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ACADEMIC PERFORMANCE OF TRANSFER VERSUS "NATIVE" STUDENTS IN NATURAL RESOURCES & SCIENCES

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Transfer students comprise a substantial component of the student body in many 4-year academic colleges, but the factors affecting students' success once they have transferred are poorly understood. Using data from standard university records, academic performance was examined for 2,467 students enrolled in natural resource majors at a mid-sized public West Coast university with a reputation for an emphasis on natural resources and sciences. Contrary to other studies, no statistical evidence was found for a difference in the performance of native and transfer students: both raw GPA and GPA adjusted for precollege variables were statistically indistinguishable between the two groups of students. Two hypotheses for the lack of difference in performance are offered. First, small class sizes at the university studied may facilitate a greater a sense of social security and thereby ease the adjustment for transfer students to their new schools. Second, the geographical isolation may encourage transfer students to remain near the campus community, which could usher more rapid assimilation into the academic community. A better understanding of the factors that elevate and alleviate transfer shock will help academic administrators, counselors, and teachers better ensure the success of transfer students.

Transfer students comprise a substantial component of the student body in many 4-year academic colleges and universities in the U.S. (Holohan, Green & Kelley, 1983), and approximately 20% of students in community or technical colleges will transfer to 4-year institutions (Grubb, 1991). While much research has focused on a long-term decline in community college transfer rates, factors affecting students' success once they have transferred have been less emphasized (Laanan, 2001). Transfer students face a variety of academic, social, and intellectual climate issues while acclimating to their new schools (Eggleston & Laanan, 2001), and this can lead to a tendency for transfer students to under perform academically relative to "native" students who matriculate at their academic institution for their first two, and subsequent, years. When investigated empirically, this tendency has varied considerably across institutions and states with different community college educational practices (Holohan & Kelley, 1983; Kitnzer & Wattenbarger, 1985).

This report provides data on the academic performance of 2,467 students enrolled in natural resource majors at a mid-sized public West Coast university. Most other analyses have been campus-wide or focused on social sciences humanities (Laanan, 2001), perhaps reflecting the emphases of their authors.

Only one other analysis has focused on students in natural sciences (Ditchkoff, Laband & Hanby, in press). I conclude the note by offering two testable hypotheses for the difference, or lack thereof, in performance of transfer and native students.

Method

Participants and Setting

Data were obtained on academic performance of 2,467 students who graduated with a Bachelor of Science from 16 majors within the college of natural resources and sciences at Humboldt State University during the 12-year period of 1992-2003 (Table 1). Humboldt State is located in a largely rural county in Northwestern California, and it has a reputation for an emphasis on natural resources and sciences. Although several departments made slight curricular changes over these years, this time span was chosen because the university requirements remained largely consistent and the inclusion of a lengthy period substantially increased the sample size and statistical power. The university's Office of Academic Affairs provided all the data.

Procedure

The students' graduating grade-point-average (GPA) was used as a measure of academic performance. Values were calculated on a 4-point scale from all graded courses taken at the university. Grade-point-average is an imperfect measure of academic performance because it reflects an unknown mixture of study skills, test-taking skills, motivation, raw intelligence, commitment to academic versus other life pursuits, etc. (Mouw & Khanna, 1993). Nonetheless, it is a standard metric for academic performance (Mathiasen, 1984), and was assumed to serve as an index of performance in the absence of an available better alternative.

Variation in GPA is partially explained by precollege characteristics, most notably SAT (or ACT) score, high school GPA, and student age (Mathiasen, 1984), though personality traits may also explain residual variation (Bauer & Liang, 2003). Therefore, to compare the difference in performance between transfer and native students per se, precollege characteristics must be accounted for statistically. High school GPA (calculated on a 4-point scale), age at graduation, and SAT/ACT scores, all obtained via admissions records, were used as covariates. Standard ACT scores were converted to SAT equivalents for students who reported only the former (conversion tables from the College Board, 2003); SAT score was used for students who reported both. Many transfer students did not report any test scores, so these students were examined with a separate analysis (see below). States differ in their transfer guidelines and thus state residency could explain some variation in transfer students' performance (Grubb 1991), so state residency (in-state or out-of-state) was also included as a variable in the analyses.

Data Analysis

Analysis of variance (ANOVA) and analysis of covariance (ANCOVA) were used to examine effects of nominal and

continuous variables on academic performance (GPA). GPA was normally distributed and all assumptions of ANOVA/ANCOVA were met. All analyses were run with the general linear model component of SPSS 10.0.

First, the 'raw' academic performance of students was examined without statistically accounting for precollege variables (i.e., age, SAT score, high school GPA, and age). In this ANOVA, transfer status (transfer or native) and residency (in-state or out-of-state) were factors and university GPA was the dependent variable.

Next, the 'adjusted' academic performance of students was examined while statistically accounting for precollege variables. In this ANCOVA, transfer status and residency were factors; SAT score, high school GPA, and age were covariates; university GPA was the dependent variable.

Most native students report ACT or SAT scores to gain admittance to the university, but community colleges rarely require such scores, and the university does not require scores for students to transfer. Consequently, the above analyses only included native students and those transfer students who reported such scores (n = 993). However, if the transfer students who did not report test scores differ in academic performance from those who do, the absence of the former from analyses could bias my results. To account for this, the data were parsed to include only transfer students and I determined whether there was a difference in raw or adjusted GPA between students who did and did not report SAT or ACT scores.

Results

In the analysis of raw academic performance, i.e., GPA not adjusted for precollege variables, there was no evidence for a difference in the performance of native and transfer students (Figure 1, Table 2). Out-of-state students had raw GPAs that were on average 0.16 points higher than state residents' raw GPAs (Figure 1, Table 2).

There was strong evidence for a positive relationship between students' university academic performance and precollege measures of performance: SAT score (or ACT equivalent) and high school GPA were both highly significant predictors of university GPA, and age was weakly positively associated (Table 2). After statistically accounting for these precollege variables (i.e., comparing adjusted GPAs via ANCOVA), the residency difference diminished to 0.06 grade points and was no longer statistically significant (Table 2, Figure 1). Like with the raw analysis, native and transfer students again had statistically indistinguishable adjusted GPAs.

In the analysis of transfer students only, those that reported SAT or ACT scores did not differ in raw or adjusted GPA from those that did not (Table 3). As before, raw GPAs for out-of-state transfers were higher than for state residents (by an average of 0.03 grade points), but this difference disappeared once effects of high school GPA and graduation age were statistically controlled via ANCOVA (Table 3, Figure 2). Both high school GPA and age were again significant positive predictors of transfer students' university GPAs (Table 3).

Discussion

Approximately two thirds of the studies published on native vs. transfer student performance have reported that native students obtain the better grades (see references in Hills, 1965; Holohan et al., 1983; Laanan, 2001; but see Ditchkoff et al., in press). This difference is typically attributed ad hoc to social and academic challenges unique to transfer students (Eggleston and Laanan, 2001).

In this analysis, no statistical evidence was found for a difference in the performance of native and transfer students: both raw GPA and GPA adjusted for precollege variables were statistically indistinguishable between the two groups of students. Two testable hypotheses may explain why there was no difference in this case, and they may also help explain general variation in transfer vs. native student performance among institutions, programs, and geographic regions.

First, small class sizes may facilitate a greater a sense of social security and thereby ease the adjustment for transfer students to their new schools. This reasoning is based on a social explanation for variation in so-called "transfer-shock", and is explained in more detail in Laanan (2001). This explanation may apply in the present case for three reasons. First, class sizes at this university are comparatively small (average student to faculty ratio less than 24:1). Second, the difference in transfer vs. native student GPAs within the university was largest in programs with relatively large class sizes (MDJ, unpubl. data). Third, natural science programs usually have numerous extended-hour laboratory and field trip sessions in which students may become better acquainted with their peers during hands-on training than they might in programs with an emphasis on lectures and in-class discussions (Ditchkoff et al., in press).

Another explanation for variation in transfer vs. native student performance among institutions may relate to their geographic connection or isolation. Students attending schools within large urban centers and/or along easy transportation routes may seek social connection away from the campus community. They may also elect to maintain social and entertainment pursuits within their pre-transfer communities rather than investing in establishing new connections nearer their new campus' environments. In contrast, students attending comparatively more isolated schools (in geography and/or culture) have fewer alternatives and thus may be more likely to develop connections within their new communities, which likely help ease transfer shock (Laanan, 2001). The university in this study is notoriously isolated, and most students stay in the area on weekends and during shorter academic breaks, becoming involved in local pursuits with classmates and community members.

Both of these hypotheses are testable with university admissions and records data. A simple approach to partially control the myriad confounding variables is to restrict the analysis to schools within a university system that share common transfer and admittance parameters, such as a large state-wide university system. In turn, a better understanding of the factors that elevate and alleviate transfer shock will help academic administrators, counselors, and teachers better ensure the success of

transfer students.

The finding that out-of-state students outperformed in-state students disappeared once pre-college differences were statistically controlled. This result suggests that residency does not affect student performance at the University, but applicants seeking admission from out-of-state may be more motivated and/or have stronger study skills.

References

Bauer, K. W., & Liang, Q. (2003). The effect of personality and precollege characteristics on first-year activities and academic performance. *Journal of College Student Development, 44*, 277-290.

College Board (The). (2003). *SAT ACT score comparison*. [On-Line]. Retrieved 25 December from http://www.collegeboard. com/prod_downloads/about/news_info/cbsenior/yr2002/pdf/ten.pdf.

Ditchkoff, S. S., Laband, D. N., & Hanby, K. (in press). Academic performance of transfer versus native students in a wildlife sciences BS program. *Wildlife Society Bulletin*.

Eggleston, L. E., & Laanan, F.S. (2001). Making the transition to the senior institution. *New Directions for Community Colleges, 114*, 87-97.

Grubb, W. N. (1991). The decline of community college transfer rates. *Journal of Higher Education, 62*, 194-222.

Hills, J. R. (1965). Transfer shock: The academic performance of the junior college transfer. *Journal of Experimental Education, 33*, 201-215.

Holohan, C. K. & Kelley, H. P. (1978). The relationship of the characteristics of entering transfer students and their previous colleges to their attitudes and performance. *Education Research Quarterly, 3*, 58-66.

Holohan, C. K., Green, J. L., & Kelley, H. P. (1983). A 6-year longitudinal analysis of transfer student performance and retention. *Journal of College Student Personnel, 24*, 305-310.

Kitnzer, F., & Wattenbarger, J. (1985). *The articulation/transfer phenomenon: patterns and directions*. American Association of Community and Junior Colleges, Washington, D. C.

Laanan, F. S. (2001). Transfer student adjustment. *New Directions for Community Colleges, 114*, 5-13.

Mathiasen, R. E. (1984). Predicting college academic achievement: A research review. *College Student Journal, 18*, 380-386.

Mouw, J. T., & Khanna, R. K. (1993). Prediction of academic success: A review of the literature and some recommendations. *College Student Journal, 27*, 328-336.

Table 1
Natural resource and science majors used in analyses, with sample sizes of graduates from 1992-2003.

Major Name	Number of students
Biology	678
Biometrics	42
Botany	114
Chemistry	31
Computer Science	17
Environmental Science	232
Fisheries Biology	86
Forestry	267
Natural Resource Planning & Interpretation	124
Natural Resources	128
Oceanography	35
Physics	32
Rangeland Resource Science	39
Soil Science	45
Wildlife	424
Zoology	173

Table 2

Comparisons of GPA among transfer, native, state resident, and out-of-state students graduating from natural resource & science majors, 1992-2003. 'Raw' GPA was examined with ANOVA, and GPA was 'adjusted' for precollege covariates with ANCOVA. Means and variation are reported in Figure 1.

Source	df	β±1 SE	*F*	*P*
ANOVA: raw GPA, $n = 2467$				
Model	3		7.07	<0.001
Intercept	1	3.116±0.044	20566	<0.001
Main effects				
Transfer status ('native' or transfer)	1	0.045±0.082	1.40	0.236
Residency (in- or out-of-state)	1	-0.152±0.046	13.15	<0.001
Interactions				
Transfer × Residency	1	-0.007±0.086	0.01	0.939
Error	2463			
Total	2467			
ANCOVA: adjusted GPA, $n = 993$				
Model	6		63.60	<0.001
Intercept	1	0.671±0.185	13.56	<0.001
Covariates				
SAT score (or ACT equivalent)	1	0.0011±0.0001	139.45	<0.001
High school GPA	1	0.304±0.027	123.13	<0.001
Age at graduation (years)	1	0.010±0.005	4.02	0.045
Main effects				
Transfer status ('native' or transfer)	1	0.017±0.081	0.01	0.919
Residency (in- or out-of-state)	1	-0.047±0.058	1.94	0.164
Interactions				
Transfer × Residency	1	-0.025±0.085	0.08	0.773
Error	986			
Total	993			

Table 3

Comparisons of GPA among transfer students who did and did not report SAT or ACT scores, state residents, and out-of-state students graduating from natural resource & science majors 1992-2003. 'Raw' GPA was examined with ANOVA, and GPA was 'adjusted' for precollege covariates with ANCOVA. Means and variation is reported in Figure 2.

Source	df	β±1 SE	*F*	*P*
ANOVA: raw GPA, $n = 1900$				
Model	3		4.76	0.003
Intercept	1	3.122±0.062	16752	<0.001
Main effects				
SAT/ACT score presence or absence	1	-0.012±0.091	0.42	0.519
Residency (in- or out-of-state)	1	-0.121±0.066	8.78	0.003
Interactions				
Transfer × Residency	1	-0.037±0.094	0.15	0.690
Error	1896			
Total	1900			
ANCOVA: adjusted GPA, $n = 1404$				
Model	5		38.36	<0.001
Intercept	1	1.857±0.125	265.53	<0.001
Covariates				
High school GPA	1	0.313±0.023	181.98	<0.001
Age at graduation (years)	1	0.097±0.003	12.73	<0.001
Main effects				
SAT/ACT score presence or absence	1	-0.011±0.104	0.05	0.827
Residency (in- or out-of-state)	1	-0.106±0.066	2.45	0.118
Interactions				
Transfer × Residency	1	0.045±0.107	0.18	0.670
Error	1398			
Total	1404			

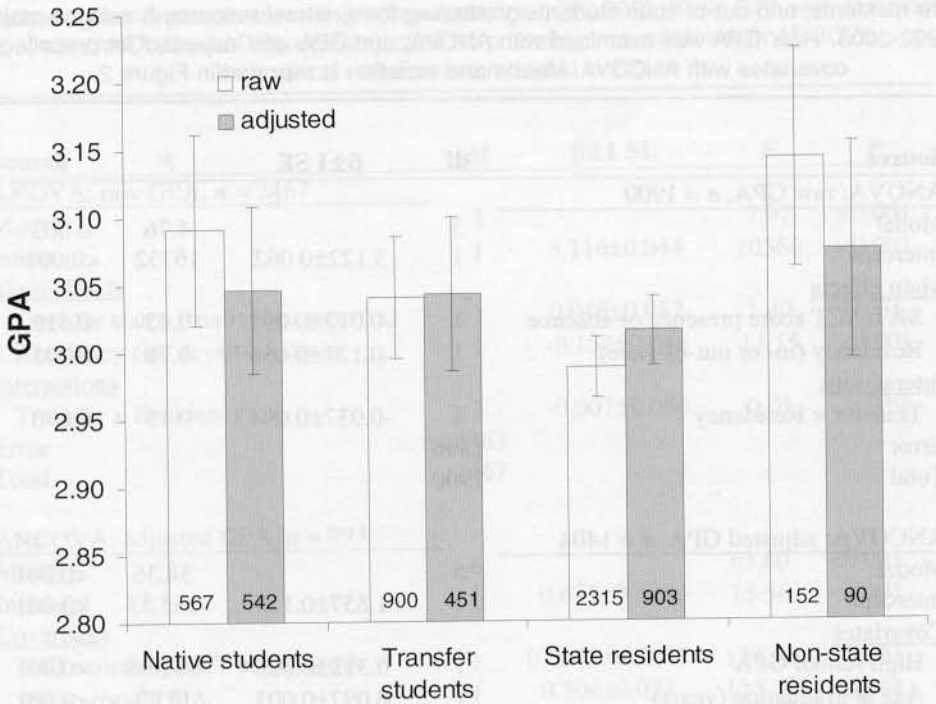

Figure 1. Mean raw GPA and GPA adjusted for 3 precollege variables (SAT score, high school GPA, and age at graduation) for students graduating from natural resource & science majors. Whiskers denote 95% confidence intervals; numbers indicate the number of students in each group. Adjusted GPA was evaluated at an SAT score of 1091.50, high school GPA of 3.26, and graduation age of 23.91 years.

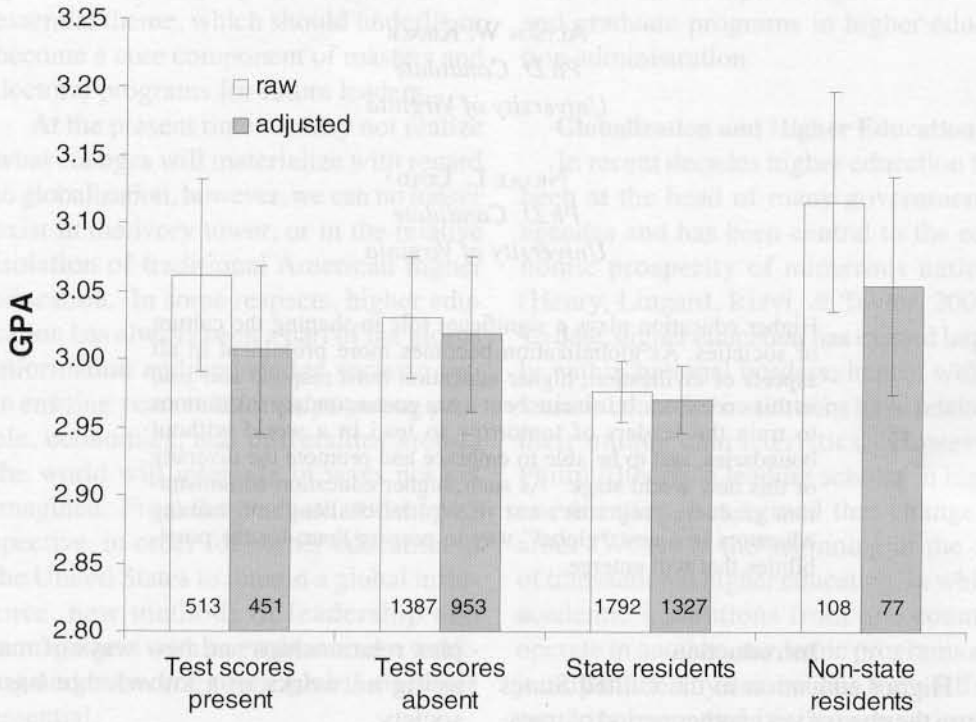

Figure 2. Mean raw GPA and GPA adjusted for 2 precollege variables (high school GPA, and age at graduation) for transfer students graduating from natural resource & science majors. Whiskers denote 95% confidence intervals' numbers indicate number of students in each group. Adjusted GPA was evaluated at a high school GPA of 3.03 and graduation age of 26.38 years.