the colleges are community colleges, and one is a technical institute permitted to offer only the A.A.S. degree, considered by the state to be a non-transfer degree.

The decision to study students who had transferred in at least 18 hours rather than those who had completed a two-year degree was made to gain some perspective on the extent to which two-year transfers complete a degree before transferring. Eighteen credit hours was selected as the initial parameter, based on the recommendation of an advisory group of representatives from the two-year colleges and the university in the study.

For all four two-year colleges, the University's registrar provided the researcher with a list of students who had transferred in 18 or more hours from these schools (n=1,181) and their majors. A check of the students' academic areas indicated that the ones with the highest enrollment were business, education, and nursing. Students in these three areas were selected as the sample for this study. There were 290 business students, 238 education students, and 86 nursing students for a total of 614 students (52 percent of the population).

The transcript of each student in the sample was then downloaded and printed. Each transcript listed all colleges the

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student had attended prior to and during enrollment at the University as well as the dates of attendance. The transcript of each student who had transferred from two colleges (n=78) was reviewed to determine (1) at what point after high school graduation the student had enrolled at the two-year college, (2) how many colleges the student attended before matriculating at the University, (3) whether these colleges were two-year or four-year schools, and (4) if the student enrolled at other colleges after enrolling at the University. Several institutional attendance patterns emerged; these patterns became the categories into which students in the sample were placed, upon examination of her/his transcript.

Results

ADJUSTED SAMPLE

The initial assumption in selecting the population and sample was that all the students had transferred from a two-year college to the University. Analysis of the transcripts indicated that eight of the 614 students in the sample had initially matriculated at the University and maintained continuous enrollment at it while subsequently earning 18 or more credits at a two-year school through summer or simultaneous enrollment. These students were omitted from the sample as was another student, who had attended four four-year colleges before matriculating at the University. While enrolled at them, he had earned 33 credits from one two-year college and three from another through a combination of simultaneous enrollment and summer enrollment. Thus the adjusted sample size became 605 students in the following academic areas: 284 business students, 237 education students, and 84 nursing students.

PATTERNS OF INSTITUTIONAL ATTENDANCE

The following seven student patterns were determined:

- (1) **Traditional-Age Vertical Transfer** = Student who transferred to the University after attending one two-year college within nine months of being graduated from high school.
- (2) **Adult Vertical Transfer** = Student who transferred to the University after attending one two-year college at least 12 months after being graduated from high school or receiving a GED.
- (3) **Lateral Vertical Transfer** = Student who transferred to the University after attending two or more two-year colleges but no four-year school.
- (4) **Reverse Transfer** = Student who began at a four-year school (including the University), then transferred to a two-year college, and then transferred to the University. The student may have attended more than one four-year college before transferring to the two-year school and more than one two-year college before attending the University.

- (5) **Miscellaneous Patterns of Transfer** = Student who transferred to the University without following any of the above patterns. For example, the student may have transferred from one or more two-year colleges to a four-year college before transferring to the University. Another pattern was to vertically transfer to the University, reverse transfer to the initial two-year college, and then make a second vertical transfer to the University.
- (6) **Summer Sessioner** = Student who, after transferring to the University from a two-year college, attended one during one or more summers to earn credits to transfer back to the University.
- (7) **Simultaneous Enroller** = Student who attended the University and also enrolled at a two-year college during one or more semesters in which s/he was also enrolled at the University. The two-year college courses were transferred to the University upon their completion.

COLLECTIVE PATTERNS

The findings of this study indicate that as a group, the majority of the University's two-year transfers do not fit the stereotypical profile of community college students (*i.e.*, those who enroll immediately after high school and attend for two years before transferring to a four-year college, usually with an associate's degree). As Table 1 indicates, only 36 percent (220 students) come close to fitting this profile. Among these students, attendance at the two-year school was usually for two to three years but may have occurred over a period of 10 or more years. Also, there may have been a break in college attendance, ranging from a few months to several years before the student transferred to the University after taking courses at the two-year school. Another 15 percent (92 students) attended just one two-year college prior to transferring to the subject University, but attended as older students, people who started college at least a year after graduating from high school or completing their GED. When these two groups were combined, 52 percent (312) of the transfers in the study were vertical transfers: people who moved upwards to the four-year school by using the two-year school as the first rung on their educational ladder.

The rest of the students (48 percent or 293 students) had more complicated paths. Thirteen percent (81) attended two or more two-year colleges before transferring vertically to the

Table 1: Institutional Attendance Patterns by College within University

Pattern	Business	Education	Nursing	Total
Traditional-Age Vertical Transfer	95	101	24	220 (36%)
Adult Vertical Transfer	47	29	16	92 (15%)
Lateral Vertical Transfer	36	30	16	81 (13%)
Reverse Transfer	66	51	14	131 (22%)
Other Patterns	41	26	14	81 (13%)
Total	284	237	84	605 (100%)*

*Percents do not add up to 100% because of rounding error.

University. Another 22 percent (131) began at a four-year college but chose at some point to transfer to a two-year college. These students are called reverse transfers because going from a four-year college to a two-year college reverses the typical transfer patterns of students attending these institutions (Heinze and Daniels 1970; Townsend and Dever 1999). Interestingly, of these 131 reverse transfers, 18 (3 percent of the sample) had begun at the University. Another 13 percent (81) of the sample demonstrated a variety of institutional attendance patterns that did not fit the ones noted above. Excluding the reverse transfers who started at the University, 275 students (45 percent) were “multiple-transfer students,” defined by Kearney, Townsend, and Kearney (1995) as students “who had attended two or more colleges or universities prior to enrolling” at their current institution.

ATTENDANCE PATTERNS BY ACADEMIC AREA

Table 1 shows that traditional-age students who attended only one two-year college before transferring to the University were most likely to be education students and least likely to be nursing students. Nursing students were the most likely to be adult vertical transfers and the most likely to have attended two or more two-year schools before attending the University. They were also the least likely to have been reverse transfers, and the most apt to have followed other patterns of institutional attendance, probably because quite a few had attended nursing schools at some point.

CONTINUED ENROLLMENT AT TWO-YEAR COLLEGES

Once the transfers enrolled at the University, some (80 students or 13 percent of the sample) continued to accumulate and transfer two-year college credits either through summer enrollment at a two-year college or simultaneous enrollment at both colleges (see Table 2). At least five percent (29) of the total sample were summer sessioners at one of the four area two-year colleges, and eight percent (51 students) simultaneously enrolled at the University and at an area two-year college, usually one in the same city as the University. Some of the simultaneous enrollment occurred during the summer, but the students were counted only as simultaneous enrollers. About the same percentage of students in each college were summer sessioners (4 percent to 5 percent), but education students were least apt to be simultaneous enrollers (6 percent as compared to 10 percent to 11 percent in the other colleges).

PERCENTAGE OF TRANSFERS WITH ASSOCIATE’S DEGREE

Each of the two-year colleges in the study provided information about which students in the sample had transferred with a degree. These data revealed that 27 percent (164) of students in the sample transferred to the University with an associate’s degree, which may have been an A.A., an A.S., or an A.A.S.

Discussion and Implications

The findings of this study illustrate the several and varied ways in which students use the two-year college in their pursuit of a baccalaureate. Although the stereotypic pattern is that students will begin at a two-year college soon after they graduate from high school and then transfer directly from it to a four-year institution, usually with an associate’s degree, almost half (45 percent) of the students in the study did not fit this pattern. As

Table 2: Continued Enrollment Patterns at Two-Year College After Matriculation

Pattern	Business		Education		Nursing		Total	
	No.	%	No.	%	No.	%	No.	%
Summer Session	15	5%	10	4%	4	5%	29	5%
Simultaneous Enroller	28	10%	14	5%	9	11%	51	8%

multiple-transfer students, students who had attended at least three higher education institutions in their pursuit of a baccalaureate used the two-year college as one of several colleges. Similar findings have been reported in other studies. Piland (1995) found that 37 percent of two-year college transfers to San Diego State University were multiple-transfers. Kearney, Townsend, and Kearney (1995) also found that 44 percent of undergraduate transfers to a large, public, urban Midwestern university in Fall 1989 were multiple transfers. Educational policymakers need to be more aware that many so-called “dropouts” leave a particular college but do not leave higher education. Instead they transfer to an institution that better serves their financial, academic, or even geographical needs. Regarding the last need, Clark (1982) notes, “What looks like questionable academic ‘instability’ is actually a stable sensible phenomenon of going to school wherever you are.”

Students also transfer back and forth between institutions partly because there are so many institutional options available. The extensive growth of the public sector of higher education since the 1950s means that most locales typically have several colleges and universities. For example, within the city in which the subject University is located, there are also three private four-year colleges, several specialized colleges, the community college and technical institute included in this study, and several for-profit institutions.

The abundance of institutions in a given locale also facilitates another pattern demonstrated in students’ use of the two-year college: simultaneous enrollment at it and the University during a given semester. Students who began at the two-year college were not the only simultaneous enrollers. Recall the nine students who were dropped from the initial sample because they had begun at the University and accumulated only two-year credits, partly through simultaneous enrollment. Slark (1982) identified this practice in her study of reverse transfers at Santa Ana College in California and called these students “expeditors.” Expediting degree completion by simultaneous enrollment makes sense from a student perspective, but may not be pleasing to faculty and administrators at the four-year institution. At the University, students were supposed to have their

dean's permission to simultaneously enroll at another college, but this policy was not enforced, partly out of a concern that the University might not have the legal right to tell students it could not take courses elsewhere.

Four-year students who expedite their baccalaureate attainment by simultaneous enrollment or by taking summer courses at a two-year college partake of the two-year college curriculum and are affected by it, even though they are officially four-year college students and not traditional two-year college transfers. Knowing this makes development of course-by-course equivalency guides as well as articulation agreements for specific programs, not just the associate degrees, increasingly important.

Another phenomenon that four-year faculty and administrators need to be aware of is that of reverse transfers. Their presence in the two-year college has been noted since at least the 1960s and has ranged from over 9 percent to 16 percent of two-year college enrollment during the past three decades (Townsend and Dever 1999). Four-year faculty and administrators need to question why these students chose to leave the four-year sector for the two-year sector. What statement about their initial university experience does their transfer make?

Given the extent of transfer among institutions because of simultaneous enrollment, summer sessions, and the other transfer patterns documented in this study, there is also some "pragmatic justification for the distributive model of general education curricula, as opposed to those which currently emphasize a cohesive, four-year sequence" (Kearney, Townsend, and Kearney 1995). Efforts to establish and maintain distinctive general education curricula probably succeed best in colleges and universities with little transfer flow. The University's general education curriculum was competency-based although these competencies could be satisfied by courses offered by the University and presented in a distributive model. Efforts were made to articulate transfer students' academic records in terms of competencies rather than courses, but primarily a course-by-course equivalency occurred.

The findings also have implications for the assessment of graduating seniors through standardized tests required by policymakers bent on determining institutional accountability. Four-year college administrators should consider examining the scores of native students as compared to those of transfer students. If this is done, administrators need to be aware of the variety of institutional attendance patterns possible for transfer students. Categories of students could include two-year college transfers only; four-year college transfers only; and "other," those students who attended both two-year and four-year schools before matriculating at the institution from which they graduate.

In sum, students in this study used the two-year college in a variety of ways in their pursuit of the baccalaureate, with only about a quarter of them attaining an associate's degree before transferring. These findings illuminate not only the inadequacy of the stereotype of the two-year college transfer but also the potential of students' attendance patterns to affect their curricular experience at the four-year institution. Awareness of the complexity of student transfer can motivate institutional leaders in both sectors to emphasize the importance of articulation agreements that include course-by-course and programmatic equivalencies as well as acceptance of an associate's degree. A finer-grained analysis of graduating seniors' performance on standardized assessments might serve to sensitize four-year faculty to the importance of these agreements.

References

- Bach, Susan K., Melissa Banks, Mary K. Kinnick, Mary F. Ricks, Juliette M. Stoering, and Richard D. Wallieri. 1998. Student Attendance Patterns and Performance in an Urban Postsecondary Environment. Paper presented at the annual meeting of the Association for the Study of Higher Education, Miami, FL.
- Clark, Dean O. 1982. Reverse transfers, laterals, double transfers and other regular irregulars. *College and University*. 57(2):166-68.
- Eaton, J. Spring 1991. Encouraging transfer: The impact on community colleges. *Educational Record*. 72(2):34-38.
- Heinze, Michael C., and Jack L. Daniels. 1970. *The Transfer of Students into Community Colleges*. (ED 050 723)
- Kearney, Gretchen, Barbara Townsend, and Terry Kearney. 1995. Multiple transfer students in a public urban university: Background characteristics and interinstitutional movements. *Research in Higher Education*. 36(3):323-344.
- Piland, William. 1995. Community college transfer students who earn bachelors' degrees. *Community College Review*. 23(3):35-44.
- Slark, Julie. Y. 1982. Reverse Transfer Student Study. ED221248.
- Townsend, Barbara and John Dever. 1999. What do we know about reverse transfer students? In B. Townsend, ed., *Understanding the Impact of Reverse Transfer Students on Community Colleges* (pp. 5-14). *New Directions for Community Colleges*, No. 106. San Francisco: Jossey-Bass.

Enrollment Management as a Portfolio Investment Problem

Abstract

In the long run, a college or university's reputation depends on the accomplishments of its graduates. The more successful they are, the more successful the institution will be. Therefore, the annual enrollment management decision represents an irreversible investment in tomorrow's reputation. Enrollment management professionals are enjoying increased status at many colleges and universities. While most of this influence comes from the short run imperative to fill each incoming class, the long run implications of each annual decision may be more significant for the institution's future. As a consequence, some new insights are possible if one views enrollment management as a long run portfolio investment problem.

Ultimately, the prestige of each higher education institution is measured by the success of its graduates.¹ The alumni demonstrate the value of the institution's academic credentials and their collective financial success will limit the size of the institution's endowment. Unlike other institutional assets, successful alumni are irreplaceable. Physical plant can be replaced, while successful alumni are the result of irreversible prior decisions.² As a consequence, every entering class is an irreversible long-term investment, since some proportion of that class will become alumni. The admission decisions we take today determine the composition of tomorrow's alumni portfolio and each current administration is facilitated—or constrained—by all prior enrollment management decisions. Viewed from this perspective, enrollment management has critical long run implications for institutional development. Further, there is an important short run dynamic between good students and successful graduates beyond the obvious fact that better students tend to result in more successful graduates. The success of previous graduates tends to attract more current students and to provide more scholarship funding for better students in a reinforcing loop. Therefore, it is appropriate to consider enrollment management as a portfolio investment problem.

Each year, the institution has the opportunity to “invest” in a new group of students. The opportunity is limited by physical space and financial resources. Overall, these decisions are an optimal prospecting problem. The institution must first search³, or “prospect,” for qualified applicants. The applicant pool must be large enough to establish the institution's selectivity and to

provide the required enrollment yield. The institution can affect two student decisions: the decision to apply and the contingent decision to enroll if accepted. At each decision point, the institution takes steps to influence the student's decision. In the first step, promotional efforts determine the number and quality of the inquiries and the applications that result from those inquiries. The applicant stage is successful if the pool is large and of high quality, since the institution can be more selective in its admission standards in that case. Once students are accepted the institution can control the expected class size through its financial aid decisions.

At the inquiry stage, the institution takes steps to influence the probability the inquiring student will apply. Similarly, the institution awards scholarships, loans, and work-study offers at the enrollment stage where the objective is to influence the probability the accepted student will enroll. Conceptually, they are very similar problems. The institution's objective at the inquiry stage is to generate the largest high quality applicant pool consistent with the resources it has budgeted for recruiting applications. In this case, it is important to know which inquiries to pursue and how far to pursue each inquiry. The answer will depend on the marginal impact the institution's

¹ As an academic, I would like to believe that faculty are the most important asset. I do not minimize the role we perform in preparing students to become successful alumni; however, the outcome is ultimately up to the student. Outside of the limited professional audience who read our scholarly work, we are mostly unknown to the outside world. It is the larger public that determines the success of any institution and they are more impressed by the accomplishments of our graduates.

² If the institution allocates most of its resources to recruiting students and few resources to career services, this indicates the administration is thinking in the short term and not the long term.

³ Economic models of optimal search procedures under uncertainty can provide useful rules of thumb for optimal stopping and optimal search policies (Rothschild 1974).

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activities have on the probability a given inquiry will yield an application, which results in an “optimal stopping rule” for recruitment efforts (Rothschild 1974). The efficient employment of its scarce promotion budget requires that the institution form some implicit or explicit judgment about how its actions influence the probability an inquiry will lead to an application. Similarly, the institution must allocate a scarce scholarship budget across a pool of accepted students in order to obtain a minimum student yield and the highest quality incoming class possible from the pool of accepted students. Again, the institution must form some implicit or explicit judgment about how marginal scholarship dollars influence the probability an accepted student will enroll.

This paper contains an information technology model designed to enable the consideration of enrollment management decisions in a portfolio context. The probability a given student will enroll, following acceptance, is the model’s central building block. Since the application decision and the enrollment decision are conceptually the same, I concentrate on the enrollment model. At least for private institutions, the scholarship budget has been the most difficult expense area to control. The average discount rate among competing private institutions has risen steadily in this decade and any improvement in the management of scholarship funds releases badly needed resources for academic programs.

Expert Systems and Information Technology

Most institutions rely on “expert systems” in enrollment management. They hire admissions and financial aid experts who review individual student files and make professional admissions judgments. If the student is admitted, the experts also award merit and need-based financial aid. A “pure expert system” is defined as a system where experts review all of the candidate information and make an informed judgment on a case-by-case method. The experts may also convene as a group to collectively review the files. A modified expert system is any system where the candidate information is analyzed and/or reformatted using modern information processing techniques. Clearly, there is a continuum of such systems, with the pure expert system at one extreme and the pure information technology system at the other extreme. In theory, the pure information technology system could replace all experts with automated information technology. The systems of most practical interest are the modified expert systems between the two extremes. The recent information explosion creates an imperative to use modern information technologies. As with corporations, competition insures that any institution of higher education that fails to embrace information technology will see its prospects erode materially and in short order.

All expert systems are based on implicit judgment models. Each expert reviews a file and subjectively evaluates its contents. The information in the file is weighed against each expert’s objective function—the implicit goal the reviewer hopes to achieve through admissions and financial aid decisions. Unless the institution takes concrete steps to make sure the experts have a common understanding of the institution’s objectives, it cannot be sure the experts are working to a common purpose.

Furthermore, even if the institution takes steps to communicate the common objective, it may not be certain that each expert is working toward that goal.

In addition, learning and continuous process improvement are hard to achieve in pure expert systems. The reason for this is that the expert model is intuitive and not subject to examination. Each individual expert’s assumptions are rarely articulated. The weights attached to different types of information are not known and the institution does not know how the expert handles conflicting information. Comparing outcomes with the expert “model’s” assumptions, information weights, and analysis is extremely difficult. However, the judgment of experts is critical to every successful enrollment management system. Hence, the appropriate role for information technologies is to increase the accuracy, speed, and consistency of the experts’ judgments. Information technologies are not a substitute for judgment, they are complementary to the experts’ judgment.

The Enrollment Probability

The techniques employed in this paper have been used for some time by other institutions whose primary objective is to assess the quality of an asset portfolio. Specifically, the financial services industry spends very large sums each year on risk management and credit scoring (Boyes, Hoffman and Low 1989). The fact that these for-profit institutions expend these funds each year is clear evidence the systems work. One can find similar models in the airline and hotel industries (McPherson and Schapiro 1998). However, it is frequently argued that the airline and hotel models are indifferent to who occupies the seats or the rooms (Duffy and Goldberg 1998); i.e., the airline and hotel models are concerned only with quantity and not quality. By contrast, the quality of a loan portfolio is the central issue in credit scoring.

A workable model for managing scholarship awards requires some estimate of the probability a student will enroll given that student’s individual characteristics and the amount the college is willing to discount tuition and fees to that student. This paper contains an outline of a computer/statistical based tool, which is a supplement to be used by financial aid experts.

Let:

- T be tuition, fees, and room/board charges per student,
- δ_i be the tuition discount offered the *i*th accepted student [the “net price” for the *i*th student is then $(1-\delta_i)T$],
- x^i be a vector of characteristics such as ACT scores, high school GPA, high school class rank, etc. for the *i*th student,
- β be a vector of parameters that describes the cumulative distribution function, which is the probability of enrollment,
- S be the funded scholarship budget, and
- G be the unfunded institutional grants budget.

Then, $E[(1-\delta_i)T, x^i; \beta]$ is the enrollment probability for the *i*th accepted student.

The central building block for both the “expert” financial aid system and any statistical system is the probability function

$E[(1-\delta_i)T, x^i; \beta]$. This function is formed by subjective individual judgment in the pure expert system. There are, however, objective procedures one can employ to derive $E[(1-\delta_i)T, x^i; \beta]$. A very important difference between pure expert systems and statistical systems is that the enrollment probability function can be inspected, experimented with, and studied in statistical models. The subjective nature of the probability function in expert systems means that it cannot be inspected nor can it be studied. It exists only in the mind of each expert and it varies from one expert to the next. So, consistency in evaluation is always an issue.

Our past experience with similarly situated students provides the foundation for the statistical estimation of an objective enrollment probability. This is also the case for expert systems, they are based on individual experience, since one becomes an expert by experience. Using statistical techniques, such as logit or binomial probit, we can derive the statistical estimates of the parameters, the vector β , that define the enrollment probability. Then, the enrollment probability for each admitted student in next year's class is obtained by entering the student's characteristics, the vector x^i , and the tuition and fees discount rate, δ_i , into $E[(1-\delta_i)T, x^i; \beta]$. The estimated probability function is the central building block for an enrollment portfolio model.

Estimating the Probability Function

In order to estimate the probability a given student will enroll following acceptance, 3,089 observations were drawn from a representative small college accepted students file. The sample covers the previous three years, suggesting the college accepts approximately 1,000 students each year. Of the 3,089 accepted students, 885 actually enrolled during this period. The data file contains the following variables:

- conts**—the number of recruiting contacts by letter, telephone, video, or e-mail;
- cvst**—a zero/one variable for campus visit;
- eact**—a zero/one variable for early action;
- min**—a zero/one variable for minority status;
- fem**—a zero/one variable for gender;
- nmfin**—a zero/one variable for national merit finalist;
- nmsem**—a zero/one variable for national merit semifinalist;
- cprog**—a zero/one variable for attendance at a summer campus program;
- act**—ACT score;
- gpa**—high school grade point average (GPA);
- ntuition**—net tuition and fees for the year enrolled [$T_i = (1-\delta_i)T$];
- disc**—the scholarship discount offered the student measured as a percent (δ_i);
- oh**—a zero/one variable for senior open house attendance;
- joh**—a zero/one variable for junior open house attendance;
- hscsize**—size of high school graduating class;
- hscrank**—the rank within the high school graduating class;
- met1**—metropolitan area one;
- met2**—metropolitan area two;
- bstat**—border states;
- othst**—other states;
- wkstud**—work study award;

- loan**—amount of loan; and
- enryr**—enrollment year.

The dependent variable of interest is the dichotomous, or frequency variable, **enroll**; which is a zero/one variable indicating whether the student subsequently enrolled or did not enroll. The enrollment probability function is estimated using the binomial probit model (Judge et al. 1980). The predicted value from this model is the probability the student will enroll for each observation.

The results from this model are contained in Table 1. Generally, the signs of the parameters and their significance levels are consistent with what economic theory and intuition would suggest. As anticipated, the probability the student will enroll decreases as the net tuition increases (as the tuition discount variable, **disc**, increases, the enrollment probability increases) and the net tuition variable is significant at better than the .01 level. The fact that the number of contacts, early action, gender, and minority are not significant suggests these variables are important for the application decision. The number of student contacts is probably most important at the application stage. The signs and significance levels for loan amounts and work-study awards are as one would expect. Both are significant at better than the .01 level, but the coefficient for work-study is negative. This suggests that work-study awards are inferior substitutes for scholarship awards.

The variables that measure student quality are consistent with the impact of competition for good students. The ACT, high school GPA, high school class size, and high school class rank are all significant at least at the .01 level. The higher the

Table 1: Probit Enrollment Model

Parameter	Variable Estimate	Chi Square	Pr>Chi
INTERCPT	-173.489	6.691	0.010
CONTS	0.022	0.160	0.689
OH	0.481	44.291	0.000
JOH	0.425	5.329	0.021
CVST	0.493	41.565	0.000
EACT	0.015	0.045	0.832
MIN	-0.260	2.249	0.134
FEM	-0.005	0.008	0.930
CPROG	-0.169	1.966	0.161
ACT	-0.064	44.830	0.000
GPA	-0.197	4.996	0.025
HSCSIZE	-0.001	8.150	0.004
HSCRANK	0.004	16.693	0.000
NMFIN	0.443	2.961	0.085
NMSEM	-0.272	3.938	0.047
NTUITION	-0.0001	141.362	0.000
WKSTUD	-0.0002	9.551	0.002
LOAN	0.0001	39.389	0.000
MET1	0.136	2.538	0.111
MET2	0.065	0.331	0.565
BSTAT	-0.038	0.278	0.598
OTHST	-0.001	0.000	0.992
ENRYR	0.088	6.889	0.009

Log Likelihood	-1584.97
Observations	3089
Enrolled	885

ACT and the higher the high school GPA the lower the probability the student will enroll. The higher the high school class rank, the higher the probability the student will enroll.⁴ The sign for high school class size is negative and significant, which suggests students from larger high schools tend not to enroll in small colleges. The results in Table 1 also illustrate the importance of campus visits and open house attendance in the enrollment decision. Since these are student choices, they probably represent the students' signaling the level of their interest in enrolling.

MANAGING THE SCHOLARSHIP BUDGET

While the forgoing results are intrinsically interesting, they are not the primary reason for pursuing this model. The model is most useful for forecasting, financial planning, and the efficient management of the scholarship budget. Given the number of accepted students, the institution's central objective in managing its scholarship budget is to obtain the best and largest entering class consistent with its ability to support those students. If 'n' is the total number of accepted students, then the expected enrollment for the next class is

$$(1) N^e = \sum^n E[(1-\delta_i)T, x^i; \beta] \text{ for } i=1, 2, \dots, n.$$

The scholarship/grant budget constraint is

$$(2) S+G = \sum^n \delta_i T \text{ for } i=1, 2, \dots, n.$$

In the pure expert system the tuition and fees discount rates for each student are chosen on a case-by-case basis. Furthermore, the δ_i are chosen independently of one another. Unfortunately, the decisions we take regarding the i^{th} student will influence what we are able to do for other students. Hence, it would be very helpful if we could consider the choice of all of the δ_i 's at once.

An appropriate college objective would be to choose the δ_i 's in order to maximize the expected enrollment (1), subject to the budget constraint (2). Note that a prior quality screening has already taken place, since the admissions experts have reviewed the applicant's files and accepted them for admission to the college. The Lagrange form of the expected enrollment model is

$$(3) \max N^e = \sum^n E[(1-\delta_i)T, x^i; \beta] + \lambda[S + G - \sum^n \delta_i T].$$

The first order conditions are

$$(4.a) \partial N / \partial \delta_i = -E_T T - \lambda T = 0 \quad \forall i = 1, 2, \dots, n$$

$$(4.b) \partial N / \partial \lambda = S + G - \sum^n \delta_i T = 0,$$

where E_T is the derivative of (1) with respect to net tuition and fee price. The equations in (4.a) and (4.b) constitute a system of $n+1$ simultaneous equations. The endogenous variables are the δ_i 's and the Lagrange parameter λ . The solutions to this system exist if the second order conditions are satisfied. The second order conditions require that the principal minors of the bordered Hessian alternate in sign pattern beginning with positive.

Note,

$$\partial^2 N / \partial \delta_i \partial \delta_j = 0 \quad \forall i \neq j.$$

So, the bordered Hessian matrix for the system of equations in (4) is a diagonal matrix and if $E_{TT} T^2 < 0$, then the second order conditions will be satisfied.

Taken together, the first and second order conditions reveal several characteristics of the solutions. The first order conditions in (4.a) imply that the probability of enrollment must be a decreasing function of the net tuition and fee price, $E_T < 0$, and the optimal δ_i are found where

$$(5.a) E_T [(1-\delta_i)T, x^i; \beta] = E_T [(1-\delta_j)T, x^j; \beta] \quad \forall i \text{ and } j$$

and

$$(5.b) S + G = \sum^n \delta_i T.$$

The enrollment probability should be a decreasing, convex function of the net tuition and fee price and the optimal discounts per student can be found by equating the first derivatives of the enrollment probability with respect to the net price for each student, given that the scholarship budget constraint is met. Once the enrollment probability function is estimated, as in the previous section, a computer program can be written to find the optimal δ_i which satisfies the system of equations in (5.a) and (5.b). The optimal deltas from this solution are the first step in the portfolio evaluation process. They represent the starting point for the financial aid experts who review the files.

As an illustration, suppose the targeted incoming class size is 300 students and the expected enrollment from equation (1), given the optimal δ_i 's from (5.a) and (5.b), is 320 students. In this instance, management can trade off expected enrollment for a higher quality incoming class. The financial aid experts would be instructed to move financial aid dollars from less desirable students towards more desirable students. Note that the expected average ACT score is

$$(6) ACT^e = \sum^n E[.]ACT_i / N^e \text{ for } i=1,2, \dots, n.$$

By shifting scholarship funds from lower ACT students to higher ACT students, the director of financial aid can raise the expected quality of the incoming class until the expected enrollment falls to the target level. Further, for each potential distribution of the scholarship budget, management can obtain the expected values for a variety of other important variables such as, the gender mix, the expected GPA, the expected number of minority students, and the expected number of national merit scholars.

The portfolio approach to enrollment management can be structured as follows. In the fall, the observations from the entering class are added to the institution's enrollment management database and the probability model is re-estimated. The new parameter estimates are inserted into the networked computer program that contains the accepted student files in the spring. Following the spring decision regarding which students to accept, the institution runs the program to calculate the optimal discounts for that group of accepted students based on the most recent updated model from the fall. As each financial aid expert adjusts individual student discounts, the computer program

⁴ The best high school class rank is 1, while the quality of the student declines as hscrnk increases.

recalculates the expected enrollment and the expected student quality variables. In this fashion, the financial aid experts can see the portfolio effect of each individual decision and management has a constantly updated class profile.

FORECASTING AND FINANCIAL PLANNING

After the final scholarship allocation is made and the students are notified, the expected enrollment and the expected quality variables represent a forecast for the fall class. Hence, the institution will have the two most important numbers required for next year's budgeting: The expected new student enrollment and the expected average tuition and fees discount. Given the retention rates and scholarships for returning students, total student-based revenues are calculated in the spring semester of the prior academic year. The quality of the revenue forecast can be updated continuously as the fall enrollment date approaches. Once the institution receives an admitted student's deposit for the fall term, that student can be counted as an enrolled student and the expected enrollment and the expected average discount from the rest of the students who have not paid their deposits can be recalculated. Naturally, the reliability of the forecast improves as the fall enrollment date nears.

As an example, the probit enrollment probability model is applied to the accepted students file for the most recent academic year after scholarship awards are made. This set of accepted students was not included in the data set used to estimate the model. There were 1,021 students accepted for that year. The scholarship awards were *not* allocated according to the optimal delta procedure discussed above. The institution used a pure expert system to allocate scholarships. The results are contained in Table 2. The expected enrollment yield from the 1,021 admitted students is 264. The expected ACT, GPA, high school class size, and high school class rank are 26.7, 3.52, 233, and 35, respectively. The model suggests the institution can expect 12 National Merit finalist/semi-finalists. The expected number of female students is 144. The expected average discount is 40.4 percent. If tuition and fees are \$20,000, the expected net student revenue from the incoming class would be

$$R^n = (1 - .404)(20,000)(264) = \$3,146,880.$$

If the institution's target yield is 300 students with an average discount of 40.4 percent, the forgoing suggests a reallocation of the scholarship awards would be in order, since the additional 36 students would yield an extra \$429,120.

Conclusions

Enrollment management decisions are critical for long-run institutional development. Institutions are known by the collective deeds and prosperity of their alumni. Each year the institution must make an irreversible investment in its future alumni portfolio and it is constrained in its choice by physical and financial resources. The selection of the current enrollment portfolio is normally made by a team of enrollment management experts. This paper contains a modern information systems tool designed to optimize the enrollment portfolio subject to the institution's budget constraint. The information system also yields forecasts of expected enrollment, the average discount, expected average ACT scores, expected average high school grade points, gender mix, and other relevant indicators of class quality and diversity. This data would be available in mid-spring and are quite useful for the annual budgeting cycle.

References

- Boyes, William J., Dennis L. Hoffman, and Stuart A. Low. 1989. An econometric analysis of the bank credit scoring problem. *Journal of Econometrics*. 3-14.
- Clotfelter, Charles T. 1996. *Buying the Best: Cost Escalation in Elite Higher Education*. Princeton, N.J.: Princeton University Press.
- Duffy, Elizabeth A. and Idana Goldberg. 1998. *Crafting a Class: College Admissions and Financial Aid, 1955-1994*. Princeton, N.J.: Princeton University Press.
- Judge, George G., William E. Griffiths, R. Carter Hill, and Tsoung-Chao Lee. 1980. *The Theory and Practice of Econometrics*. New York: John Wiley and Sons.
- McPherson, Michael S. and Morton Owen Schapiro. 1998. *The Student Aid Game: Meeting Need and Rewarding Talent in American Higher Education*. Princeton, N.J.: Princeton University Press.
- Rothschild, M. 1974. Searching for the lowest price when the distribution of prices is unknown. *Journal of Political Economy*. 689-711.

Enrollment	264
ACT	26.7
HSGPA	3.52
Class Size	233
Class Rank	35
NMFin	3
NMSem	9
Female	144
Discount	40.4

Full Page
AD FPO

The Myth of the “Big Book”: Foreign Credentials Evaluation Resources

In this day and age of ever-shrinking college and university budgets, international admissions officers are often forced to be choosy about what resources they purchase for foreign credentials evaluation. Hence the oft-heard request for “The Big Book,” that mythical foreign credentials evaluation manual that describes not only every country’s educational system, but gives quality indicators and placement recommendations as well.

Unfortunately, since 1952, when Martena Tenney Sasnett’s 838-page behemoth *Educational Systems of the World* was published by University of Southern California Press, there has been no one volume capable of effectively summarizing the world’s educational systems. Rapidly-changing secondary and postsecondary systems, shifting national borders, and the sheer volume of information generated by quickly expanding educational opportunities world-wide ensure that a “Big Book” publication would be hopelessly out-of-date long before the ink dries.

However, even on a tight budget, it isn’t impossible to assemble a library of resources that ensure that you evaluate your international students’ credentials accurately, consistently, and in a way that makes sense for your institution. Here are some suggestions for what resources to purchase, how to best use those resources, and where to go for further information:

The Basics

“Start big and slowly get smaller.” Not your typical advice, unless you’re talking about foreign credentials evaluation resources. To get the most bang for your buck, choose a recent, comprehensive resource that depicts many educational systems

with their secondary and tertiary benchmark credentials and grading scales. NAFSA’s *A Guide to Educational Systems Around the World* is just such a book. The 1999 volume covers the secondary and higher education systems of 156 countries. Although you won’t find placement recommendations here, use this book for its educational ladders, its extensive benchmark credential information, for background information on the methodology of credential evaluation, and for useful Internet tools. At just \$65 for NAFSA members and \$90 for non-members, *A Guide to Educational Systems Around the World* will become the cornerstone of your library and is a bargain to boot. It can be ordered online at www.nafsa.org or by calling (800) 836-4994 or (412) 741-1142.

Another important resource can be found in AACRAO’s *Foreign Educational Credentials Required for Consideration of Admission to Universities and Colleges in the United States*, 4th edition, 1994. Listing the foreign credentials awarded by more than 210 educational systems world-wide, this volume is a handy desk-reference for you, but is even more useful for your front-line staff: receptionists, student workers, and other support staff who deal with the public on a regular basis. Purchase this through the AACRAO Distribution Center at P.O. Box 231, Annapolis Junction, MD 20702, by calling (301) 490-7651, online at www.aacrao.org, or via e-mail at pubs@aacrao.org. It sells for \$40 for AACRAO members and \$60 for non-members. Ask for Item #4002.

Don’t have much bookshelf space? For searchable information on the recognition status of nearly 14,000 higher education institutions in over 180 countries, the World Higher Education Database (WHED) 2000, available on CD-ROM for PC can’t be beat. It combines data found in the *World List of Universities and the International Handbook of Universities*, plus additional information not found in either of the print directories, yet costs less than the combined cost of the two bulky volumes. The Database is available to AACRAO members at \$370, or at the \$450 list price for non-members. To order, contact the

AACRAO Distribution Center at P.O. Box 231, Annapolis Junction, MD 20702, by calling (301) 490-7651, online at www.aacrao.org, or via e-mail at pubs@aacrao.org. Request Item #1501.

For a look at what real academic credentials look like from chosen countries, go with AACRAO's *International Credentials Handbooks*, Volumes I–III. These tomes feature numerous sample benchmark credentials with detailed explanations of each document. Volume I treats Australia, Ecuador, Germany, Ghana, Greece, India, Italy, Kenya, Lebanon, Mexico, People's Republic of China, Philippines, Switzerland, Taiwan, and Tanzania; Volume II looks at Argentina, Bangladesh, Brazil, Cyprus, El Salvador, Ethiopia, Finland, Indonesia, Jordan, Panama, South Africa, Sweden, United Kingdom, and Zimbabwe; and Volume III depicts credentials in the Commonwealth of Independent States, Colombia, France, Guatemala, Hong Kong, Japan, Malaysia, Pakistan, the People's Republic of China, the Socialist Republic of Vietnam, Spain, Thailand, and Turkey, as well as containing indices for volumes I, II, and III. Volumes I (Item #4003) and II (Item #4004) are available at \$20 for AACRAO members and \$30 for non-members, while Volume III (Item #4007) retails for \$30 for AACRAO members and \$40 for non-members. Order by contacting the AACRAO Distribution Center at P.O. Box 231, Annapolis Junction, MD 20702, by calling (301) 490-7651, online at www.aacrao.org, or via e-mail at pubs@aacrao.org.

Finally, for a practical all-around resource that includes international admissions policies, procedures, and sample letters and forms, as well as information on credential evaluation, turn to *The Guide: A Resource for International Admissions Professionals*. The updated 2000 edition of this essential desk manual will be available from AACRAO by the end of the 2000 calendar year.

Choose Your Weapons

Now that you're armed with one or two good, comprehensive resources, take a closer look at your institution's international student population. What areas of the world do they come from? Do any large geographical groupings become apparent when you look at your international students as a group? This is where to begin when buying country- or region-specific publications.

The *World Education Series*, published by AACRAO and PIER (Projects for International Research), features arguably the most in-depth country and region studies available. These volumes include information on institutions, admission and program requirements, grading systems, credentials awarded, continuing education, study abroad, and linkages with U.S. institutions. Sample documents and placement recommendations approved by the National Council on the Evaluation of Foreign Educational Credentials appear in the full-country and workshop reports, although the Special Reports do not contain placement recommendations. To order, contact the AACRAO Distribution Center at P.O. Box 231, Annapolis Junction, MD 20702, by calling (301) 490-7651, online at www.aacrao.org, or via e-mail at pubs@aacrao.org.

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Further, collect foreign-language dictionaries. A good credentials evaluator should aim to be able to read any language written in the Latin alphabet with the aid of a good dictionary. Free yourself from relying on translations...they are there as a tool to help you evaluate, not as documents to be evaluated in and of themselves. (How many times have you compared the translation to the original and noticed that the translator has taken poetic license and rendered a less-than literal translation?) By hitting garage sales, used book stores, and discount book stores, you can easily build a collection of lexicons without breaking your pocketbook.

When “Money is No Object”

If you happen to find yourself in the enviable position of having a generous budget for foreign credential evaluation resources, consider the following resources. Keep in mind that all of these publications were written outside of the United States, and give the evaluator an interesting, non-U.S. perspective.

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- **The Electronic Embassy:** www.embassy.org/. Address, phone, fax and Web contact for all embassies in Washington, DC.
- **Association of International Education, Japan:** www.aiej.or.jp. The searchable online version of the print resource *Japanese Colleges and Universities*. Information includes recognition status of colleges and universities, details on degree programs, admission requirements, and links to official institutional Web sites.

Now What?

It's become apparent that a good credentials evaluation library is one that is based on building blocks (basic, comprehensive resources), and grows over time (country and region-specific volumes that correspond to your international students' countries of origin). A great resource for an overview of publications currently available is the ADSEC Bibliography, online at www.nafsa.org/adsec/. Also, keep abreast of new publications by checking AACRAO's (www.aacrao.org) and NAFSA's (www.nafsa.org) Web sites periodically.

Keep adding materials as your budget permits, and remember never to discard resources that seem to be out-of-date. You never know when that 1964 volume on France might come in handy for a non-traditional-age student applying to your MBA program, for instance. Educational systems change over time, making new resources essential. But your older volumes are an important window to the past, and will be necessary more often than you might expect. If you're wondering where you can get older, out-of-print World Education Series volumes, check around your campus. Up through the mid-1980s, thanks to generous funding through the Bureau of Educational and Cultural Affairs of the U.S. Department of State (in later years by the U.S. Information Agency), AACRAO was able to publish up to three World Education Series volumes per year. A copy of each of these volumes was sent to each AACRAO member institution, and if they aren't on your bookshelf, chances are that they reside, unused, on a bookshelf somewhere on campus, or in your campus library. A little investigative work could produce some very worthwhile results.

Now that we've dispelled the Myth of the Big Book, you can get to work on building a customized library of foreign credentials evaluation resources that will equip you to accurately, consistently, and authoritatively evaluate any foreign educational credential that crosses your desk.

Book

reviews

From the Free Academy to CUNY

By Sandra Shoiack Roff, Anthony M. Cucchiara, and Barbara J. Dunlap
Fordham University Press 2000
Hardcover \$27.50
Softcover \$19.95
154 pp./122 illustrations

The subtitle of this book is “Illustrating Public Higher Education in New York City, 1847-1997” and celebrates the sesquicentennial of the City University of New York. Graduates and friends of CUNY can take pride in the lively and interesting manner in which the University is presented to the reader. The frequent and judicious use of illustrations, many taken from archival sources, helps readers to understand the institution as a living, breathing entity with a varied and storied past. Each of the illustrations is clearly identified and for some, the description is lengthy and informative and complements the text. In fact, one of the strengths of this volume is its rich collection of vintage photographs.

If the reader is looking for controversies, disputes, struggles over power and influence or other contentious issues that are the warp and woof of any major educational institution, they will not be found in detail here. For example, the influence of the political and intellectual Left in the life of City College of the 1930s, and the disappointing point shaving scandal at the school in 1951 that followed its NCAA and NIT basketball championships in 1950 are each mentioned in a few sentences.

Efforts to expand the size and scope of CUNY in the 1970s in response to changing immigration patterns and the need to expand remedial programs for the benefit of inadequately prepared students are treated briefly. An illustration that is missing and would have assisted this reviewer to better comprehend the rapid growth of CUNY in the 1960s and 70s is a chart that depicts the constituent campuses and the dates of their founding within the City University system.

The historic decision in 1976 of the Board of Higher Education, the governing body of CUNY, to authorize the

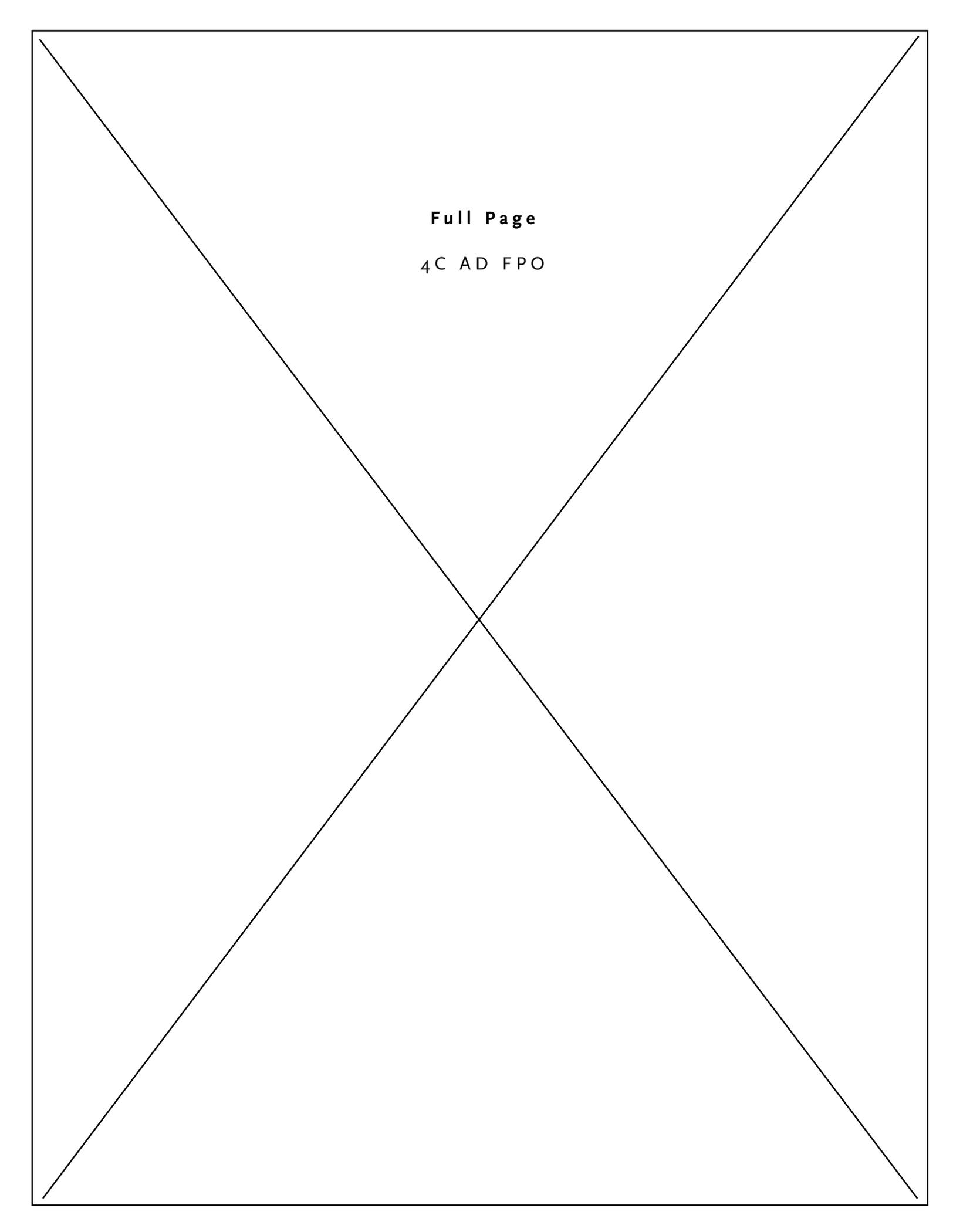
levying of tuition in exchange for financial support from the New York State Treasury was a momentous one, especially when one considers the long tradition of that institution as a “free academy.” It was coupled with a successful effort by CUNY to rebuff the efforts of Governor Nelson Rockefeller to merge it with the State University of New York (SUNY) system. These developments were very significant for the future of public higher education in the Empire State. But barely half a page is devoted to these issues.

It could be argued that a rehash of long-settled disputes and controversies is out of place in a work written to celebrate an important anniversary. That may be true. But the pages of this highly readable and handsomely produced book serve only to whet the appetite of a reader interested in exploring the colorful history of an institution like CUNY. The historical survey presented here serves the institution well as an introduction to its past. It would be interesting to see a companion volume giving the full treatment so to speak, a meaty and earthy account of CUNY’s struggles for recognition as a leading and forward-looking urban university entering the 21st century.

The work includes an extensive bibliography of books, articles and graduate theses together with the addresses and Web sites of the CUNY Colleges and the names of a sampling of well known alumni. Finally, a very thorough subject index is included for the convenience of the reader.

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