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ABSTRACT

A study investigated the appropriateness of admissions standards used for transfer students to the University of Missouri-Columbia, by analyzing the relationship between several possible predictor variables (number of transfer credits, transfer grade point average, type of previous institution, type of associate degree earned) and targeted outcomes (academic persistence and graduation rates). Data on 10,312 degree-track transfer students between fall 1983 and 1991 were compared with those on 14,351 students initially enrolled at the university in fall 1983 and/or fall 1987. Results indicated: (1) a disparity in persistence and graduation rates of native and transfer students, implying that admissions standards for transfer students should be strengthened: (2) that target persistence and graduation rates for transfers should not be based on those for comparable native students; (3) that a 1-year persistence rate of 70% and a 6-year graduation rate of 60% are appropriate for transfers; and (4) that number of transfer credits and transfer grade point average are suitable predictor variables for admission. Further analysis was undertaken to establish specific admission criteria and policy. (MSE)

Admissions Standards for Undergraduate Transfer Students:

A Policy Analysis

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Jean Endo
Editor
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Abstract

Admissions Standards for Undergraduate Transfer Students:

A Policy Analysis

This paper describes and illustrates, in the context of a single university's experience, a four-step methodology for examining standards for the admission of transfer students. Persistence and graduation rates of transfer students are compared with rates of native students matched to the transfers on the basis of credits earned. Regression analyses predicting persistence and graduation of transfer students also are carried out. In addition to credits earned, predictor variables include transfer grade point average and type of transfer institution. The rationale and analysis for developing proposed admissions requirements from the data are described.

Admissions Standards for Undergraduate Transfer Students:

A Policy Analysis

Since the early 1970s, standards for the admission of first-time freshmen to the University of Missouri-Columbia have been increased four times, including the increase in standards to become effective for the 1997 fall semester. Standards for the admission of undergraduate transfer students, however, have remained virtually unchanged over this period. This discrepancy suggested that the admissions requirements for transfer students be reviewed. The purpose of this paper is to describe the methodology used to carry out this review. The specific results of the data analyses utilized apply to the University of Missouri-Columbia. It is not intended that the results be generalized to other colleges or universities. Instead, this paper is intended to explain a methodology by which current admissions standards for transfer students can be examined and new standards for the admission of transfer students can be developed.

Currently, a student seeking to transfer to the University of Missouri-Columbia is admitted if the student's overall grade point average for all college level courses attempted at previous institutions is at least 2.0 (4.0 scale) and the student is in good academic standing. If the student has completed fewer than 24 credits of college-level work, that student must also meet the admissions standards applicable to first-time freshmen. Prior to 1987, transfer applicants who had completed fewer than 12 transfer credits were required to meet the applicable standards for first-time freshmen.

The methodology used to examine admissions standards for transfer students can be described as a four-step process. First, the specific outcomes to be used as criteria and to justify

the standards are selected (Oliver, 1979). Second, acceptable levels of the outcomes are set. Third, relationships between potential predictor variables and outcome variables are examined. Finally, admissions standards expected to lead to the desired outcomes are specified.

This methodology was applied as follows. The outcomes selected for use as criteria in justifying admissions standards are persistence and graduation rates. The initial plan was to set acceptable persistence and graduation rates for transfers at levels attained by comparable native students. This procedure turned out to be too demanding. Consequently, absolute standards for transfer-student persistence and graduation rates were adopted. Relationships between potential predictor variables (number of transfer credits, transfer grade point average, type of transfer institution and AA or AS degree earned) were studied by examining persistence and graduation rates for various categories of transfer students and by application of multiple regression analysis. Finally, results of this data analysis in combination with the target persistence and graduation rates led to alternative admissions standards.

Literature Review

There is abundant literature on the characteristics and academic success of transfer students. However, a review of this literature revealed no studies which focus specifically on analyzing or establishing criteria for the admission of transfer students. The review did identify variables which predict the academic success of transfer students and which, therefore, are candidates for inclusion in standards for their admission. One such variable is transfer grade point average (Townsend, McNerny & Arnold, 1993; Graham and Hughes, 1994). Another is number of transfer credits (Best & Gehring, 1993). Others are receipt of an Associate of Arts (AA) or

Associate of Science (AS) degree (Graham & Hughes, 1994; Keeley and House, 1993) and type of transfer institution (Holahan, Green & Kelly, 1983; Anderson, 1988).

The Data

The data on transfer students came from 10,312 degree-seeking students who transferred to the University, entering for a fall semester between fall 1983 and 1991. At the time the data were collected, one-year persistence rates could be calculated for all 10,312 students and six-year graduation rates could be calculated for the 5,443 students who entered fall 1983 to fall 1987. In addition to year of entry, whether a student enrolled for the second fall semester and whether a student graduated before the beginning of the seventh year after initial enrollment, data on number of credits transferred, transfer grade point average, degrees earned prior to transfer and type of transfer institution were recorded.

The data on native students came from 14,351 students who initially enrolled at MU as degree-seeking, first-time freshmen (excluding international students), who were enrolled as undergraduates for the fall 1983 or fall 1987 semester and who met the test score and class rank admission standard for first-time freshmen to become effective fall 1997. A student who was enrolled for both the fall 1983 and fall 1987 semesters was treated as a fall 1983 and not a fall 1987 student. Native students who meet admissions standards for first-time freshmen to become effective fall 1997 were selected, because it was felt this would be the relevant comparison population for examining policies for the admission of future transfer students. In addition to the basic data on one-year persistence and six-year graduation, the number of credits earned prior to fall 1993 or fall 1987, as appropriate, was recorded. Number of credits earned was used to match groups of native students to groups of transfers. Cumulative grade point average for native

students was not used as a matching variable; the native students had met freshman admissions standards and their grade point averages were considered irrelevant to the comparisons to be made.

Results

Step One

As previously indicated, the outcomes selected for use as criteria in justifying admissions standards are persistence and graduation rates. Specifically, one-year persistence and six-year graduation rates were identified as the criteria of academic progress and success against which transfer admissions standards would be tested. The admissions standards would be appropriate if admitted transfer students exhibit acceptable one-year persistence and/or six-year graduation rates. One-year persistence is defined as enrollment for the second fall semester or graduation before the beginning of that semester. Six-year graduation means earning a bachelor's degree any time prior to the seventh fall semester, counting the term of initial enrollment as the first.

Step Two

The initial attempt to set target levels of one-year persistence and six-year graduation rates involved a comparison of persistence and graduation rates for transfer students and for native students who meet test score and class rank admissions to become effective fall 1997. Rates for native and transfer students by number of credits earned or transferred are shown in Table 1.[1] For a native student, credits earned is the total number of credits earned prior to fall 1983 or fall 1987, depending upon the term for which the student was selected. For a transfer student, credits earned is the number of credits accepted by the University at the time of transfer.

Table 1. One-Year Persistence and Six-Year Graduation Rates for Native and Transfer Students by Number of Credits Earned

Number of Credits Earned[a]	One-Year Persistence				Six-Year Graduation			
	Native Students		Transfer Students		Native Students		Transfer Students	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
75 & Over	2,927	0.93	1,461	0.73	2,927	0.95	745	0.65
60 - 74	1,667	0.91	2,229	0.74	1,667	0.91	1,162	0.65
45 - 59	1,447	0.89	1,747	0.67	1,447	0.82	890	0.57
30 - 44	2,339	0.88	2,364	0.72	2,339	0.80	1,253	0.55
24 - 29	1,188	0.80	1,378	0.65	1,188	0.68	654	0.45
0 - 23	4,783	0.82	1,133	0.58	4,783	0.63	739	0.31
Totals	14,351	0.87	10,312	0.70	14,351	0.78	5,443	0.54

[a]Credits transferred for transfer students.

The persistence and graduation rates for native students are considerably higher those for transfers.[2] No transfer student persistence rate is as high as the lowest native student rate and the graduation rates for transfers with 60 or more transfer credits are comparable to the rates for native students with fewer than 30 credits earned. These large differences suggest that it would be essentially impossible to develop admissions standards for transfer students that would lead to persistence and graduation rates comparable to those of native students. This implication was verified by the data in Table 2 which contains rates for transfers by credits transferred and transfer grade point average. Even those transfer students whose transfer grade point average is 3.50 or higher do not attain persistence and graduation rates which are comparable to those of native students.

The conclusion is that target persistence and graduation rates can not be derived from the rates for comparable native students. Partially on the basis of the rates in Tables 1 and 2, a target one-year persistence rate of .70 and a target six-year graduation rate of .60 were adopted. In

other words, the position adopted was that to be admissible a transfer student should have a .70 probability of persisting to a second year or a .60 probability of graduating within six years.

Table 2. One-Year Persistence and Six-Year Graduation Rates for Transfer Students by Number of Credits Earned and Transfer Grade Point Average

A. One-Year Persistence

Number of Credits Transferred	Transfer Grade Point Average 0.00 - 1.99[a]	2.00- 2.49	2.50- 2.99	3.00- 3.49	3.50- 4.00	All
75 & Over	0.68	0.68	0.71	0.78	0.78	0.73
60 - 74	0.55	0.67	0.70	0.80	0.84	0.74
45 - 59	0.45	0.62	0.68	0.75	0.75	0.67
30 - 44	0.56	0.62	0.71	0.79	0.82	0.72
24 - 29	0.69	0.56	0.65	0.75	0.82	0.65
01 - 23	0.45	0.52	0.57	0.60	0.71	0.58
All	0.55	0.61	0.68	0.76	0.80	0.70

[a]N's for the individual cells in this column range from 22 to 42.

B. Six-Year Graduation

Number of Credits Transferred	Transfer Grade Point Average 0.00- 1.99[a]	2.00- 2.49	2.50- 2.99	3.00- 3.49	3.50- 4.00	All
75 & Over	0.58	0.55	0.65	0.70	0.76	0.65
60 - 74	0.22	0.50	0.57	0.76	0.78	0.65
45 - 59	0.23	0.45	0.58	0.71	0.71	0.57
30 - 44	0.24	0.38	0.55	0.63	0.69	0.55
24 - 29	0.25	0.35	0.47	0.54	0.65	0.45
01 - 23	0.09	0.21	0.32	0.34	0.53	0.31
All	0.25	0.40	0.54	0.64	0.70	0.54

[a]N's for the individual cells in this column range from 9 to 22.

Step Three

The literature review suggested that standards for the admission of transfer students be based upon number of transfer credits, transfer grade point average, type of transfer institution and whether the student had earned an AA or AS degree. Standards based upon such variables would be appropriate if they are able to predict the outcome criteria variables, persistence and graduation. Relationships between predictor and outcome variables were studied in two ways. First, persistence and graduation rates for categories of the predictor variables were examined. Second, the multiple regression relationships between predictor and outcome variables were estimated. Although the two approaches are somewhat redundant, they do provide two views of the relationship of potential admissions-criteria variables to the persistence and graduation outcome variables.

The persistence and graduation rates in Table 2 provide the first view of the relationships between number of transfer credits and transfer grade point average and the two outcome variables. Clearly there is a positive relationship between each predictor variable and each outcome measure. The relationships are greater when the predictor variables are considered together.

Persistence and graduation rates by type of transfer institution and, for two-year institutions, by whether the student earned an AA or AS degree are shown in Table 3. In this table a distinction is made between the other three campuses of the University of Missouri system and other public four-year institutions. It is possible that a policy on the admission of transfer students should include special provision for students of the other three campuses of the four-campus system.

Table 3. One-Year Persistence and Six-Year Graduation Rates for Transfer Students by Type of Transfer Institution and Prior Degree

Type of Transfer Institution and Prior Degree	Persistence		Graduation	
	Number	Rate	Number	Rate
Public Two-Year-A[a]	3,634	0.67	1,932	0.49
Public Two-Year-B[a]	555	0.69	288	0.55
Other UM System	1,180	0.73	728	0.60
Other Public Four-Year	3,146	0.73	1,554	0.60
All Public	8,515	0.70	4,502	0.55
Private Two-Year-A[a]	86	0.65	41	0.39
Private Two-Year-B[a]	36	0.56	24	0.50
Private Four-Year	1,675	0.67	876	0.54
All Private	1,797	0.67	941	0.53
All Two-Year-A[a]	3,720	0.67	1,973	0.48
All Two-Year-B[a]	591	0.68	312	0.55
All Four-Year	6,001	0.71	3,158	0.58
All Institutions	10,312	0.70	5,443	0.54

[a]Two-Year-A, Students without AA or AS degrees
Two-Year-B, Students with AA or AS degrees

Persistence and graduation rates for students from four-year colleges and universities are higher than the rates for those from two-year colleges and the rates for public institutions are higher than those for private institutions. These differences are small, but an examination of the rates by number of transfer credits and transfer grade point average, as well as institution type, shows that the differences in rates can not be attributed to differences in numbers of transfer credits or transfer grade point average.

Multiple regression also was used to examine the relationships between the predictor and outcome variables. Initially, two multiple regressions were estimated. The dependent variable for the first was persistence to the second year ("1" if the student was enrolled for the second year or

had graduated before then and "0" otherwise). The dependent variable for the second regression was graduated by the end of the sixth year ("1" if the student had graduated before the beginning of the seventh year and "0" otherwise). The independent variables for each regression were number of transfer credits, transfer grade point average, transfer institution control ("1" if the student transferred from a public college or university and "2" if from a private one), two-year with AA or AS degree ("1" if student transferred from a two-year college with an AA or AS degree and "0" otherwise) and four-year transfer institution ("1" if the student transferred from a four-year college or university and "0" otherwise).[3]

Bivariate correlations of the predictor variables with the outcome variables are included in Table 4. These correlations are modest or non-significant. The correlations with six-year graduation are typically higher than those with one-year retention. The correlations among the predictor variables are not shown in the table; most are less than .10. The following are greater than .10. The correlation of .22 between transfer credits and two-year with AA or AS probably reflects the fact that a student must have at lest 60 credits to earn an AA or AS degree; the correlation of .33 between control and four-year probably reflects the fact that most two-year colleges are public; and the correlation of -.29 between two-year with AA or AS and four-year probably reflects the definitional dependence of these two variables.

The two multiple correlations, using five predictor variables, were modest. The correlation for six-year graduation, .31, is higher than the correlation for one-year persistence, .17. Because of the low correlations among the predictor variables, the standardized regression estimates for these variables were nearly identical to their bivariate correlations with the criterion variables. The best predictor of both persistence and graduation was transfer GPA. Transfer

credits was the second best predictor, except that when predicting persistence, the standardized estimates for control and four-year were essentially the same as the estimate for transfer credits.

Table 4. Multiple Regression Analyses for Predicting One-Year Retention and Six-Year Graduation

Data	Independent Variable	Persistence	Graduation
Bivariate Correlations[a]	Transfer Credits	0.06	0.18
	Transfer GPA	0.15	0.24
	Control	-0.03	--[c]
	Two-Year With AA or AS	--[c]	--[c]
	Four-Year	0.04	0.09
Five Predictor Variables [a]			
Multiple R		0.17	0.31
Regression Estimates	Intercept	0.33	-0.21
	Transfer Credits	0.00	0.00
	Transfer GPA	0.13	0.21
	Control	-0.06	-0.05
	Two-Year With AA or AS	--[c]	-0.08
	Four-Year	0.05	0.08
Standardized Estimates	Transfer Credits	0.05	0.17
	Transfer GPA	0.15	0.23
	Control	-0.05	-0.04
	Two-Year With AA or AS	--[c]	-0.04
	Four-Year	0.05	0.08
Two Predictor Variables [b]			
Multiple R		0.16	0.29
Regression Estimates	Intercept	0.28	-0.21
	Transfer Credits	0.00	0.00
	Transfer GPA	0.13	0.21
Standardized Estimates	Transfer Credits	0.05	0.17
	Transfer GPA	0.15	0.23

[a]N's, 10,314 for persistence analyses, 5,444 for graduation analyses.
[b]N's, 10,339 for persistence analyses, 5,456 for graduation analyses.
[c]Statistic not significant at .05 level.

In an attempt to simplify the regression models, two-predictor-variable models were estimated. Transfer credits and transfer GPA were the predictor variables used. Results are in Table 4. When the three predictor variables which made the smallest contributions to predicting persistence and graduation were removed from the regression models the multiple correlations declined very little. The two-variable models are quite satisfactory substitutes for the five-variable models.

Standard regression often is not used when the dependent variable is dichotomous. Logistic regression is typically recommended for this situation. Consequently, the logistic procedure was applied to the two-predictor variable data. Results of the standard and logistic regression analyses are quite similar. The logistic correlations, .14 and .25, are similar to the standard regression values, .16 and .29, and the results of carrying out the step-four data analyses using the logistic regression results are nearly identical to the results using standard regression.

Step Four

Several conclusions are suggested by the findings of the data analyses of the prior steps. First, the appreciable disparity in persistence and graduation rates between transfer and native students implies that admission standards for transfer students should be strengthened. Second, the magnitude of this disparity leads to the conclusion that target persistence and graduation rates for transfer students can not be based upon rates for comparable native students. Third, a one-year persistence rate of .70 and a six-year graduation rate of .60 are appropriate expectations for transfers to the University of Missouri-Columbia. Fourth, number of transfer credits and transfer grade point average are suitable predictor variables on which to base transfer admissions

standards. What remains is to develop, from the data, specific standards to be proposed to the University's governing board.

Two approaches were used to derive potential standards. The persistence and graduation rates of Table 2 provided the first basis for the development of potential standards. The multiple regression results provided the second.

In the first approach, the rates of Table 2 were smoothed by calculating means of four adjacent cells. This produced the estimates of the rates for discrete numbers of transfer credits and discrete values of transfer grade point average which are shown in Table 5. For example the rate of .80 in the upper right hand corner of the persistence portion of Table 5 was calculated as the unweighted average of .78, .78, .80 and .84, values in the upper right hand corner of the persistence portion of Table 2.

Table 5. Smoothed One-Year Persistence and Six-Year Graduation Rates

A. Persistence

Transfer Credits	GPA 2.00	2.50	3.00	3.50
75	0.65	0.69	0.75	0.80
60	0.58	0.67	0.73	0.79
45	0.58	0.66	0.73	0.78
30	0.59	0.62	0.70	0.76

B. Graduation

Transfer Credits	G.P.A. 2.00	2.50	3.00	3.50
75	0.49	0.57	0.67	0.75
60	0.38	0.53	0.66	0.74
45	0.37	0.49	0.62	0.69
30	0.30	0.40	0.50	0.58

Before the smoothed rates were calculated, the rates for the 24 - 29 and 1 - 23 transfer-credit ranges were combined to form (rows of) rates for a 1 - 29 credit range. The rates for the 1 - 29 range, rather than those for the 23 - 29 range, were used in calculating the smoothed rates. Similarly, the 2.00 - 2.49 and 2.50 - 2.99 grade-point-average ranges were combined to form

(columns of) rates for the 2.00 - 2.99 range. In calculating smoothed values the rates for the 2.00 - 2.99 range, rather than the 2.00 - 2.49 range were used.

The rates in Table 5 do not provide definitive combinations of transfer credits and transfer grade point average leading to the target values of .70 for persistence and .60 for graduation. However, the following combinations of transfer credits and transfer grade point average are suggested by the data as constituting a reasonable basis for stating minimum standards:

Combinations Derived from Smoothed Rates

Transfer Credits	Transfer Grade Point Average: Persistence Criterion	Transfer Grade Point Average: Graduation Criterion
75	2.50	2.50
60	2.75	2.75
45	2.75	3.00
30	3.00	3.50

Using the first pair of values, the admissions standards might read as follows: If the transfer applicant presented 75 or more transfer credits, then to be admissible the student's transfer grade point average must be 2.50 or higher. Of course, a choice between the persistence and graduation outcome would be required to state definitive standards. The rounded values of transfer credits and grade point averages are suggested for purposes of clarity in publicizing and implementing the standards.

The results of the multiple regression analyses provide the basis for the second approach to deriving potential admissions standards. The two regression equations are:

PP = .284541 +.000865*TC + .129683*TGPA and

PG = -.216749 +.003289*TC + .211948*TGPA,

where PP is predicted persistence rate, PG is predicted graduation rate, TC is number of transfer credits and TGPA is transfer grade point average. Rearranging these equations and substituting the target values of .70 for persistence and .60 for graduation yields:

TGPA = (.70 - .284541 - (.000865*TC))/.129683 and

TGPA = (.60 + .216749 - (.003289*TC))/.211948.

Solving these equations for selected values of number of transfer credits, the following combinations of transfer credits and transfer grade point average provide potential values for a transfer admissions policy:

Combinations Derived from Multiple Regression Results

	Transfer Grade Point Average	
Transfer Credits	Persistence Criterion	Graduation Criterion
75	2.70	2.70
60	2.80	2.90
45	2.90	3.20
30	3.00	3.40

The smoothed persistence and graduation rates and the results of the regression analysis do not produce identical implications for transfer admissions standards. Also, the implications of the target one-year persistence and six-year graduation rates differ. Some choices among the alternatives along with other considerations are required in order to derive admissions standards from these results.

Discussion

In the college or university setting, the data analysis does not produce the policy, in this case, the new admissions standards for transfer students. Rather, the data analysis and its

implications are presented to the policy makers who may bring to bear considerations other than the data in generating the policy. Actually, the selection of the relevant outcomes and the choice of target levels of the outcomes are policy decisions that are not made in isolation by the analyst. In the present case the selection of retention and graduation as the outcomes to serve as criteria for the development of potential admissions standards was based upon clearly stated positions of university leadership regarding the admission of first-time freshmen. Consequently, these outcomes could be specified without explicit guidance from policy makers.

As a matter of fact, the decision to reject the native student with transfer student comparisons as the basis for setting the target levels of the two outcome variables was a policy decision, but one that was clearly implied by the data. The choices of .70 and .60 as target levels of the two outcome variables were made by the analysts, because these parameters were required for the data analysis. These levels are, however, unarguably reasonable ones based upon the actual persistence and graduation rates of the transfer students studied.

Finally, the reconciliation of the varying implications of the data analysis or the choice of one of them is a matter of policy. The following considerations might be brought to bear in converting the results of the data analysis into policy on admissions standards. (1) The fact that the multiple correlation for predicting six-year graduation is higher than the one for one-year retention suggests that more weight be given to the graduation criterion and results. (2) Noting that the current transfer admission standard is, basically, a 2.00 transfer grade point average, any standard derived from the data will have an appreciable impact on transfer student applicants. This fact suggests that the new standards be set conservatively; that where choices among implications of the data are made the least demanding standard should be selected. (3) The need

to communicate and implement any new admissions standards for transfer students, suggests that the standards be stated in as simple and straightforward manner as possible.

An earlier version of this paper was presented to a faculty body, the members of which had responsibilities for advising transfer applicants and for monitoring the academic progress of undergraduate students in the several schools and colleges at the University of Missouri-Columbia. The data analysis for the fourth step of the methodology presented in the earlier paper was more open ended than that of the present paper. After deliberation, that faculty body recommended that the admissions policy for transfer undergraduates be changed and include the provisions that to be admissible (a) the transfer applicant with 60 or more transfer credits must have a transfer grade point average of at least 2.50 and (b) the applicant with 30 to 59 transfer credits must have a transfer grade point average of at least 2.75. These recommendations were endorsed by the University's principal faculty deliberative body and recommended by that body to the Chancellor who accepted them and recommended them to the President of the four-campus University of Missouri System.[4]

An application of the considerations of conservativeness and simplicity, would allow the standards recommended by the faculty bodies and chancellor to be derived form the results of the step-four data analysis.

NOTES

1. In Table 1 the intervals for number of credits earned are not uniform, because a comparison of persistence and graduation rates for the 24 - 29 and 1 - 23 credit ranges is of interest.

2. The question of whether the overall persistence and graduation rates of native and transfer students are comparable, due to differences in the compositions of the two groups by numbers of credits earned, was examined by weighting native student rates by transfer student numbers in the several categories of credits earned. It turned out that the resulting adjustments to overall rates for native students were negligible.

3. A predictor variable to identify students who transferred from two-year colleges without an AA or AS degree was not created. This variable would have been redundant given the other two institution-level variables.

4. The full policy recommendation included a number of other provisions, most of which are unique to the situation at the University of Missouri-Columbia and are not derived directly from the process described in this paper.

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