DOCUMENT RESUME

ED 039 304 UD 010 062

AUTHOR Bhushan, Vidya
TITLE Comparison of I.Q. and Socioeconomic Index in Predicting Grade Point Average.
PUB DATE 6 Mar 70
NOTE 7p.; Paper presented at the Annual Meeting of the American Educational Research Association, Minneapolis, Minn., March 2-6, 1970

EDRS PRICE EDRS Price MF-$0.25 HC Not Available from EDRS.
DESCRIPTORS Academic Achievement, Academic Performance, Economic Factors, Family Status, Grade Point Average, *Grade Prediction, *High School Students, *Intelligence Factors, *Intelligence Quotient, Occupational Information, Predictive Ability (Testing), Predictive Measurement, Social Factors, *Socioeconomic Status
IDENTIFIERS Hawaii

ABSTRACT

High school teachers and counselors, especially those concerned with the lower grade levels, should take into consideration a student's socioeconomic background along with his intellective factors whenever his academic performance is predicted. In lower grades where intelligence tests cannot be given effectively, socioeconomic status (SES) index with IQ score will be a better predictor of academic performance than prediction with IQ score alone. In the present study, a stratified random sample of three high schools (one rural, one small urban, and one large urban) was taken from the Island of Oahu. Both the urban schools had grades 7-9 only, while the rural school had grades 7-12. Data were collected for all students of grades 7, 9, and 12. From the school folders the following information was obtained for each student: group IQ score, letter grades of the previous year, and the occupation and education of the student's father or guardian. Only the 799 cases for which complete information was available were retained in the sample. Step-wise regression analysis was done for SES, IQ, and grade point average (GPA), treating the first two variables as predictors, and the last as a criterion. Results indicate that both SES and IQ contribute significantly to the prediction of GPA, but the contribution of IQ is greater than that of the former. [Not available in hard copy due to the marginal legibility of the original document.] (JM)

COMPARISON OF I.Q. AND SOCIOECONOMIC INDEX IN PREDICTING GRADE POINT AVERAGE[1]

Vidya Bhushan

Laval University

Attemps to predict academic achievement have utilized intellective as well as nonintellective variable. The relationship between ability and academic performance is well documented, and the great majority of studies are no longer concerned primarily with demonstrating this finding. Rather, they attempt to improve predictions through the use of additional factors of a nonintellective nature. Moreover, the fact that ability measures account for less than half of the variation in academic performance leads to a consideration of nonintellective factors. In this connection, many investigators study academic performance by focusing upon personality characteristics as explanatory variables. Lavin (5), after reviewing the literature, concluded that the specific personality variables studied in relation to academic performance are usually selected by common sense or hunches rather than on the basis of a systematic personality theory. He also found that in most cases these relationships were quite weak, and the findings were often inconsistent. Perhaps personality characterictics might be more useful in predicting academic performance if the social setting in which that performance takes place is conceptualized and used as a significant variable.

---

[1] Paper presented at the annual Meeting of the American Educational Research Association, held March 2-6, 1970, in Minneapolis.

Socioeconomic status (SES) is a variable that may be regarded as summarizing a variety of personality characteristics (5). It mediates a variety of values, attitudes, and motivations related to academic performance. Moreover, the observation of differences in academic performance according to SES should sensitize the researcher to the kinds of personality variables that are relevant.

SES is positively associated with I.Q. This finding is also well established, but it raises a question concerning the degree to which SES and intelligence are independently related to academic performance. Are these two equally effective in predicting academic performance? Or, is the prediction enhanced significantly by adding the two variables? This study was conducted to answer these questions.

Procedure

A stratified random sample of three high schools was taken from the Island of Oahu. As the Island has schools in urban as well as in rural areas, first the stratification of all the high schools was done on this basis. Number of students in a school is also an important variable which is related to the study; hence schools were further stratified into large versus small schools. On this island there are very few schools in rural areas in comparison with urban areas. Moreover, the schools in the rural areas are of about the same size. Therefore the stratification by size was done for urban schools only. Thus three high schools, one from rural areas and one small school and one large school from urban areas, were randomly selected. Both the urban schools had grades 7 to 9 only, while the rural school had grades 7 to 12. Data were collected for all the students of grades 7, 9, and 12 of the three schools.

From the school folders, the following information was obtained for each individual: group I.Q. score, letter grades of the previous year, and the occu-

pation and education of his father or guardian. Only the 799 cases for which complete information was available were retained in the sample.

Letter grades were converted into numbers, and a grade-point average (GPA) was calculated for each individual. On the basis of Hollingshead's (4) Two-Factor Index of Social Position Scores, education and occupation were weighted and an index of socioeconomic status was calculated for each individual. Step-wise regression analysis was done for SES, I.Q., and GPA, treating the first two variables as predictors and the last variable as a criterion.

Results and Discussion

The means, standard deviation, and correlation matrix for the three variables for the total sample are given in Table I. The correlations of I.Q. and GPA with SES are negative because for higher SES, the index of social position scores is lower. The correlation of GPA with I.Q. is greater than with SES.

Table I

Means, S.C.'s, and Correlation Matrix

for SES, I.Q., and GPA

Variable	Mean	S.D.	Correlation Matrix		
			SES	I.Q.	GPA
SES	48.82	17.78	1.00	-0.428*	-0.392*
I.Q.	109.70	16.74		1.00	0.620*
GPA	2.10	0.78			1.00

*$p < .01$

A step-wise regression analysis for the three variables, with GPA as the criterion is given in Table 2. The regression of SES and I.Q. for predicting GPA is significant at the .01 level. When the effect of SES is partialed out from the prediction, its loss is also significant at .01 level. This indicates that both SES and I.Q. contribute significantly in the prediction of GPA, but the contribution of I.Q. is greater than the contribution of SES. The significant contribution of SES as well as I.Q. in the prediction of GPA is supported by the study conducted by Fang and Davis (1), who concluded that intelligence and SES together make a contribution to the superior performance of the high SES subjects.

Table 2

Step-Wise Regression Analysis

for SES, I.Q., and GPA

Source	df	Sum of Squares	Mean Squares	F-Ratio
Two-Variable Regression	2	198.142	99.071	270.150*
I.Q. Regression	1	188.486		
Loss due to the elimination of SES	1	9.656	9.656	26.3287*
Two-Variable Residual	796	291.914	0.367	
Total	798	490.056		

* $p < .01$

The correlations between the three variables at the three grade levels are given in Table 3.

Table 3

Correlations of GPA with SES and I.Q.

at three Grade Levels

Variable	7th Grade			9th Grade			12th Grade		
	SES	I.Q.	GPA	SES	I.Q.	GPA	SES	I.Q.	GPA
SES	1.00	-0.508*	-0.446*	1.00	-0.362*	-0.338*	1.00	-0.35*	-0.10
		1.00	.646*		1.00	0.595*		1.00	0.524*
			1.00			1.00			1.00

*p <.01

The correlations of GPA with SES and I.Q. with SES are greatest at the 7th grade level and decrease as the grade level increases. This suggests that SES may be a better predictor at the lower grade level than at the higher. This finding is in agreement with a longitudinal study of American youth by Flanagan et al. (2), who concluded that whatever direct effects socioeconomic background has on achievement occur before grade 9. The correlations of GPA with I.Q. at the three grade levels are higher than the corresponding correlations of GPA with SES indicating the importance of I.Q. in predicting GPA at all grade levels.

The present study is not inconsistant with the general conclusion of French (3), and Lunneborg and Lunneborg (6) that, while intellective measures contribute most to the absolute prediction of college grades, certain nonintellective measures contribute most to differential prediction and thus have a place in prediction when the goal is maximum utility to the individual. SES is a nonintellective

measure in this study.

Conclusions

The results of this study are potentially very helpful to the teachers and counselors of high schools, especially to those who are concerned with the lower grade levels. The findings indicate they should take into consideration a student's socioeconomic background along with his intellective factors whenever his academic performance is predicted. In lower grades where intelligence tests cannot be administered effectively, socioeconomic index with I.Q. score will give a better predictor of academic performance than the prediction with I.Q. score alone. The present study should be replicated in other places, since present results cannot be generalized from the Island of Oahu.

1. Fang, Marcus C. S. and Davis, J. K. Effect of incentive and complexity on performance of students from two social class backgrounds on a concept identification task. Paper presented at the annual meeting of the American Educational Research Association, New York City, February 16-18. 1967.

2. Flanagan, J. C. et al. Cognitive growth during high school. Project Talent, Bulletin No. 6, April, 1967.

3. French, J. W. Comparative prediction of college major-field grades by pure-factor aptitude, interest, and personality measures. Educational and Psychological Measurement. 23:767-74, 1963.

4. Hollingshead, A. B. Two Factor Index of Social Position. New Haven, Connecticut: Author, 1957.

5. Lavin, David E. The Prediction of Academic Performance. New York, Russell Sage Foundation, 1965.

6. Lunneborg, P. W. and Lunneborg, C. E. The differential prediction of college grades from biographic information. Educational and Psychological Measurement. 26:917-25, 1966.