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A DESCRIPTION OF MEDICAL COLLEGE ENVIRONMENTS.

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A FACTOR ANALYSIS OF 28 INSTITUTIONAL CHARACTERISTICS OF ALL CANADIAN AND AMERICAN MEDICAL COLLEGES (N-100) WAS UNDERTAKEN TO DEVELOP A DESCRIPTIVE PROFILE OF MEDICAL COLLEGE ENVIRONMENTS. THE 28 VARIABLES INCLUDED TYPE CHARACTERISTICS, ADMISSIONS REQUIREMENTS, STUDENT CHARACTERISTICS, AND A MISCELLANEOUS CHARACTERISTICS CATEGORY. PRODUCT MOMENT CORRELATIONS AMONG THE 28 VARIABLES WERE COMPUTED AND THE RESULTING MATRIX FACTORED. FOUR FACTORS--AFFLUENCE, CANADIAN VERSUS U.S. ADMISSIONS PRACTICES, SIZE, AND EMPHASIS ON HOSPITAL TRAINING--WERE DETERMINED. THE FOUR FACTOR SCORES WERE ESTIMATED FOR EACH MEDICAL SCHOOL. EACH FACTOR SELECTED HAD VARIABLES WITH HIGH LOADINGS ON ITSELF AND VARIABLES WITH LOW LOADINGS IN OTHER FACTORS. USING THE DOOLITTLE METHOD, MULTIPLE CORRELATIONS BETWEEN FACTORS AND VARIABLES WERE COMPUTED, AND SCALED SCORES (MEAN-50 AND SD-10) FIGURED FOR EACH SCHOOL. CORRELATIONS BETWEEN MEDICAL SCHOOL CHARACTERISTICS AND THOSE OF PARENT UNIVERSITIES WERE ALSO COMPUTED TO DETERMINE THE DEGREE OF INTERACTION BETWEEN THEM. THE RESULT OF THE STUDY IS A FOUR-FACTOR PROFILE FOR USE IN FUTURE RESEARCH ON MEDICAL EDUCATION. THIS PAPER WAS PRESENTED AT THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION (NEW YORK, 1967). (JN)

A Description of Medical College Environments[1]

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Behavior is typically conceived as determined by an interaction between individual characteristics and the characteristics of the environment. Consequently, in recent years researchers in higher education have devoted considerable attention to the description of college environments. Pace and Stern (1958) developed the College Characteristics Index (CCI), a true-false inventory which measures 30 features of the environmental "press" of the college, and Pace (1963) developed the College and University Environment Scales (CUES) which consists of 150 true-false statements about college life--features and facilities of the campus, rules and regulations, extra-curricular organizations, etc. Astin and Holland (1961) developed the Environmental Assessment Technique (EAT), which attempts to assess the college environment in terms of eight characteristics of the student body: its size, average intelligence, and six "personal orientations" -- Realistic, Intellectual, Social, Conventional, Enterprising, and Artistic -- based on the proportion of students in each of six classes of major field. These EAT variables were found to account for a substantial amount of variance in CCI scales (Astin and Holland, 1961) and to be moderately correlated with scores on CUES (Pace, 1963), and later were shown to predict the "effects" of the college as reported by the student (Astin, 1963). Still another way to describe college environments is factor analysis of various measures of college characteristics (Astin, 1962, 1965a; Richards, Rand, & Rand, 1966). Finally, college environments have been viewed simply

as a set of potential stimuli, or "observable characteristics of the college that are capable of changing the sensory input to the student attending the college" (Astin, 1965 b).

The basic purpose of the present study is to extend the description of college environments to include institutions for professional education. Specifically, the goal is to develop a description of medical college environments by organizing the information currently available into a brief profile. Such a profile can be used both to characterize individual colleges of medicine, and, in subsequent research, to study more efficiently the effects of medical colleges on their students. This study somewhat resembles earlier studies of medical school environments (Hutchins, 1962 a, 1962 b; Hutchins & Wolin, 1963; Hutchins & Nonneman, 1966), but differs from them in that data were obtained only from public records, that all medical schools in the United States and Canada were included, and that a different procedure for analyzing data was used.

The basic technique is a factor analysis of 28 measures of medical college characteristics. This study, therefore, is largely a replication in a population of medical colleges of earlier studies of four-year colleges (Astin, 1962) and junior colleges (Richards et al., 1966).

Procedure

Population of Medical Colleges

The group of institutions for this study consisted of 100 medical colleges in the United States and Canada. This includes all medical colleges listed in the 1965 edition of the annual medical education issue of the Journal of the

American Medical Association (Education Number, 1965). No distinction was made between four-year and two-year medical schools. Therefore, the group of institutions studied should be considered the population of American medical colleges rather than a sample of some population.

Measures of Medical College Characteristics

Twenty-eight institutional variables were selected for study. The choice of variables had two primary aims: first, to include as many variables as possible that would be comparable to the data used in studies of four-year colleges, and second, to have a reasonably comprehensive summary of the published data for medical colleges. Data were obtained from three sources: the first two being different editions of the annual medical education issue of the Journal of the American Medical Association (1961, 1965) and the third being Medical School Admissions Requirements (Association of American Medical Colleges, 1964), a compendium published annually to aid students in their educational planning for careers in medicine. The number of medical colleges for which data were available is indicated after the description of each variable.

Type characteristics. Among the most commonly used ways of classifying colleges are type of control, geographic location, etc. The following four measures of such characteristics were included in this study:

1. Private versus Public Control -- Public score 0, private score 1. (N=100.)

2. Age of Institution[2] -- Colleges founded since 1950 scored 4, colleges founded between 1901 and 1950 scored 3, colleges founded between 1851 and 1900 scored 2, colleges founded between 1801 and 1850 scored 1, and colleges founded

in 1800 or earlier scored 0. (N=100.)

3. Canadian versus U.S. Location -- Medical colleges in the United States scored 0, medical colleges in Canada scored 1. (N=100.)

Admissions requirement. The following eight measures pertinent to admissions requirements were included:

4. Selectivity[2] -- Ratio of number of students in 1964 entering class to number of applicants. While not all students accepted by a given medical school actually enter that school, it is probable that this variable involves mainly school differences in the proportion of applicants accepted. It should be noted that selective medical colleges have a low ratio of applicants accepted. In order to have a variable on which a high score would indicate high selectivity, the obtained ratio could be subtracted from 100. (N=100.)

5. Medical College Admission Test -- Colleges not requiring the MCAT test scored 0, colleges where the MCAT is optional or recommended scored 1, colleges requiring the MCAT scored 2. (N=100.)

6. Interview -- Colleges not requiring an interview for acceptance scored 0, colleges requiring an interview scored 1. (N=100.)

7. Undergraduate Credits in Chemistry -- Colleges requiring up to 8 semester hours scored 0, colleges requiring 9-15 hours scored 1, colleges requiring more than 15 hours scored 2. (N=97.)

8. Undergraduate Credits in Biology -- Colleges requiring up to 8 semester hours scored 0, colleges requiring 9-12 hours scored 1, colleges requiring more than 12 hours scored 2. (N=97.)

9. Undergraduate Credits in Physics -- Colleges requiring up to 8 semester hours scored 0, colleges requiring 9-12 hours scored 1, colleges requiring more than 12 hours scored 2. (N=97.)

10. Undergraduate Credits in English -- Colleges requiring no semester hours in English, or stating no requirement, scored 0, colleges requiring up to 6 semester hours scored 1, colleges requiring 7-11 hours scored 2, colleges requiring more than 11 hours scored 3. (N=97.)

11. Undergraduate Credits in Liberal Arts and Humanities -- Colleges requiring no semester hours, or stating no requirement, scored 0, colleges requiring up to 6 semester hours scored 1, colleges requiring 7-10 hours scored 2, and colleges requiring more than 10 hours scored 3. (N=97.)

12. Undergraduate Credits in Math -- Colleges requiring no semester hours, or stating no requirement, scored 0, colleges requiring up to 8 semester hours scored 1, colleges requiring more than 8 hours scored 2. (N=97.)

Student Characteristics. Eleven characteristics of the student body were assessed as follows:

13. Total Number of Medical Students. (N=100.)

14. Percentage of Males in the Student Body. (N=100.)

15. Percentage of Out-of-State Students in Entering Class. (N=100.)

16. Percentage of Foreign Students in Entering Class. (N=100.)

17. Percentage of Part-Time and Special Students in the Student Body. (N=96.)

18. Percentage of Entering Students Completing Four Years of Undergraduate.

College. (N=99.)

19. Number of Graduate Degree Candidates in the Basic Medical Sciences. (N=100.)

20. Number of Postdoctoral Fellows in Basic and Clinical Sciences. (N=100.)

21. Ratio of Number of Interns to Number of Medical Students. (N=95.)

22. Ratio of Number of Residents to Number of Medical Students. (N=96.)

23. Completion Rate -- The ratio of the number of graduates in 1965 to number of students in 1961 entering class. (N=96.)

Financial characteristics. Measures of two financial characteristics were included:

24. Tuition -- For public institutions, nonresident fees were used. (N=95.)

25. Financial Aid Available -- Little precise data is reported and therefore scores are based on a rating by the investigators. Medical colleges offering a relatively small amount of aid scored 0; colleges offering a relatively large amount of aid scored 1. (N=100.)

Miscellaneous characteristics. Included here are:

26. Ratio of Number of Beds in Teaching Hospitals to Number of Medical Students. (N=60.)

27. Growth Rate -- This variable is the difference between the number of students in the 1964 entering class and the number of students in the 1961 entering class divided by the number of students in the 1961 entering class. (N=96.)

28. Size of Community in Which Located -- Medical colleges in towns with fewer than 10,000 inhabitants scored 0, colleges in towns with between 10,000 and 50,000 inhabitants scored 1, colleges in towns with between 50,000 and 250,000 inhabitants scored 2, and colleges in towns with more than 250,000 inhabitants scored 3. (N=100.)

Results

Product moment correlations were computed among the 28 variables.[3] Since not all scores were available for all colleges, a program which allows for missing data was used. Thus correlations are based only on those colleges for which data were available. While this could affect the correlations in unknown ways, only one variable had enough missing cases to make real bias a strong possibility. It is possible that the 60 colleges for which data on hospital beds were available are quite different from the other 40 colleges.

The resultant correlation matrix was factored by the principal components method with unity in the diagonal.[4] A major advantage of this procedure is that it produces factors which are linear combinations of the observed variables, thus making it legitimate to compute factor scores (Kaiser, 1965). Ten factors had an eigenvalue greater than 1.00, but inspection of a plot of these eigenvalues suggested that at most four factors should be included in the factor rotation. Accordingly, the first four factors were rotated to a final solution by the Varimax procedure (Kaiser, 1958). The rotated matrix is shown in Table 1.

Insert Table 1 about here

The next step was to estimate four factor scores for each of the 100 medical colleges. For each factor, three or four variables with high loadings on that factor and low loadings on the other factors were selected. Each variable was used in estimating scores on only one factor. Using the Doolittle procedure, multiple correlations were computed between variables and factors. The factor loadings served as validity coefficients; i.e., as the correlations between variables and factors. The variables chosen to represent each factor, the beta weight for each variable, and the multiple correlation between each group of variables and the corresponding factor are shown in Table 2.

Insert Table 2 about here

The multiple regression formula for each factor was determined from these beta weights, and was used to estimate a scaled factor score (with mean= 50 and standard deviation =10) for each medical college. In computing the estimates, the mean was substituted for any missing scores on a given variable. The estimated factor scores for the 100 medical colleges are shown in Table 3.

Insert Table 3 about here

Many of the medical colleges are part of a complex university. An important question in interpreting the characteristics of these colleges, therefore, is whether the characteristics of the medical colleges are unique or merely reflect the characteristics of their parent university. In order to answer this question, for 52 U.S. medical schools in the same location as their parent university, correlations were computed between medical school factor scores and several characteristics of the parent university reported in a comprehensive

study by Astin (1965 b). While in most cases it is clear whether or not medical colleges and parent universities are in the same location, in a few cases involving large metropolitan areas the classification is somewhat arbitrary. For example, the medical college of Northwestern (Chicago) was classified as in the same location as the parent university (Evanston), but the University of California Medical School, San Francisco was classified as in a different location from the University of California, Berkeley. Table 4 summarizes the results.[5]

Insert Table 4 about here

Cartter (1966) has recently published a thorough survey of the quality of graduate education in American universities. For the same 52 institutions, factor scores were correlated with estimates of the quality of the graduate program in four biomedical sciences. Table 5 shows the correlations.

Insert Table 5 about here

Discussion

The rotated factors are briefly described and interpreted below:

Factor A. The variables with high loadings describe a college which has many out-of-state students, a high tuition, and has many more applicants than students admitted to its entering class. It is privately or religiously controlled, and a relatively high proportion of its students have completed four years of college. The best title for this pattern might be Affluence. This factor resembles the factor given the same name by Astin (1962) in his study of undergraduate colleges.

Factor B. The most important characteristic of the high scoring college is that it is located in Canada. It requires neither the MCAT nor an interview, but requires a higher than average number of hours in physics. The best title for this factor, therefore, seems to be Canadian vs. U. S. Admissions Practices. The high scoring college also has a large number of teaching hospital beds relative to its enrollment.

Factor C. Loadings describe a college with a large number of medical students, graduate degree candidates, and postdoctoral students. An obvious title is Size. The high scoring college also has a large number of graduates relative to the size of its entering class; a characteristic which may in part result from admitting a relatively large number of transfer students in the later years of medical school. Finally, the high scoring college is located in a large community and has available a relatively large amount of financial aid.

Factor D. Colleges characterized by high loadings on this factor have a large number of interns, residents, and teaching hospital beds relative to the number of medical students. They also require a relatively large number of credits in biology and chemistry. The interpretation of this factor is less manifest than that of the preceding factors, and identification of high and low scoring colleges on the estimated factor scores was of little help. However, an appropriate title might be Emphasis on Hospital Training.

The correlations between medical college characteristics and the characteristics of the parent university indicate some similarity. In particular, Affluence and Size seem to reflect characteristics of the parent university. This supports the interpretation of these two medical school factors. The other two

medical school factors are largely independent of university characteristics.

The correlations between the medical school factor scores and the quality of the graduate program in four biomedical sciences indicate that the Size factor is most related to quality. This may mean no more than that good graduate programs attract many graduate students. Since the better programs presumably are more selective, however, it is somewhat surprising to find that they have more students (rather than just more applicants). It is also surprising that Affluence is not more highly correlated with quality of graduate science education.

The primary goal of this study was to provide a brief profile which can be used to characterize medical colleges, and which will make possible more efficient research on the effects of medical colleges on their students. It seems clear that this goal was attained, for the original 28 scores were reduced to four factors which are reasonably clear and easily interpreted. The four factors constitute a brief but fairly representative profile of medical school characteristics.

References

Association of American Medical Colleges. Medical School Admissions Requirements. Evanston, Illinois: Author, 1964.

Astin, A. W. An empirical characterization of higher educational institutions. Journal of Educational Psychology, 1962, 53, 224-235.

Astin, A. W. Further validation of the Environmental Assessment Technique. Journal of Educational Psychology, 1963, 54, 217-226.

Astin, A. W. Recent studies of college environments. Paper read at American Personnel and Guidance Association, Minneapolis, 1965. (a)

Astin, A. W. Who goes where to college? Chicago: Science Research Associates, 1965. (b)

Astin, A. W., & Holland, J. L. The Environmental Assessment Technique: A way to measure college environments. Journal of Educational Psychology, 1961, 52, 308-316.

Education Number. Journal of the American Medical Association. 1961, 178, No. 6.

Education Number. Journal of the American Medical Association. 1965, 194, No. 7.

Hutchins, E. B. The student and his environment. Journal of Medical Education, 1962, 37, Part 2, 67-82. (a)

Hutchins, E. B. The evaluation of environmental determinants. Paper read at American Psychological Association, St. Louis, 1962. (b)

Hutchins, E. B., & Nonneman, A. J. Construct validity of an Environmental Assessment Technique for medical schools. Paper read at American Educational Research Association, Chicago, 1966.

Hutchins, E. B., & Wolins, L. Factor analysis of statements describing student environments in American medical colleges. Paper read at Midwestern Psychological Association, Chicago, 1963.

Kaiser, H. F. The Varimax Criterion for analytic rotation in factor analysis. Psychometrika, 1958, 23, 187-200.

Kaiser, H. F. Psychometric approaches to factor analysis. In Proceedings of the 1964 invitational conference on testing problems. Princeton, New Jersey: Educational Testing Service, 1965.

Pace, C. R. Preliminary technical manual, College and University Environment Scales. Princeton, New Jersey: Educational Testing Service, 1963.

Pace, C. R., & Stern, G. G. An approach to the measurement of psychological characteristics of college environments. Journal of Educational Psychology, 1958, 49, 269-277.

Richards, J. M., Jr., Rand, Lorraine M., & Rand, L. P. Description of junior colleges. Journal of Educational Psychology, 1966, 57, 207-214.

Footnotes

[1]Paper read at American Educational Research Association, New York, 1967.

[2]Variables 2 and 4 were scored as described for the computations. However, correlations and factor loadings for these variables were reflected to correspond to the variable title.

[3]Computations for this research carried out at the University of Utah computer center.

[4]Tables showing means and standard deviations for the medical college characteristics, the intercorrelation matrix, and the unrotated factor matrix are included in the appendix.

[5]Since these correlations involve the population of medical colleges, it is not clear that it would be meaningful to ask if these correlations are "significant." Nevertheless, for 52 medical colleges, $r_{.05}=.27$ and $r_{.01}=.35$.

Table 1

Rotated Factor Matrix

		Rotated Factors			
		A	B	C	D
	Variable	Affluence	Canadian vs. U.S. Admissions Practices	Size	Hospital Training Emphasis
1.	Private vs. Public Control	.74	.38	.08	.03
2.	Age*	.20	.22	.29	-.14
3.	Canadian vs. U.S. Location	-.35	.81	-.14	-.06
4.	Selectivity*	.75	-.27	.04	.02
5.	MCAT Requirements	.05	-.73	.10	.07
6.	Interview Requirements	.10	-.58	.00	.18
7.	Chemistry Requirements	-.10	.19	-.33	.41
8.	Biology Requirements	-.19	-.07	-.16	.56
9.	Physics Requirements	-.03	.46	.06	-.01
10.	English Requirements	-.38	-.27	.03	.00
11.	Lib. Arts & Humanities Requirements	-.27	-.14	.28	.17
12.	Mathematics Requirements	-.27	.05	-.07	.09
13.	Number of Medical Students	-.10	-.03	.68	-.19
14.	% of Male Students	-.06	-.19	.16	.14
15.	% of Out-of-State Students	.79	-.09	.04	-.07
16.	% of Foreign Students	-.12	.22	-.05	.12
17.	% of Part-Time & Spec. Students	-.20	-.12	.07	.22
18.	% of Students with 4 Undergrad. Yrs.	.54	-.26	.08	.14
19.	Number of Grad. Degree Candidates	-.22	-.20	.56	-.09
20.	Number of Postdoctoral Fellows	.29	-.15	.60	.19
21.	Ratio of Interns to Med. Students	.18	.13	.02	.67
22.	Ratio of Residents to Med. Students	.16	-.23	.12	.61
23.	Completion Rate	.10	-.15	.53	.30
24.	Tuition	.77	-.27	.25	.21
25.	Financial Aid Available	.26	.17	.49	-.01
26.	Ratio of Beds to Med. Students	.01	.59	.21	.41
27.	Growth Rate	-.42	.19	.03	-.01
28.	Size of Community in Which Located	.11	.20	.50	-.04

*Loadings for these variables reflected to correspond to variable titles. All factors are reflected.

Table 2

Institutional Variables, Beta Weights, and Multiple Correlations for Estimating Factor Scores for Medical Colleges

Factor	Factor Loading	Beta
Affluence (multiple correlation with factor = .94)		
Percent of Out of State Students	.79	.2580
Selectivity*	.75	.3270
Private vs. Public Control	.74	.3334
Tuition	.77	.2426
Canadian vs. U.S. Admissions Practices (R = .89)		
Canadian Location	.81	.4827
MCAT Required for Admission	-.73	-.3755
Interview Required for Admission	-.58	-.2330
Size (R = .90)		
Number of Medical Students	.68	.4485
Number of Postdoctoral Students in Basic and Clinical Sciences	.60	.3351
Number of Graduate Degree Candidates in Basic Sciences	.56	.2729
Completion Rate (Ratio of 1965 Graduates to 1961 Entrants)	.53	.2707
Emphasis on Hospital Training (R = .88)		
Ratio of Interns to Medical Students	.67	.4756
Number of Undergraduate Hours in Biology Required for Admission	.56	.4019
Ratio of Residents to Medical Students	.61	.3814

* This variable has been reflected. In the actual computations, it had opposite signs.

Table 3

Estimated Factor Scores for Medical Colleges

College	Affluence	Canadian vs U.S. Admis. Practices	Size	Hospital Training Emphasis
1. Medical College of Alabama	41	46	45	47
2. U. of Arkansas School of Med.	31	46	46	43
3. Loma Linda U. School of Med.	57	46	43	54
4. U. of Calif. --Calif. Col. of Med.	46	46	47	80
5. U. of Calif. School of Med., Los Angeles	44	46	52	67
6. U. of Southern Calif. School of Med.	57	46	50	85**
7. Stanford Univ. School of Med.	60	46	45	58
8. U. of Calif. School of Med., San Francisco	44	46	61	63
9. U. of Colorado School of Med.	47	46	49	51
10. Yale University School of Med.	62	46	64	47
11. Georgetown U. School of Med.	63	46	52	47
12. George Washington U. School of Medicine	62	46	54	43
13. Howard U. College of Medicine	51	46	46	52
14. U. of Miami School of Medicine	52	46	47	61
15. U. of Florida College of Med.	45	46	43	45
16. Emory U. School of Medicine	59	46	50	53
17. Medical College of Georgia	39*	46	49	43
18. Chicago Medical School	63	46	41	66
19. Northwestern U. Medical School	61	46	59	53
20. Stritch School of Medicine of Loyola University	59	46	45	40
21. U. of Chicago School of Medicine	62	46	53	58
22. U. of Illinois College of Med.	41	46	48	55
23. Indiana U. School of Medicine	42	46	63	43
24. U. of Iowa College of Medicine	44	46	52	54
25. U. of Kansas School of Medicine	40	46	52	45
26. U. of Kentucky College of Med.	47	46	41	44
27. U. of Louisville School of Med.	56	46	46	48*
28. Louisiana State U. School of Med.	35	51	50	44
29. Tulane U. School of Medicine	54	46	63	45
30. Johns Hopkins U. School of Med.	63	46	58	49
31. U. of Maryland School of Med.	42	46	51	48*
32. Boston U. School of Medicine	61	46	46	50
33. Harvard Medical School	64	46	83	44
34. Tufts U. School of Medicine	60	46	53	46
35. U. of Michigan Medical School	48	46	70	46
36. Wayne State U. School of Medicine	46	46	54	58

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College	Affluence	Canadian vs U.S. Admis. Practices	Size	Hospital Training Emphasis
37. U. of Minnesota Medical School	42	51	75	46
38. U. of Mississippi School of Med.	45	46	42	44
39. U. of Missouri School of Med.	39	46	50	43
40. Saint Louis U. School of Med.	57	46	47	41
41. Washington U. School of Med.	63	51	48	52
42. Creighton U. School of Medicine	62	46	44	42
43. U. of Nebraska College of Med.	35	46	47	51
44. Dartmouth Medical School	61*	52	37*	49
45. New Jersey College of Med. & Dent.	50	46	42	52
46. U. of New Mexico School of Med.	50*	46	34*	58
47. Albany Med. College of Union U.	59	51	44	48
48. State U. of New York at Buffalo School of Medicine	45	46	49	55
49. Columbia U. College of Physicians and Surgeons	59	58	61	46
50. Cornell U. Medical College	60	52	51	51
51. Albert Einstein College of Med. of Yeshiva University	62	51	52	51
52. New York Medical College	57	58	54	47*
53. New York U. School of Medicine	58	46	61	46
54. State U. of New York, Downstate Medical Center	45	46	73	48
55. U. of Rochester School of Med. and Dentistry	61	52	56	49
56. State U. of New York, Upstate Medical Center	46	46	48	46
57. U. of North Carolina School of Med.	46	46	48	47
58. Duke U. School of Medicine	61	46	61	51
59. Bowman Gray School of Medicine of Wake Forest College	59	46	42	55
60. U. of North Dakota School of Med.	41*	46	38*	57*
61. U. of Cincinnati College of Med.	52	51	48	47
62. Western Reserve U. School of Med.	60	46	56	59
63. Ohio State U. College of Medicine	42	46	61	47*
64. U. of Oklahoma School of Med.	48	46	56	44
65. U. of Oregon Medical School	51	51	49	56
66. Hahnemann Med. College of Philadelphia	56	46	48	43
67. Jefferson Med. College of Philadelphia	55	46	58	43
68. Temple U. School of Medicine	55	46	59	43
69. U. of Pennsylvania School of Med.	60	46	61	52

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College	Affluence	Canadian vs U.S. Admis. Practices	Size	Hospital Training Emphasis
70. Woman's Medical College of Pa.	55	46	36	42
71. U. of Pittsburgh School of Med.	58	46	49	48
72. U. of Puerto Rico School of Med.	33	46	42	46
73. Med. College of South Carolina	40	46	47	43
74. State U. of South Dakota School of Medicine	37*	46	36*	48*
75. U. of Tennessee College of Med.	43	46	60	44
76. Meharry Medical College	58	51	34	42
77. Vanderbilt U. School of Med.	60	46	46	51
78. U. of Texas Southwestern Med. Sch.	41	46	54	53
79. U. of Texas Medical Branch	39	46	52	57
80. Baylor U. College of Medicine	58	46	51	59
81. U. of Utah College of Medicine	48	51	47	48
82. U. of Vermont College of Medicine	53	52	38	45
83. U. of Virginia School of Medicine	49	46	43	46
84. Medical College of Virginia	47	46	48	48
85. U. of Washington School of Med.	42	46	61	52
86. West Virginia U. School of Med.	39	46	48	43
87. U. of Wisconsin Medical School	45	51	57	46
88. Marquette U. School of Medicine	60	51	47	47
89. U. of Alberta Faculty of Medicine	34	66	45	44
90. U. of British Columbia Faculty of Medicine	39	66	36	48
91. U. of Manitoba Faculty of Med.	39	66	45	45
92. Dalhousie U. Faculty of Medicine	44	79	40	49*
93. Queen's U. of Medicine	42	79	41	45
94. U. of Ottawa Faculty of Medicine	50	79	41	40
95. U. of Western Ontario Faculty of Medicine	46	79	41	47
96. U. of Toronto Faculty of Med.	29	79	56	57
97. McGill U. Faculty of Medicine	52	66	52	48*
98. U. of Montreal Faculty of Med.	37	73	47	49
99. Laval U. Faculty of Medicine	43	67	49	45
100. U. of Saskatchewan College of Med.	34	60	37	54

* Variable mean substituted for one or more missing variables in computing estimate.

** Maximum score restricted to 85.

Table 4

Correlation Between Medical School Characteristics

and Characteristics of Parent University

(N = 52)

University Characteristics	Medical School Characteristics			
	Affluence	Canadian vs US Admissions Practices	Size	Hospital Training Emphasis
Selectivity	59**	-12	45**	11
Size	-45**	13	54**	-04
Realistic Orientation	-38**	13	-19	-01
Scientific Orientation	-01	-12	-05	-10
Social Orientation	-07	34*	06	06
Conventional Orientation	-13	-13	-23	05
Enterprising Orientation	51**	-21	10	07
Artistic Orientation	13	-08	33*	04

* $p < .05$
** $p < .01$

Note. --Correlations between Canadian vs. U.S. Admission Practices and other variables are point biserial coefficients. All other correlations are Pearson product-moment coefficients. Information about university characteristics obtained from Astin (1965).

Table 5

Correlations Between Medical School Factors

and Quality of Graduate Programs in Biomedical Sciences

(N = 52)

Quality	Affluence	Canadian vs US Admissions Practices	Size	Hospital Training Emphasis
Graduate Faculty				
Bacteriology/Microbiology	19	14	68**	12
Biochemistry	25	11	60**	13
Pharmacology	22	15	57**	09
Physiology	18	13	66**	09
Ph. D. Program				
Bacteriology/Microbiology	14	11	67**	10
Biochemistry	26	07	59**	18
Pharmacology	18	13	59**	07
Physiology	12	02	67**	19

* $p < .05$
** $p < .01$

Note. --Correlations involving Canadian vs. U.S. Admission Practices are point biserial coefficients. All other correlations are Pearson product-moment coefficients. Information about quality of graduate programs obtained from Cartter (1966).

Appendix

Table A

Means and Standard Deviations for Medical School Factors

		X	S.D.
1.	Private vs. Public Control	.52	.50
2.	Age*	1.99	1.05
3.	Canadian vs. U.S. Location	.12	.33
4.	Selectivity*	.14	.09
5.	MCAT Requirements	1.79	.56
6.	Interview Requirements	.78	.42
7.	Chemistry Requirements	1.71	.50
8.	Biology Requirements	.26	.44
9.	Physics Requirements	.03	.17
10.	English Requirements	1.15	.92
11.	Lib. Arts & Humanities Requirements	.59	.97
12.	Mathematics Requirements	.25	.43
13.	Number of Medical Students	356.55	140.68
14.	% of Male Students	91.31	9.96
15.	% of Out-of-States Students	35.01	29.70
16.	% of Foreign Students	2.38	8.16
17.	% of Part-Time & Spec. Students	0.80	2.16
18.	% of Students with 4 Undergrad. Yrs.	84.18	18.18
19.	Number of Grad. Degree Candidates	60.45	46.51
20.	Number of Postdoctoral Fellows	54.01	74.41
21.	Ratio of Interns to Med. Students	.15	.25
22.	Ratio of Residents to Med. Students	.49	.35
23.	Completion Rate	88.48	9.91
24.	Tuition	1254.00	382.34
25.	Financial Aid Available	.37	.49
26.	Ratio of Beds to Med. Students	4.50	3.58
27.	Growth Rate	5.65	10.21
28.	Size of Community in Which Located	2.54	.77

* Means for these variables represent actual computations. Correlations and factor loadings for them have been reflected to correspond to the variable titles.

Table B

Intercorrelations of Medical College Characteristics

Variable	1	2*	3	4*	5	6	7	8	9	10	11	12	13	14
1	--													
2*	22	--												
3	05	03	--											
4*	39	-02	-45	--										
5	-18	-10	-58	27	--									
6	-08	01	-47	10	32	--								
7	-02	05	20	-14	-13	-10	--							
8	-04	-12	01	-15	04	19	20	--						
9	05	11	30	-17	-37	-19	10	03	--					
10	-29	04	-09	-30	18	14	12	-05	-03	--				
11	-12	04	-08	-26	10	11	-01	08	-05	21	--			
12	-11	04	09	-09	-06	-16	24	04	04	22	17	--		
13	-01	24	-09	-06	08	02	-16	-05	03	03	00	-08	--	
14	-12	-11	-09	08	07	06	-08	07	-02	06	-05	-17	07	--
15	60	20	-29	56	19	09	00	-19	-05	-09	-08	-18	-12	-03
16	11	05	19	-06	-01	-10	13	15	03	-07	20	11	02	-09
17	-12	02	-11	-14	11	03	12	23	-07	-06	12	03	08	02
18	22	12	-41	39	16	32	-04	03	03	-17	01	-21	12	-03
19	-12	04	-11	-03	13	05	-14	01	-04	-07	10	-01	37	13
20	18	21	-26	26	16	15	-13	-11	-06	-04	20	03	22	06
21	13	-02	-04	14	04	05	06	18	03	-03	-08	-09	-13	08
22	-04	-15	-21	26	17	11	14	19	-07	-02	-01	-02	-09	09
23	05	-02	-25	21	13	08	-08	-07	-02	06	11	05	21	19
24	51	12	-60	61	22	21	-07	-02	-10	-19	01	-18	08	07
25	24	23	-03	17	-12	-04	-12	-10	11	-06	19	-13	09	05
26	28	16	38	-21	-28	-13	09	00	05	-17	03	-06	08	-02
27	-33	-20	35	-18	-08	-17	02	-03	03	09	02	-06	-09	-06
28	21	-06	06	15	08	-16	-19	-04	11	-03	-06	-06	36	-08

*Correlations for these variables reflected to correspond to variable title.

Table B--Page 2

Variable	15	16	17	18	19	20	21	22	23	24	25	26	27	28
15	--													
16	-08	--												
17	-06	10	--											
18	35	-01	02	--										
19	-11	00	19	-11	--									
20	32	-10	-02	19	24	--								
21	02	-01	-06	09	-07	09	--							
22	05	-12	-03	18	04	29	32	--						
23	10	-12	-10	14	15	37	16	30	--					
24	61	-20	05	48	00	42	19	28	27	--				
25	23	-10	03	08	11	25	00	11	19	30	--			
26	-11	11	11	-10	-14	12	40	-03	13	-01	06	--		
27	-25	01	13	-26	-07	-13	-04	-09	06	-34	04	08	--	
28	06	07	-15	10	16	15	08	11	15	09	19	14	12	--

Table C

Unrotated Factor Matrix

		I	II	III	IV
1.	Private vs. Public Control	-.46	-.68	.16	.01
2.	Age*	-.15	-.32	-.22	.15
3.	Canadian vs. U.S. Location	.71	-.54	-.09	-.07
4.	Selectivity*	-.74	-.11	.26	.09
5.	MCAT Requirements	-.42	.61	.00	.02
6.	Interview Requirements	-.37	.47	.09	-.11
7.	Chemistry Requirements	.22	-.08	.25	-.45
8.	Biology Requirements	.09	.19	.09	-.58
9.	Physics Requirements	.21	-.40	-.12	-.03
10.	English Requirements	.17	.41	-.14	-.01
11.	Lib. Arts & Humanities Requirements	.03	.23	-.34	-.17
12.	Mathematics Requirements	.25	.10	-.04	-.13
13.	Number of Medical Students	-.15	.00	-.66	.22
14.	% of Male Students	-.12	.19	-.15	-.11
15.	% of Out-of-State Students	-.67	-.29	.26	.17
16.	% of Foreign Students	.20	-.13	-.02	-.16
17.	% of Part-Time & Spec. Students	.05	.20	-.13	-.22
18.	% of Students with 4 Undergrad. Yrs.	-.60	-.03	.15	-.05
19.	Number of Grad. Degree Candidates	-.10	.22	-.58	.11
20.	Number of Postdoctoral Fellows	-.55	-.05	-.44	-.11
21.	Ratio of Interns to Med. Students	-.19	-.17	.04	-.66
22.	Ratio of Residents to Med. Students	-.37	.14	-.03	-.56
23.	Completion Rate	-.39	.05	-.44	-.25
24.	Tuition	-.86	-.13	.08	-.09
25.	Financial Aid Available	-.31	-.31	-.37	.04
26.	Ratio of Beds to Med. Students	.12	-.52	-.25	-.45
27.	Growth Rate	.41	.03	-.19	-.06
28.	Size of Community in Which Located	-.18	-.27	-.45	.05
	Eigenvalue	4.36	2.64	2.11	1.84

* Loadings for these variables reflected to correspond to variable title.

Note.--The other eigenvalues greater than 1.00 were in order: 1.73, 1.49, 1.29, 1.21, 1.18, and 1.11.