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ABSTRACT

The predictive validity of the Scholastic Aptitude Test (SAT) for Mexican-Americans is investigated. Forty-two Mexican-American freshmen students who entered the University of California, Riverside, in the Fall 1971 participated in the study. Analyses of variance concerning ethnic groups on GPA (grade point average) and SAT verbal (SATV) and math scores (SATM) were performed indicating higher Anglo-American scores on all measures. The hypothesis that both groups can be described by the same regression plane can be rejected. When the Anglo-American regression equation was used to predict the grades of Mexican-American students, substantial overprediction resulted. If separate equations are calculated for each subgroup, the SAT is almost as predictively valid for Mexican-American students as it is for Anglo-American students. It would appear that the pattern of standardized regression rates for GPA and SATM (since Mexican-American students score higher on math probably due to bilingualism, in which vocabulary might be more affected than mathematical reasoning) does not maximize grade success for the ability profiles of Mexican-American students as a group. (RC)

THE SAT PREDICTION OF GRADES FOR MEXICAN-AMERICAN VERSUS ANGLO-AMERICAN STUDENTS AT THE UNIVERSITY OF CALIFORNIA, RIVERSIDE

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In recent years there have been a number of studies comparing the validity of academic predictors for Black versus White college students (Temp, 1971; Stanley, 1971; Cleary, 1968). At present two findings seem to be fairly stable: First, there is no evidence of any systematic underprediction of the grades of Black students through the use of standardized tests. Second, the SAT, used in largely segregated institutions, has been found to be about as predictively valid for Blacks as for Whites. Another finding which seems a bit less certain concerns the Black-White equivalence of regression planes for GPA on predictors. Temp (1971) performed a survey of 13 institutions comparing Black versus White regression of GPA on SATV, SATM, SATV plus SATM, and the multiple regression of GPA on SATV and SATM. He found only 9 of 52 instances in which the hypothesis of a single regression plane (for both Black and White students) could not be rejected at the .05 level. Similar findings have been reported by others (Pfeifer & Sedlacek, 1971; Kallingal, 1971). Cleary (1968) reports Black-White equality of regression slopes for all comparisons and equality of intercepts in two of three comparisons.

The studies which have been cited compare Blacks with Whites. There are no studies which investigate the predictive validity of the SAT for Mexican-Americans. This is an unfortunate omission since Mexican-Americans comprise a large minority, particularly in the southwestern United States. There is no *a priori* reason for the prediction of GPA by the SAT to be similar for both Blacks and Mexican-Americans. There are differences between the groups that

could affect the psychometric properties of the SAT in different ways, the most obvious of which is bilingualism. In addition to the issue of validity and the pragmatic implications (college admission) which stem from it, the covariance structure of GPA and SAT measures may be used to provide insights into ethnic differences in scholastic strategies.

Investigations of problem solving (Bruner, Goodnow, & Austin, 1956; French, 1965; Frederiksen, 1969) have demonstrated that many tasks can be performed by alternative methods. Performance differences might reflect differences in strategy usage as well as ability differences. Frederiksen (1970) concisely states the point that, "...for a given task it is conceivable that more than one set of functions (strategies) could independently result in effective performance (p. 3)." If there are more than one set of (co-adaptive) functions that can be used to effectively perform the task, then the task is functionally indeterminant. Through the choice of a strategy to perform a functionally indeterminant task the individual, in effect, restructures the task. Thus, according to differential process theory, strategies mediate between abilities and performance. Psychometric support for this theory is found in the result that ability-performance covariance structure can be drastically altered by partialling out a set of strategy measures from both ability (predictor) and performance (criterion) measures (Frederiksen, 1969).

While Frederiksen's research has employed verbal learning tasks to derive performance criteria, it appears likely that differential process theory can be applied to academic criteria as well. Clearly, a college career presents students with a series of tasks. It seems likely that these tasks can indeed be restructured either macroscopically (by choosing certain college classes) or microscopically (by choosing some strategic approach within classes). If Mexican-Americans, in general, perform scholastic tasks by different methods than Anglo-Americans,

then certain abilities should have different valence for prediction of (grade) performance. There is some reason to suspect differences between Anglo-American and Mexican-American students in the use of problem solving strategies. Castaneda, Ramirez and Herold (1972) report comparisons of Mexican-American and Anglo-American grade school children on Witkin's (1962) cognitive style measures. Mexican-American students were found to be more field dependent, a trait associated with greater sensitivity for the human environment and verbal expressiveness. Thus there is reason to expect Mexican-American students to restructure abstract tasks so as to make them less impersonal. This might imply less use of mathematical or syllogistic reasoning. Unfortunately it is difficult to specify discrete scholastic strategies (see Goldman, 1972, for an example). In a superordinate sense, the choice of which classes to take may be considered as a strategy for performing the task "succeed in college." Clearly if members of one ethnic group choose no science or mathematics classes then SATM should have less predictive validity for that group. In fact, this strategy has been suggested by Stanley (1971) as a possible explanation of Black-White differences in college performance.

Method

The population of subjects for this study consisted of all Freshmen who entered the University of California, Riverside (UCR) in Fall, 1971. Only those who had completed the winter quarter and had complete data were used. Second quarter GPA (based upon a 4-point scale) was predicted from the verbal and mathematical subtests of the Scholastic Aptitude Test (SATV and SATM). Mexican-American students were identified by surname. Seven judges were employed for this purpose. Classification by five of the seven judges was considered necessary for an individual to be classified as Mexican-American.

Anglo-American students were randomly sampled from the registrar's selecting every fifth name. There were 42 Mexican-American students and 210 Anglo-American students in the present investigation.

Results

Analyses of variance comparing ethnic groups on GFA, SATV, and SATM were performed indicating higher Anglo scores on all measures ($p < .0001$). The hypothesis that both groups can be described by the same regression plane can be rejected ($F[2,246] = 3.94$; $p < .05$). When this Anglo-American (majority) regression equation was used to predict the grades of Mexican-American students, substantial overprediction resulted (Predicted GPA = 2.66; Obtained = 2.28).

For the Anglo-American sample, the multiple correlation coefficient was .44 ($F[2,207] = 26.08$; $p < .01$) while for the Mexican-American sample it was .35 ($F[2,39] = 2.68$; $p < .10$). The difference between the coefficients was nonsignificant. The multiple correlation equations for each group are presented in Table 2. A comparison of the beta weights for each group reveals that the weight given to SATM is larger for the Anglo sample than for the Mexican-American sample ($t[2,48] = 2.40$; $p < .05$).

Discussion

It is clear that if prediction of GPA from SAT is based upon an Anglo-American regression equation then the GPA of Mexican-American students, as a group, is substantially overpredicted. It also appears that the SAT is only slightly (and not significantly) more valid for the prediction of GPA in

Anglo-American as opposed to the Mexican-American samples. Finally, it appears that the regression equations for the two groups are not homogeneous (i.e., a single regression equation would not adequately describe the GPA-SAT relationships for both groups). When the standardized regression weights were compared for both groups, it appeared that they differed in the weight given to SATM but not on the weight given to SATV. At this point, it is appropriate to ask, "How should these findings be interpreted?"

On a pragmatic level one might be led to these conclusions: (1) If the SAT is used to predict the grades of Mexican-American students, it will substantially overpredict grades when an Anglo-American derived regression equations is employed. (2) If separate equations are calculated for each subgroup, the SAT is almost as predictively valid for Mexican-American students as it is for Anglo-American students.

On a heuristic level the results can be used to generate several tentative hypotheses. Since it appears that standardized multiple regression coefficient in the Mexican-American sample do not give much weight to SATM, it is suggested that Mexican-American students employ some form of scholastic strategy that places little emphasis upon mathematical reasoning. (The group difference in regression weights does not appear to be an artifact of the tests since both ethnic groups have similar variances on both SAT measures.) An obvious explanation for the different pattern of standardized regression weights would be that Mexican-American students take different classes than Anglo-American students. This explanation, however, can be easily rejected through reference to the incidence of the choice of different major fields in both ethnic groups, which (at least for Freshmen) appears to be virtually identical for both groups. It would seem that the hypothesis suggested by Castaneda et al., that Mexican-American students are more field dependent than Anglo-American students may

provide the explanation. This hypothesis would lead to the expectation that mathematical abilities should, therefore, be less important (for grade success) for Mexican-American students. The paradoxical nature of this result is evidenced by the fact that Mexican-American students have considerably higher SATM scores than SAT scores. (This is probably due to bilingualism, in which vocabulary might be more affected than mathematical reasoning.) In sum, it would appear that the pattern of standardized regression weights (for GPA and SATM) does not maximize grade success for the ability profiles of Mexican-American students as a group. If this pattern of regression weights stems from strategy usage, then the strategy is counterproductive. While the elucidation of such strategies, however, is certainly a topic worthy of its own manuscript and cannot be treated here, perhaps it might be possible for Mexican-American students to improve college grade success by their adoption of more field-independent strategies. Finally, it should be noted that the results may be particular to UCR, and, therefore, studies of this kind should be undertaken elsewhere.

References

Castaneda, A., Ramirez, M., & Herold, J. Culturally democratic learning environment: A cognitive styles approach. Riverside, California: Systems and Evaluation in Education, 1972.

Cleary, T. A. Test bias: prediction of grades of Negro and White students in integrated colleges. Journal of Educational Measurement, 1971, 8, 71-82.

Frederiksen, C. H. Abilities transfer and information retrieval in verbal learning. Multivariate Behavioral Research Monographs, 1969, No. 2, 1-82.

Frederiksen, C. H. Functional indeterminacy and cognitive processes in learning performance. Paper presented at Western Psychological Association-Convention, Los Angeles, April 1970.

French, J. Social class and the relationship of problem-solving styles to the factor composition of tests. Educational and Psychological Measurement, 1965, 25, 9-28.

Goldman, R. The effects of a logical versus a mnemonic learning strategy upon performance in two undergraduate psychology classes. Journal of Educational Psychology, 1972 (In Press).

Kallingal, A. The prediction of grades for black and white students at Michigan State University. Journal of Educational Measurement, 1971, 8, 263-265.

Pfeifer, C. M., & Sedlacek, W. E. The validity of academic prediction for black and white students at a predominantly white university. Journal of Educational Measurement, 1971, 8, 253-261.

Stanley, J. C. Predicting college success of the educationally disadvantaged. Science, 1971, 171, 640-647.

Temp, G. Validity of the SAT for blacks and whites in thirteen integrated institutions. Journal of Educational Measurement, 1971, 8, 245-251.

Witkin, H., Dyk, R., Faterson, H., Goodenough, D., & Karp, S. Psychological Differentiation. New York: Wiley, 1962.

TABLE 1

Means, Standard Deviations, and Intercorrelations of Grades and SAT Scores

Anglo-American

Variables	Mean	S. D.	Intercorrelations 1	2	3
1. GPA	2.74	.77			
2. SATV	540.43	93.82	.40**		
3. SATM	557.65	95.74	.37**	.52**	

Mexican-American

1. GPA	2.28	.59			
2. SATV	463.27	102.24	.33*		
3. SATM	495.15	112.78	.12	.59**	

* $p < .05$

** $p < .01$

TABLE 2

MULTIPLE CORRELATION EQUATIONS OF GPA WITH SATV AND SATM

	Predictor Beta Weights	
	SATV	SATM
Anglo-American	.28**	.22**
Mexican-American	.40*	-.12

* $p < .05$

** $p < .01$