

DOCUMENT RESUME

ED 074 430

CG 007 935

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TITLE Affective and Cognitive Correlates of Classroom Achievement: Research for the Counselor.
SPONS AGENCY Connecticut Univ. Research Foundation, Storrs.
PUB DATE Feb 73
NOTE 13p.; Paper presented at the American Educational Research Association Convention, February 26-March 1, 1973, New Orleans

EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS *Academic Achievement; Academic Performance; Achievement Tests; *Affective Behavior; Affective Tests; Behavior; *Cognitive Ability; Cognitive Development; Cognitive Measurement; *Cognitive Tests; Counseling; Counselors; High School Students; *Rating Scales; Research Projects; Success Factors

ABSTRACT

The relationship between cognitive and affective variables in the context of predicting student achievement performance in the classroom is examined. Specifically, the study examines the two-part question: 1) to what extent, and 2) in what manner can classroom achievement (grades) be predicted by selected cognitive and affective variables. The findings of the study lend further clarification to the prediction of classroom achievement. As expected, cognitive variables contribute to explaining variation in classroom grades, but the combination of cognitive and affective variables in a six predictor equation explain only 32% of the variation in grades. The authors conclude that moderate relationships between cognitive measures and classroom achievement should be accepted and future research might include personality characteristics in studies of differences in classroom achievement. Short reviews of the literature to date are included. (Author/SES)

ED 074430

Affective and Cognitive Correlates of Classroom Achievement:
Research for the Counselor¹

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Counselors have long recognized the failure of researchers to incorporate affective variables into their studies of student classroom performance. Predictions of student success based upon cognitive variables have thus far proven only moderately successful. In spite of this dilemma, the current interest in behavioral objectives and performance contracting rests upon a base which emphasizes cognitive measures.

We know that there are variations in student performance which cannot be adequately explained by existing cognitive measures. Many counselors feel that affective considerations such as the motivation to learn, which is itself a complex of attitudes, environments, and self-concept, must be studied in order to understand all the ramifications of the learning process. Even more importantly, the relationship between affective and cognitive variables should be examined further so that counselors and teachers can plan for successful learning experiences.

¹Paper presented at the American Educational Research Association Annual Meeting, Division E: Counseling and Human Development, New Orleans, February, 1973.

Support from the University of Connecticut Research Foundation under the National Science Foundation Grant #35-235 and the Computer Center under Grant #GJ-9 is greatly appreciated.

Special thanks are extended to the following people for their assistance in this project: Ed Boland, Frank Gross, Frank Taylor, Tony Torre and Leo Yaconiello.

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This paper will review several studies which have empirically examined the relationships between selected cognitive and affective variables. Studies concerned with correlates of general attitude toward school will precede those studies employing measures of attitude toward specific subject areas. Following this review, the methodology and results of the present study will be described.

General Attitude Toward School

In the area of overall attitude toward school, Jackson and Lahaderne (1967) measured the attitudes of 292 sixth grade Ss on the Michigan Student Questionnaire and the Student Opinion Poll II. Correlations between attitudes toward school and scholastic achievement, defined as classroom grades and standardized achievement test scores were found to be negligible; no sex differences were discovered. These findings contributed to Jackson's (1968) review of the literature which concluded that little significant relationship existed between attitude toward school and teacher grades. In another study Jackson and Getzels (1959) identified 55 satisfied and 47 dissatisfied one-freshman through senior high school Ss on the basis of 531 Ss' responses to the Student Opinion Poll. Analysis of data obtained from administering nine standardized cognitive (ability and achievement) and affective measures to the satisfied and dissatisfied Ss indicated that no significant differences between attitude groups were present for intellectual ability and academic achievement (grades were not used in this study). But satisfied Ss were significantly higher than dissatisfied Ss on several affective measures such as the California Personality Test (personal-social adjustment) and the Adjective Check List. Jackson and Getzels concluded that the attitudinal differences were clearly a reflection of personality characteristics.

Contrary to the findings of Jackson and Lahaderne (1967) and Jackson and Getzels (1959), several studies have reported significant relationships between general attitudes toward school and certain types of achievement. In a study of 92 eighth graders, Malpass (1953) found no relationship between attitude (Sentence Completion Test, School Pictures Test, and Personal Document Test) and achievement test scores (Stanford Reading and Arithmetic), but reported a significant relationship between overall attitude toward school and classroom grades (correlations of .57, .45, and .31 for three attitude measures). Similarly, Carter (1959) has reported correlations near $r = .60$ between attitude toward school (California Study Methods Survey) and grade point averages for two samples of tenth and eleventh graders.

Employing a different approach than the correlational studies previously reported, Brodie (1964) examined differences in achievement on the Iowa Tests of Educational Development for eleventh grade Ss identified as satisfied and dissatisfied with school. (Satisfaction-dissatisfaction was defined as being $1\frac{1}{2}$ standard deviations above or below the group mean on the Student Opinion Poll.) Satisfied Ss, especially females, significantly outperformed dissatisfied Ss in several achievement areas.

In light of Jackson and Getzels' (1959) suggestion that attitude toward school may be a reflection of personality characteristics, Williams (1970) administered the Bell Adjustment Inventory and the Tennessee Self Concept Scale to 130 high school Ss who were categorized as satisfied or dissatisfied with school (satisfied and dissatisfied were defined as being 1.3 SDs above or below the normative mean on the California Study Methods Survey attitudes toward school scale). Analysis of the personality data, along with measures

of intelligence, achievement, and teacher grades, indicated that the satisfied Ss scored significantly higher in the ability, achievement, and personality areas. Highly significant was Williams' further classification of the relationship between attitudes and personality characteristics. The satisfied and dissatisfied groups were first equated on the basis of intelligence scores. Following this, no achievement test differences were found, but the dissatisfied Ss were significantly below the satisfied Ss on all personality characteristics and on grade point average as well. Thus, it appears that personality characteristics are important considerations when studying attitudes toward school.

Attitudes Toward Specific Courses

An important consideration when examining the relationship between attitudes and achievement is the nature of the attitude measured. The studies mentioned thus far in this review have all dealt with general or overall attitudes toward school. After considering Jackson's (1968) review of research, Neale, Gill, and Tismer (1970) suggested that overall attitude toward school may not be related to achievement, but attitudes toward specific school subjects may be in that specific subject area. While their former suggestion is contrary to the several studies reviewed thus far, their hypothesis of relationships of attitudes in specific subjects to achievement in that area must be examined further. In their review Neale, et. al. (1970) point out that in studies done by Bassham, Murphy, and Murphy (1964) and Anttonen (1967) significant relationships were found between attitudes toward specific school subjects (math) and achievement in that subject. Neale, et. al. (1970) employed semantic differential techniques to obtain attitude toward school,

teacher, arithmetic, social studies, science, and reading scores for 215 sixth grade Ss. Correlations between the specific area attitudes, intelligence, and achievement (SRA Achievement Series) were generated. Significant correlations (from .27 to .35) between parallel attitude and achievement areas were found for males in social studies, arithmetic, and reading and for females in reading. Employing regression techniques to examine the manner in which intelligence, pre-test achievement and specific attitude could predict post-test achievement, Neale, et. al. (1970) found that pre-test achievement was consistently the best predictor; only in the case of males in arithmetic did attitude toward arithmetic contribute significantly to predicting post-test achievement.

Thus, in many studies of the type reviewed it is difficult to ascertain whether or not the distinguishing element in explaining the reported findings is whether it was overall attitudes toward school or attitudes toward specific courses which were studied. Whereas attitudes toward specific courses appear consistently correlated with achievement performance, they explain little variation in the regression of attitude on achievement (Neale, et. al., 1970). Also, the studies examining overall attitude toward school are contradictory and only tend to support the hypothesized relationship. Comparisons across studies are difficult and risky since different classroom achievement reinforcement models (competitive vs. non-competitive; Williams, 1970) as well as measuring instruments and sample characteristics have been employed.

Objectives

The general objective of this study was to further examine the relationships between cognitive and affective variables in the context of predicting

student achievement performance in the classroom. The specific objective was to examine the following two-part question: (1) To what extent, and (2) in what manner can classroom achievement (grades) be predicted by selected cognitive and affective variables?

Methods and Techniques

Instrumentation

The instrumentation employed consisted of the Watson-Glaser Critical Thinking Appraisal (Watson and Glaser, 1951), the Cooperative English Test (Reading Comprehension Section), Frymier's JIM Scale (Frymier, 1965), and the Gable and Roberts Attitude Toward School Subjects (GRASS) measure (Gable and Roberts, 1972). Final grades in social studies were also utilized. The Watson-Glaser Appraisal generated scores in the following areas: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. The Cooperative English Test yielded vocabulary, level of comprehension and speed of comprehension scores; the JIM Scale yielded a motivation toward school score which has been referred to as a measure of academic motivation since it usually correlates around .38 with grades. Frymier (1965) also reports that JIM Scale scores have been found to be significantly higher for overachievers than for underachievers (standardized achievement tests) and for groups of students identified by teachers as highly motivated. The attitude toward school subjects measure (GRASS) yielded two attitude toward social studies scores which were generated through a factor analysis. These were (1) general interest in, and (2) perceived usefulness of the subject. The content and construct validity and internal consistency reliabilities of the 23 Likert item attitude measure have been described by Gable and Roberts (1972).

Analyses

The extent of the relationship between the cognitive and affective variables and classroom achievement in social studies was examined by generating product moment and multiple correlations for selected sets of cognitive and affective variables and end-of-the-year grades in social studies. Finally, the manner in which cognitive and affective variables predicted classroom achievement was examined by performing a step-wise multiple regression analysis.

Data Source

The participants in this study consisted of 431 eleventh grade students from two high schools in a small city of approximately 46,000 people. The community served by these schools is essentially white middle class (blue and white collar) with one of the lowest per pupil expenditures in the state of Connecticut. Data was gathered on all measures except grades in September; final grades were obtained in June. The classroom situation could be classified as competitive with respect to achieving grades in courses.

Results and Discussion

Table 1 contains the intercorrelations, means, and standard deviations for the cognitive and affective predictors and the criterion variable (social studies grades). Inspection of the intercorrelations among the predictors indicates that, as expected, the inter- and intracorrelations for the cognitive measures (Watson-Glaser and Cooperative English) tend to be higher than the correlations between the cognitive and the affective measures. Also, while the attitude toward social studies measures (interest and usefulness) tend to be unrelated to any of the cognitive or affective predictors, motivation toward school was slightly related to the cognitive measures and unrelated to attitude toward social studies (interest and usefulness).

To examine the specific objective of this study, one must consider the relationships found between the cognitive and affective predictors and social studies grades. Inspection of the Table 1 entries shows that the highest correlations with grades were found for the cognitive Cooperative English scales: speed of comprehension ($r = .41, p < .01$) and vocabulary ($r = .40, p < .01$). But the affective measure, JIM Scale motivation toward school, was almost equally related to grades ($r = .40, p < .01$). While the remaining cognitive Cooperative English and Watson-Glaser scales were moderately related to social studies grades, attitude toward social studies: general interest and perceived usefulness were negatively related to grades. The negative correlation was puzzling as it suggests a tendency for an inverse relationship ($r = -.20, p < .01$) between one's perceived usefulness of social studies and his achievement in the classroom.

Table 2 presents the results of the step-wise multiple regression analysis. Of particular interest are the multiple correlations which, like the zero-order correlations presented in Table 1, indicate the extent of the relationship between a set of cognitive and affective variables and social studies grades. The combination of the increases in the multiple correlations to around .568 and the F values for the regression weights for variables which entered into the equation suggest that the most efficient equation would probably include the six predictors: speed of comprehension, motivation toward school, interpretation, perceived usefulness, vocabulary, and recognition of assumptions.²

²The weights for the six variable equation were as follows: .13, .10, .42, -.52, .16, and .27; constant = 55.31.

But still, this six predictor equation explains only 32% of the variation in grades (see Table 2, R squared).

It is important to note the manner in which the grades were predicted. The first variable was a cognitive one, but the second variable to enter the regression equation was the affective measure of motivation toward school. Thus, the contribution of affective variables in explaining the variation in classroom achievement is supported. But this conclusion must be clarified. The two affective measures employed in this study (motivation toward school and attitude toward social studies) were not empirically related to each other (see Table 1). Thus, one's academic motivation toward school, which is measured by the JIM Scale, contributes to the prediction of classroom achievement, but one's general interest in or perceived usefulness of the subject of social studies is either unrelated or inversely related to social studies grades.

Conclusions

The findings in this study lend further clarification to the prediction of classroom achievement. As expected, cognitive variables contribute to explaining variation in classroom grades. But the combination of cognitive and affective variables in the six predictor equation still only explain about 32% of the variation in grades. Also, if the general attitude toward school measures employed in several studies are similar to the JIM Scale, then some additional comparisons may be in order. (It may be that the JIM Scale represents more of a device for measuring academic motivation than any other quality. If this construct differs from the construct of general attitude toward school measures employed in other studies, any comparisons with these studies can be made only with the greatest caution). The significant

correlation of motivation toward school with social studies grades lend support to the studies by Malpass (1953) and Carter (1959), but are not in agreement with the findings of Jackson and Lahaderne (1967) or the review by Jackson (1968). Also, the lack of any significant relationship between the measures of attitude toward social studies and social studies grades is generally contrary to the findings of Bassham, et. al. (1964), Anthonen (1967), and Neale, et. al. (1970).

Thus, the distinguishing feature in explaining differences in reported findings does not appear to be whether or not general attitudes toward school or attitudes toward specific subjects was studied.

Perhaps the construct of motivation or attitude toward school reflects larger personality characteristics such as those studied by Jackson and Getzels (1959) and Williams (1970). In these two studies significant personality differences were found in favor of Ss satisfied with school. Perhaps we should accept the moderate relationships between cognitive measures and classroom achievement and give more thought to including several personality characteristics in studies which seek to explain differences in classroom achievement.

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Table 1

Intercorrelations, Means, and Standard Deviations
for Predictor and Criterion Variables¹

	RCAS	DED	INTRP	EVARG	MOF	VOC	LVCMP	SPCMP	INT	USE	SSGRD	MEANS	SD
VF	.22	.35	.43	.30	.26	.49	.45	.45	.03	-.02	.32	9.3	3.0
CAS		.23	.29	.22	.15	.18	.18	.23	-.08	-.03	.24	9.7	3.1
ED			.41	.19	.25	.37	.38	.42	.03	-.05	.24	16.1	3.3
INTRP				.26	.29	.40	.40	.42	.04	-.04	.38	15.6	3.5
EVARG					.16	.29	.25	.29	-.02	-.05	.16	8.1	2.5
MOF						.27	.37	.34	-.01	-.12	.40	115.2	20.9
VOC							.61	.71	.03	-.11	.4	14.6	8.2
LVCMP								.82	.11	.13	.	.8	5.9
SPCMP									.06	.01	.	5	10.7
INT										.31	-.06	.3	4.2
USE											-.21	3	2.8
SSGRD												78.6	9.3

VF = Inference

CAS = Recognition of Assumptions

ED = Deduction

INTRP = Interpretation

EVARG = Evaluation of Arguments

MOF = Motivation Toward School

VOC = Vocabulary

LVCMP = Level of Comprehension

SPCMP = Speed of Comprehension

INT = Interest

USE = Usefulness

SSGRD = Social Studies Grades

¹All correlations have been multiplied by 100. A correlation of $r = .10$ is significant at $p < .01$, $r = .13$ is significant at $p < .05$ for a sample of $N = 431$.

Table 2

Step-Wise Multiple Regression
Multiple Correlations and
Full Model Regression Weights¹

Step Number	Variable Entered	Mult R	SE Est.	df	Fa	R ²	Increase in R ²	Final b	Final SE b	Final F
1	SPCMP	.413	8.47	429	88.31	.171		.11	.07	2.31
2	MOT	.494	8.09	428	69.22	.244	.073	.10	.02	25.56 **
3	INTRP	.526	7.93	427	54.51	.277	.033	.41	.13	10.48 **
4	USE	.554	7.77	426	47.09	.307	.030	-.51	.15	12.03 **
5	VOC	.562	7.73	425	39.19	.316	.009	.15	.07	4.52 **
6	RCAS	.569	7.69	424	33.76	.324	.008	.28	.13	4.72 **
7	INF	.571	7.69	423	29.18	.326	.002	.21	.16	1.73
8	INT	.572	7.69	422	25.64	.327	.001	-.09	.09	.94
9	EVARG	.573	7.69	421	22.88	.328	.001	-.15	.16	.84
10	DED	.574	7.70	420	20.62	.330	.002	-.10	.13	.58
11	LVCMP	.574	7.70	419	18.74	.330	.000	.07	.12	.30
	Constant							59.17		

**p < .01

¹The 6 predictor equation was: SSGRD = .13(SPCMP) + .10(MOT) + .42(INTRP) - .52(USE) + .16(VOC) + .27(RCAS) + 55.3.

^aAll multiple correlations were significant at the p < .01 level.