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ACADEMIC DESCRIPTION AND PREDICTION IN JUNIOR COLLEGES

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Summary

This investigation of the junior college examines the academic potential and college grades of junior college freshmen, reports the predictive validity of ACT data for junior colleges, and compares the results for 85 junior colleges with those for 205 four-year colleges. Junior college students were found to be somewhat less able academically than their peers in four-year colleges. Their average ACT scores differed by about one-half a standard deviation, while their high school grades were about one-third of a grade point apart. However, differences among junior colleges in academic potential were so great that the least able students in one junior college would be well above average in another. Similarly, the average academic potential at several junior colleges was well above the average in typical four-year institutions.

Students within individual junior colleges had more diverse academic talents than was typical of students in four-year institutions. College grades for junior college students were also more variable than those found in four-year colleges. However, grade point averages in both junior colleges and four-year colleges were quite similar (about a "C").

For the junior colleges in this study, ACT data possessed a very satisfactory degree of predictive validity. The median correlation with overall freshman grades was .64. In specific courses in English, mathematics, social studies, and natural science, median correlations were

Academic Description and Prediction in Junior Colleges

Donald P. Hoyt and Leo Munday[1]

The junior college represents one of the most important solutions to America's need for post-high school educational opportunities. Long a factor in American higher education, the junior college has only recently assumed its key role. Some of the forces producing this new importance are reviewed in the synthesis by Blocker, Plummer, and Richardson (1965).

The heavy responsibilities that junior colleges carry require that they have a thorough understanding of their students, goals, methods, and outcomes. Because they have only recently emerged as a major element in higher education, a limited amount of research data has been accumulated to foster these understandings. This report, which seeks to provide some additional information gathered through the Research Services of the American College Testing Program, explores the following questions:

1. How do the academic potentials of junior college freshmen compare with those of freshmen attending four-year colleges?
2. How much diversity in academic potential is there among junior colleges compared with four-year colleges?
3. What grading practices characterize junior colleges?

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[1]The assistance of Larry Braskamp is gratefully acknowledged.

Table 1

Description of Junior Colleges Studied

Geographic Region	Number of Schools
West Coast (Cal., Ore., Wash.)	4
South (Ala., Ark., Fla., Ky., Miss., Tenn.)	11
Midwest (Ill., Ia., Minn., Ohio, Wis.)	27
Rocky Mountain (Colo., Idaho, Kans., Mont., Nebr., N.Dak., S.Dak., Utah)	13
Southwest (Ariz., N.Mex., Okla., Tex.)	22
Northeast (Conn., Md., W.Va.)	8
(Total)	(85)

Institutional Control	Number of Schools
Public (State)	7
Public (District)	59
Private (Religious)	14
Private (Independent)	5
(Total)	(85)

educational development and four self-reported high school grades.

The ACT battery consists of tests in English, mathematics, social studies, and natural science. The tests are intended to measure general educational development, not specific subject matter mastery. Scores are adjusted to a common reference month (November of grade 12) so that there is no systematic advantage to taking the test early or late in

Table 2

Academic Potentials of Junior College and Four-Year College Samples

	85 Junior Colleges[1]		205 Four-Year Colleges[2]		"t"[3]
	Mean	S.D.	Mean	S.D.	
ACT English	17.6	5.2	19.8	4.9	59.25
ACT Math	17.4	6.2	20.0	6.2	58.69
ACT Social Studies	18.2	5.9	20.7	5.7	59.52
ACT Natural Science	18.5	6.1	20.8	6.0	53.12
ACT Composite	18.0	4.9	20.5	4.8	71.43
H.S. English	2.39	.90	2.75	.86	56.25
H.S. Math	2.15	1.00	2.45	.98	42.25
H.S. Social Studies	2.49	.91	2.85	.88	56.25
H.S. Natural Science	2.25	.93	2.54	.92	43.94
H.S. Average of Four Grades	2.32	.73	2.65	.71	63.46

[1]Total number of students = 24,549
[2]Total number of students = 101,634
[3]All differences significant beyond .01 level

For the colleges in these samples, the four-year colleges attracted students whose academic potential averaged higher than that of junior college freshmen. Mean differences tended to be between one-third and one-half of a standard deviation. The extraordinarily large "t" values are a function of the large number of cases; with so many students in each sample, even trivial mean differences might be statistically significant.

Question 2. How much diversity is there among junior colleges compared with four-year colleges?

Table 2 shows that, as a whole, students enrolled in two-year and

was somewhat greater than the typical variability within four-year colleges; that is, the typical junior college contends with a somewhat greater range of academic talent than does the typical four-year institution.

Question 3. What grading practices characterize junior colleges?

We have previously pointed out that colleges participating in the ACT Research Services typically report overall GPA's and first-year grades in English, mathematics, social studies, and natural science. Since ACT routinely collects the most recent high school grade[5] in these same areas, it was possible to compare high school and college grades. The results for both junior colleges and four-year colleges are shown in Table 4. Differences between the two types of colleges were tested for statistical significance.

Table 4

High School and College Grades at Two- and Four-Year Colleges

	Junior Colleges[1]		Four-Year Colleges[2]		"t"[3]
	Mean	(S.D.)	Mean	(S.D.)	
H.S. English grade	2.39	(.90)	2.75	(.86)	52.17
Coll. English grade	1.98	(.98)	2.03	(.96)	6.62
H.S. Math grade	2.15	(1.00)	2.45	(.98)	26.32
Coll. Math grade	1.93	(1.12)	2.04	(1.15)	8.54
H.S. Soc.Studies grade	2.49	(.91)	2.85	(.88)	43.88
Coll. Soc.Studies grade	1.92	(.99)	2.00	(.91)	9.04
H.S. Nat.Sci. grade	2.25	(.93)	2.54	(.92)	30.90
Coll. Nat.Sci. grade	1.90	(1.06)	1.96	(1.05)	5.61
Average 4 H.S. grades	2.32	(.73)	2.65	(.71)	65.14
Coll. Overall grades	2.05	(.81)	2.11	(.79)	10.47

[1]N varies from 9,204 (Mathematics) to 24,549 (Overall)
[2]N varies from 44,523 (Mathematics) to 101,634 (Overall)
[3]All differences significant beyond .01 level

[5]Senior grades are not used.

Table 5 summarizes the predictive validity of ACT data for the criteria which colleges most typically use. Results are reported separately for junior colleges and four-year colleges.

Table 5

Predictive Validity of ACT Data:

Median Correlations and Standard Errors of Estimate for

Junior Colleges and Four-Year Colleges

Criterion	No. of Colleges	T Index		H Index		TH Index	
		R	(SE)	R	(SE)	r	(SE)
Coll. Eng. grades							
Jr. Colleges	82	.51	(.80)	.54	(.79)	.62	(.73)
4-Yr. Colleges	197	.54	(.72)	.51	(.75)	.61	(.68)
Coll. Math grades							
Jr. Colleges	48	.44	(1.01)	.48	(.99)	.57	(.94)
4-Yr. Colleges	119	.44	(1.00)	.44	(.99)	.53	(.94)
Coll. Soc. St. grades							
Jr. Colleges	72	.51	(.82)	.51	(.84)	.61	(.78)
4-Yr. Colleges	168	.51	(.82)	.49	(.82)	.59	(.76)
Coll. Nat. Sci. grades							
Jr. Colleges	60	.51	(.92)	.52	(.90)	.61	(.83)
4-Yr. Colleges	157	.49	(.88)	.51	(.87)	.59	(.81)
Coll. Overall GPA							
Jr. Colleges	85	.51	(.67)	.58	(.65)	.64	(.61)
4-Yr. Colleges	205	.55	(.62)	.58	(.60)	.65	(.56)

Table 5 shows that test scores and high school grades have highly acceptable predictive validity in both junior colleges and four-year institutions. While the correlations obtained for the two types of colleges are of a similar magnitude, the junior college standard error of estimate

ACT tests. We need additional research experience with such specific courses as these to determine the courses for which ACT data have useful validity.

Question 5. Are junior colleges for which ACT data predict relatively well different from those for which they predict less well?

Richards, Rand, and Rand (1965b) recently reported that the major institutional characteristics of junior colleges could be described by six independent factors. They labeled the factors: Private Control, Technological Specialization, Size, Conventionalism, Transfer Emphasis, and High Cost.[7] Junior colleges for which grades were relatively predictable and unpredictable were compared on these six dimensions.

In 13 colleges the TH correlation was below .55. Scores for these 13 colleges on six factors were compared with the factor scores for the 20 colleges for which this correlation was above .70. Differences between means were tested by the conventional "t" test. Results are summarized in Table 7.

Table 7

Comparison of Junior Colleges for which Predictive Accuracy Was Relatively Low and Relatively High

Factor	Pred. Accuracy High (N=20)		Pred. Accuracy Low (N=13)		"t"
	Mean	S.D.	Mean	S.D.	
Private Control	4.85	1.5	4.31	2.1	.87
Tech. Spec.	4.85	1.5	5.46	1.3	- .30

[7]In an earlier study, Richards, Rand, and Rand (1965a) labeled the Private Control factor as Cultural Affluence, Conventionalism as Age, and High Cost as Business Orientation.

The High Cost factor was described by Richards et al., as follows. Junior colleges which are low on this factor would have relatively few students majoring in such business curricula as sales, retailing, and management; low tuition; and few faculty members with the Ph.D. degree. Junior colleges which are high on this factor would have more students in business fields, a high tuition, and a higher proportion of faculty members with the Ph.D. degree.

Discussion and Implications

The nature of the samples limits the interpretation of these findings. Lacking comparison with random samples from the national population, we must be cautious in generalizing these results to all colleges.

A further limitation concerns the criteria. Colleges participating in the ACT Research Service report overall GPA for every student, but they are free to report any specific course grades as additional criteria. While these specific grades are usually in freshman English, mathematics, social studies, and natural science, these groupings are too broad to ensure comparability. Thus, one college may report grades in remedial algebra as a criterion in the mathematics area, while another may report grades in calculus in the same area. It is necessary to assume that, as a group, junior colleges and four-year colleges reported grades from similar courses in each of the categories.

Academic potential. Findings concerning the academic potential of junior college students are not surprising. The "open door" admissions

averaged below 15. When one considers that the standard deviation of the Composite score for college-bound students nationally is approximately 5, it is obvious that there was little overlap in the academic talents of students enrolled in junior colleges at the extremes of this distribution. It is also obvious that mean scores at some junior colleges exceed those at the typical four-year institution. Because of these differences, individual colleges will need to use extreme caution in generalizing from summary statistics to their local situation.

While diversity among junior colleges was considerable, diversity within these colleges was even more noteworthy. This study provided empirical support to the commonly held belief that junior colleges must contend with the entire range of academic talent--from the most gifted to the student of borderline intelligence. To provide academic programs which are appropriately stimulating to students of all academic levels is an immense challenge. Especially important are the needs to provide effective guidance to junior college students and to offer several levels of instruction in common subject matter areas such as English and mathematics.

An obvious implication of this diversity is that college-bound students should have more information about colleges, whether junior or four-year, to enable them to select appropriate institutions. It is through their high school counselors that this information can be dispensed and applied. Colleges differ in many ways other than academic potential, [10]

[10]See ACT Research Reports, No. 1, 3, 4, 5, and 9.

wide differences among colleges, higher education will be able to serve only a select few.

Colleges and universities considering junior year applicants should recognize that junior college and four-year college grades are not comparable, and that, when academic potential is held constant, junior college grades are higher than four-year college grades. Because of the diversity among junior colleges, however, generalization is hazardous, and college and university officials who evaluate junior college student records should have information about the grading practices of specific junior colleges. Thus, information about diversity in higher education would be useful to college and university admissions personnel, as well as to junior college educators and high school counselors.

Predictive validity. This review suggests that ACT data have highly acceptable validity for predicting academic success in junior colleges. This is especially reassuring in view of the needs of junior colleges to section students and to provide educational guidance. Such functions can be done well only when reasonably high correlations are found between predictors and criteria.

Grades were not equally predictable at all colleges. When extreme groups were compared, the junior colleges for which grades were highly predictable were characterized as high on the "Conventionalism" factor and low on the "High Cost" factor, while those colleges for which grades were least predictable obtained a reverse pattern on these two factors.

"Conventional" score below 5 or a "High Cost" score above 5; this same pattern occurred in only 4 of the 20 "high predictable" colleges.

This finding adds to the literature on predictability; prediction of junior college grades appears to be systematic. If prediction is systematic, then there is a possibility it can be manipulated, and educational purposes for which prediction is devised may eventually be more nearly realized by such manipulation.

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