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THE RELATION OF HIGH SCHOOL GRADES, ACHIEVEMENT AND INTELLIGENCE TEST SCORES TO SUCCESS IN DENTAL SCHOOL

Prediction of college achievement level has long been an important concern of high-school counsellors and educational researchers. Attempts began as early as 1928 to investigate relationships between high-school and college grades (Learned & Wood, 1938). Results generally have indicated a correlation of about .90 between high school and college achievement (Bloom, 1964, pp. 95-96).

However, few studies have investigated the relationship between achievement in high school and achievement in post-college professional schools such as law and medicine. Since the post-college professional schools are becoming increasingly stringent in their entrance requirements (Heller, Carson, & Douglas, 1965), knowledge of the relationship would be useful to the high-school counsellor. The present study is concerned with obtaining such knowledge.

Specifically, the purpose of the study was to investigate the relationship between selected high-school variables and achievement in dental school.

METHOD

The subjects were 230 members of the classes entering a southwestern U.S. dental school in 1962, 1963, 1964, and 1965.

The freshman dental grade point average (FGPA) was selected as the criterion of success in dental school. Freshman rather than graduating grade point average was selected to reduce the time lapse between obtaining the independent variables and the criterion and to include in the study students who were in the freshman year but failed to graduate.

The high school which each student had attended was contacted by mail, and a list of high-school courses, grades, intelligence and achievement test scores was requested.

From the information received, scores on the following variables were recorded: FGPA; high-school GPA; high-school rank; science GPA (including mathematics); non-science GPA; English, biology, chemistry and physics GPA's; percent of coursework in science; Co-operative School and College Ability Test (SCAT) verbal; SCAT quantitative; SCAT total; American Council on Education Test (ACE) verbal; ACE quantitative; ACE total; Otis IQ and California Test of Mental Maturity (CTMM) IQ.

Grade points were assigned on a four point scale, that is 4 = 4, B = 3, C = 2 and D = 1.

Means and standard deviations for each variable were computed. Correlation coefficients were determined between each of the 17 independent variables and the criterion variable.

RESULTS

Replies were obtained from 192 of the 230 students, representing 83% return, but it was not possible to obtain information on all 18 variables for these 192 students. Means, standard deviations, and number of cases for each variable, and the correlation of each independent variable with the criterion are given in Table 1.

Table 1—Means, standard deviations and number of cases for the independent and criterion variables, and correlations of the independent variables with the criterion.

Variable	Mean	S.D.	N	r
FGPA	2.44	.50	192	—
High-school GPA	2.96	.50	156	.17*
High-school rank	.26	.15	75	-.02
Science GPA	2.89	.57	153	.19*
Non-science GPA	3.00	.50	153	.18*
English GPA	2.89	.63	153	.20*
Biology GPA	2.98	.75	130	.05
Chemistry GPA	2.76	.78	119	.20*
Physics GPA	2.85	.71	105	.25*
Percent science	27.7	6.7	150	.12
SCAT verbal	59.8	25.0	47	.23
SCAT quantitative	68.4	21.6	47	.33*
SCAT total	65.7	21.1	47	.33*
ACE verbal	60.3	24.7	46	.31*
ACE quantitative	69.3	22.2	46	.17
ACE total	65.2	24.0	46	.29*
Otis IQ	118.6	9.6	56	.06
CTMM IQ	118.0	7.3	46	.38*

* $p < .05$

Eleven of the seventeen correlations with FGPA were significant beyond the .05 level. These significant correlations ranged from .17 to .38.

Mean high-school grade point averages were approximately 3.0, representing a B average. Mean high school IQ was about 118.

DISCUSSION

The number of significant correlations between the independent variables and the criterion suggests important relations in overall grade point average: grades in English, physics and chemistry; and CTMM IQ.

However, the usefulness of these relationships is limited by two factors. First, the statistically significant correlations were barely high enough in most cases to achieve significance. That is, one may say with some assurance that these relationships are significantly greater than zero, but that is about as far as one may go. Second, the size of the correlation coefficients obtained indicates that any one variable contributes little more than 10% to the criterion variance.

The means of the independent variables indicate that the dental students were probably in the upper third of their high-school classes in achievement. This is in accord with Mann's finding that most dental school applicants "estimated they were in the upper third of their high school classes (Mann, 1961, p. 266)."

The implication of these findings for the high-school counsellor is that a student need not be in the upper five or ten percent of his class before consideration of dentistry is a realistic consideration. While achievement and intelligence level have some relationship to later success in dental school, the relationship is not sufficiently strong to provide more than a very approximate prognosis of dental-school achievement.

REFERENCES

- Bloom, B. S. *Stability and change in human characteristics*. New York: Wiley, 1964.
- Heller, D. B., Carson, R. L., & Douglas, B. L. Selection of students for dental schools. *Journal of Dental Education*, 1965 **29**, 202-205.
- Learned, W. S., & Wood, B. C. *The student and his knowledge*. New York: The Carnegie Foundation for the Advancement of Teaching, 1938.
- Mann, W. R. Dental education. In B. C. Hollinshead (Ed.), *The survey of dentistry; The final report of the commission on the survey of dentistry in the United States*. Washington: American Council on Education, 1961.

LA SCOLARITE AU SECONDAIRE, LES RESULTATS DES TESTS DE RENDEMENT ET D'INTELLIGENCE PEUVENT-ILS PREDIRE LE SUCCES A L'ECOLE D'ART DENTAIRE?

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Cette étude voulait essayer d'établir un lien entre certaines variables du niveau secondaire et le rendement à l'école d'art dentaire afin de fournir aux conseillers d'orientation du cours secondaire des informations qui aideront les étudiants qui désirent poursuivre leurs études dans une école professionnelle universitaire.

L'étude se fit auprès des étudiants en art dentaire de première année. Les données portaient sur la scolarité au secondaire et les résultats de tests de rendement et d'intelligence.

Sept des onze corrélations s'avérèrent significatives mais relativement peu élevées. La moyenne se situait autour du soixante-cinquième rang centile.

Il faut donc conclure que si le rendement et l'intelligence ont une certaine relation avec le succès à l'école dentaire, cette relation n'est pas assez forte pour établir des pronostics, sinon d'une façon tout à fait approximative, quant au succès aux écoles d'art dentaire.