THE VALIDITY OF THE DIFFERENTIAL APTITUDE TEST IN PREDICTING HIGH SCHOOL GRADES RELATIVE TO VOCATIONAL COURSES

BY

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THE VALIDITY OF THE DIFFERENTIAL APTITUDE TEST IN PREDICTING HIGH SCHOOL GRADES RELATIVE TO VOCATIONAL COURSES

A Research Paper

Presented to

the Graduate Council of

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In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in Education

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by

Robert Glenn Moorhead

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To the Graduate Council:

I am submitting herewith a research paper written by Robert Glenn Moorhead entitled "The Validity of the Differential Aptitude Test in Predicting High School Grades Relative to Vocational Courses." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts in Education with a major in Guidance and Counseling.

Harland E. Blair
Major Professor

Accepted for the Council:

Dean of the Graduate School

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CHAPTER I

INTRODUCTION

The rapid growth in the number and diversity of high schools has created a need for more valid forms of predictive instruments and guidelines to assist the student faced with the choice of either a vocational or an academic career. Students need to be given clear and objective information about their aptitudes in order to assist them in choosing their course of study or major emphasis at the high school level. Both the more able and less able students need assistance in choosing the curriculum that will be challenging and yet offer them an opportunity to successfully complete their program. The guidance counselors are aware of the needs for more efficient and valid methods of identifying those students who would be successful in vocationally oriented programs. Chauncey (1963) emphasizes this point in stating "wide scale programs in early high school years have immense value in the saving of national resources in human talent."

Test results are widely used by guidance counselors in advising students which curriculum they should enter. However, there appears to be a considerable amount of uncertainty as to the usefulness of tests in selecting students for vocational courses and for advising students concerning

their entry into such courses. The purpose of this study is to attempt to evaluate one multiple-test battery currently used in many school systems for such advisement. Among the tests now widely used for guidance, the Differential Aptitude Tests (DAT) has been used in thousands of high schools to give students some insight into the ways their skills are developing.

The Differential Aptitude Tests were designed for use in educational and vocational counseling with students in grades 8-12. The DAT is a battery of eight tests consisting of the following subtests: Verbal Reasoning, Numerical Reasoning, Space Relations, Abstract Reasoning, Clerical Speed and Accuracy, Language Usage, Mechanical Reasoning, and Spelling.

The DAT is considered a guidance tool rather than a teaching or selection instrument. Chauncey (1963) states "DAT scores never tell a student he should be anything, only that among his own academic and certain occupational skills there are some that seem to be more highly developed than others, and among a large group of students his own age, these skills have given ranking." Therefore, all the DAT will do is permit the student to compare his already-developed skill in an area with the skills of other students like him. The judgement about what he should become, the choice of courses and careers, still remain the student's.

The task of the educational and vocational guidance counselor is a very broad one. A counselor must consider

as many of the abilities and skills possessed by the counselee, as possible, to properly arrive at judgements as to which areas of endeavor would be the most promising. Weeks (1967) believes part of a counselor's responsibility is to provide objective and accurate information to the student to assist him in making choices.

Wilson (1963) feels advisement regarding success possibilities in a particular program should be based on objectively validated evidence. He advocates the use of validated prediction-devices in advising students. Hill (1963) recommends statistical procedures in preference to "armchair" type evaluations. He emphasizes the need for research in individual schools to secure accurate information on the value of predictive instruments used in the advisement of students. He states the only way any school can get accurate information regarding the value of its instruments is by completing its own statistical study.

The subjects in this study are students of a local high school. As appears to be the general trend, more and more students, in most high schools, are requesting enrollment in vocational classes. It is, therefore, becoming increasingly more important for the guidance counselor to be able to provide predictive information to students about their chances for succeeding in a vocational career.

An objective of this study was to determine the correlation coefficient between the scores attained on the

Differential Aptitude Tests, during the students' 9th grade, and those scholastic grades attained in high school vocational classes. Should such a correlation exist, thereby on the basis of such findings, develop a predictive information device for use by counselors in future decisions concerning students ability to achieve.

Relating correlation coefficients to teachers, parents, and any other interested individual would generally be of little value in their understanding of the meaning of the results. Therefore, another objective of this study was to interpret the results into meaningful information so it could be beneficial to the users through the application of expectancy tables.

Statement of the Problem

The purpose of this study was to test the validity of the variables available in the school cumulative records as measured by the Differential Aptitudes Tests for predicting aptitudes or abilities in any subsequent vocational career subjects. Since it is generally found that variables do not do an equally good job in prediction of any given criteria, the validity of each variable, by sex, was determined to establish which ones were the best predictors of future achievement in vocational subjects.

Hypotheses

1. There is no significant correlation between the scores earned on the DAT compared to progress grades earned

by females enrolled in vocational classes.

2. There is no significant correlation between the scores earned on the DAT compared to progress grades earned by males enrolled in vocational classes.

Limitations of the Study

1. The study was confined to students presently enrolled in vocational courses at Clarksville High School, Clarksville, Tennessee.

2. No attempt was made to include the socio-economic level of students used in the study. It was assumed random selection of students from cumulative records would be of sufficient control to equalize the effect of this variable.

3. The number of the students included in the study who attended Clarksville High School and are presently enrolled in vocational courses was small, approximately fifty-seven, but the sample included all students whose cumulative records reflected the necessary DAT data.

CHAPTER II

REVIEW OF RELATED LITERATURE

In determining the more valuable tool for sound educational and vocational guidance, Bechtoldt (1953) suggested the basic hypothesis used in the development of the Differential Aptitude Test (DAT) is the appraisal of each of several "abilities" will enable vocational and educational counselors to form realistic judgements as to the educational curriculum appropriate to the skills of students and reasonable judgements as to which students should take each course. Just how adroitly vocational counselors may use the DAT without understanding test analysis is difficult to understand.

Various counselors administering the Differential Aptitude Test will probably acquire a "desired need" for more empirical knowledge of the relationship between the predictors since the evaluation techniques currently used in high schools suggest little or no more differential prediction. As a result, the unsatisfactory definitions of such terms as "success on the job" may lead to the conclusion that the current criteria does not manifest a differential prediction in either educational o vocational activities.

Berdie (1953) contends the tests may have useful

validities for counseling high school students on the basis of existing data. Such a statement cannot be made about any other existing aptitude test. He also states some validity has been attained in predicting success in high school courses, also some evidence concerning their validity in vocational success.

There appears to be a controversy as to whether the DAT is really "Differential", i.e., do the tests really measure the different abilities? Carrol (1959) states the proportion of differences between the standardized test scores or any pair of tests, in excess of the chance proportion, have been expounded on by the author of the DAT. He considered the validity data purely predictive, being derived from a situation where the test was given prior to the collection of course grades and therefore having a direct bearing on the decisions made by the guidance counselors that might have been otherwise, if taken, at the time the tests were given.

Fredericksen (1959) stresses the user of Differential Aptitude Tests be encouraged to use local data for the development of expectancy table in order to find out how the DAT works in his own pecular situation.

Carrol (1959) stated that in the array of coefficients presented by the authors of the DAT there is not a case of multiple correlation. It appears the authors are reluctant to get the counselor into needless complexities but in view of the importance of such decisions to the individual as to

whether to plan on either liberal or technical studies would it not be feasible to provide the counselors with a simple means of combining scores in order to make better predictions of accuracy?

Frederiksen (1959) elaborated the point of some publishers of multifactor test batteries advocating the use of combinations of certain scores attained on their tests for specific purposes. The DAT authors do not support such a practice but do emphasize the practice of counseling from profiles. Such a rule of thumb has allowed counselors to make only cautious interpretations of students abilities.

Frederiksen (1959) concedes that such a clinical approach has merits and must be used in many situations. But in order to take full advantage of a multitest battery, a counselor should also utilize statistical methods to best discover how to combine scores for use in certain important problem situations.

Keats (1965) supports Frederiksen's opinion regarding the absence of multiple correlations in the validity data presented by the authors of the DAT. He considers if such data were available, it would greatly assist a counselor in establishing the guidance program most efficient for his own particular purpose, whereas if multiple correlation data were available, on a selection of the tests, the administration of a sub-battery of tests would prove just as efficient.

Schultz (1965), also stressed the fact that no use has

been made of multiple regression and discriminant analysis procedures in establishing the validity of the various tests contained in the DAT. Thus, despite the extensive predictive validity coefficients for separate DAT subtests, the "differential" validity of the tests in predicting various criteria is still without substantiation.

CHAPTER III

PRESENTATION OF DATA

Subjects

The subjects who participated in this study were 48 tenth-grade students, enrolled in vocational classes, from Clarksville High School, Clarksville, Tennessee. All subjects were randomly selected and considered for incorporation in this study. Each subject had been administered the Differential Aptitude Tests during their ninth grade while at Greenwood Annex.

All subjects were sampled from each of three hetrogeneously grouped classes. The classes included in the study were: Machine Shop, Metal Shop, and Cosmotology. There were twenty-nine males and nineteen females, both black and white representatives, involved in the study.

Table 1

Number, Race, and Sex of Subjects

Sex	Black	White	Total
Males	2	27	29
Females	4	15	19
Total	6	42	48

Apparatus

The Clarksville High School cumulative record of each student provided the prediction variables of the Differential Aptitude Tests. The criterion used in this study was based on the appraisal of each variable to form a realistic judgement as to the educational curricula appropriate to the skills of the students.

The DAT battery is composed of eight independent tests as follows: Verbal Reasoning (VR); Numerical Ability (NA); Abstract Reasoning (AR); Clerical Speed and Accuracy (CSA); Mechanical Reasoning (MR); Space Relations (SR); Spelling (Spell); and Language Usage (LU). The examinee's scores on VR and NA are summed together to form an additional score, VR+NA, a measure of general scholastic aptitude.

The Psychological Corporation (1972) described the Differential Aptitude Tests as being devised to serve as a measure of the abilities of students in grades 8 through 12. They conclude that the battery is also helpful in counseling both college-bound and non-bound college students.

One purpose of the tests, according to the authors, is to allow for selection of sub-tests appropriate to specific needs and allow guidance counselors to maximize predictions. This was one purpose of this study.

Procedure

Data were collected from the school cumulative record of forty-eight 10th grade students who attended Clarksville

High School, Clarksville, Tennessee. The score each student made on the eight individual tests of the Differential Aptitude Test was recorded.

The first step in the plan for analyzing the data was to measure the extent of relationship between each of the individual predictors. The score each student earned on the specific individual sub-tests of the Differential Aptitude Test was recorded. The Pearson product moment correlation coefficient was then performed on each category of data to determine the validity of the predictors as a criteria. Distinction between sex and classes required separate correlations.

Another criteria considered was the final grades earned by each of the students in the particular vocational course presently enrolled. The degree of success of each student was recorded on the locally established numerical value of letter grades (A=95-100, B=88-94, C=75-87, D=65-75, F= Below 65). The range of each letter grade, as determined by the particular students' instructor, was pro-rated on the basis of "average" equaling the mean, "above average" equal to the top one-third, and "below average" equal to the bottom one-third of the grades' range.

A third criteria was obtained by performing a Pearson product moment correlation coefficient between the grade criteria and the individual predictors of the Differential Aptitude Test.

On the basis of a suspected relationship between two

variables for each category, by sex, (Machine and Metal Shop and Cosmotology) correlation charts were constructed. A "best fit line" was calculated by means of a regression equation. Based on the data utilized for the Pearson product moment correlation coefficient, a "slope constant" and a Yl "intercept" constant was determined. Having obtained the necessary constants to calculate a regression equation the Yl conditional was determined for two values of the predictor.

A standard error of estimate was calculated by first obtaining a standard deviation of the grade criteria. Confidence limits, at the .05 level of confidence, was constructed on either side of the regression line.

A multiple correlation was performed on the data obtained from the three individual criteria to determine how well the criterion available (progress grades) could be predicted from an optimal combinations of the predictors selected from the Differential Aptitude Test.

The second phase of the study consisted of preparing expectancy tables from the data collected on each of the groups. The purpose of the expectancy tables were to provide a workable means for interpreting the results of the study to high school students and their parents. An expectancy table was prepared for (a) the Mechanical Reasoning sub-test for predicting Machine and Metal Shop progress grades, (b) the Abstract Reasoning sub-test for predicting Machine and Metal Shop progress grades, (c) the Verbal

Reasoning plus Numerical Ability sub-test for predicting Cosmotology progress grades, and (d) the Abstract Reasoning sub-test for predicting Cosmotology progress grades.

A chief limitation of the expectancy table is that it displays the predictive value of only one predictor at a time (Wesman, 1966). A double-expectancy table was prepared for each group allowing for a simultaneous observation of the relationship between the two predictors and a criterion. These tables reveal the predictions made for Machine and Metal Shop and Cosmotology progress grades when the two predictors obtained from the Differential Aptitude Tests, for each of the groups, are shown jointly, rather than separately.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATE

Data were collected from the high school cumulative records of forty-eight 10th grade students who attended Clarksville High School, Clarksville, Tennessee and presently enrolled in a vocational type class. The students were divided into two groups. Group I was composed of twenty-nine male students enrolled in Machine and Metal Shop course. Group II was composed of nineteen female students enrolled in Cosmotology. The final progress grade for each student was obtained from the appropriate vocational instructor.

To establish a predicted criteria for progress grades, a numerical value was established for letter grades. Each letter grade has a locally accepted group of scores (A=95-100, B=88-94, C=75-87, D=65-74, and F=Below 65). In order to obtain a wider spread and a more specific score, individual groups were further pro-rated into three categories, "above average, 'average', and below ." The range of each group was divided and an equal one-third assigned each category.

The Pearson product moment correlation coefficient was used to determine the maximum validity of progress grades with selected predictor scores recorded for the Differential Aptitude Tests. Separate correlations were calculated for

group of subjects. Table 2 presents the data from this analysis.

Table 2

Correlation of Progress Grades and Selected DAT Predictors

Grades	VR+NA	AR	MR	SR
Male	.17	.40*	.56*	-.02
Female	.44	.44	.02	.17

*Significant at the .05 level of confidence.

Table 2 indicates Mechanical Reasoning (MR) was a better predictor for males in determining the attainment of an appropriate progress grade, with a correlation coefficient of .56 significant at the .05 level of confidence. For purpose of computing a multiple correlation, Abstract Reasoning (AR) was also considered as a variable, with a correlation coefficient of .40 significant, also, at the .05 level of confidence.

The correlation coefficients for females are not significant at the .05 level of confidence and therefore could be abandoned from the study at this time. With consideration given to the size of Group III (19) and the obtained correlation of .44 approximate to the tabled value of .456 decision was in favor to retain this portion

in the study for further comparison and reference. For the computation of a multiple correlation, both Verbal Reasoning plus Numerical Ability (VR+NA) and Abstract Reasoning (AR) were considered as appropriate variables.

The Pearson product moment correlation coefficient was used to determine the validity of the predictors contained in the Differential Aptitude Tests. Separate correlations were calculated for each group. Table 3 presents the data from this analysis.

Table 3

Correlation Between DAT Predictors

Group	Predictors	"r"
I	AR vs MR	.62
	MR vs VR+NA	.70
	SR vs AR	.40
II	MR vs AR	.84
	AR vs VR+NA	.88
	SR vs AR	.57

As can be noted in Table 3, for Group I, the correlation coefficient of .70 between Mechanical Reasoning (MR) vs Verbal Reasoning plus Numerical Ability (VR+NA) and Abstract Reasoning (AR) vs Verbal Reasoning plus Numerical Ability (VR+NA) for Group II represents the maximum validity between

the selected predictors contained in the Differential Aptitude Tests. To limit the variables in the computation of a multiple correlation to three, the correlation coefficient of .62 between Abstract Reasoning (AR) vs Mechanical Reasoning (MR) for Group I was substituted for the validity coefficient of .70.

A multiple correlation coefficient was performed to test the validity of predicting progress grades from an optimal combination of selected predictors from the DAT. Separate multiple correlation coefficients were calculated for each group. For Group I, the variables; progress grades, Mechanical Reasoning, and Abstract Reasoning reflected a validity coefficient of .55 significant at the .05 level of confidence. For Group II, the variables; progress grades, Verbal Reasoning plus Numerical Ability, and Abstract Reasoning reflected a validity coefficient of .457, barely significant at the .05 level of confidence.

A device is needed which can simply and directly reveal the relationships between test scores and performance measures to those who lack the necessary background to understand even the more commonplace statistical terms such as correlation, standard deviation, and variance (Wesman, 1949). In order to make the most practical application of the data collected in counseling high school students and their parents, simple expectancy tables were prepared for each variable for each of the two groups predicting students' future performance in vocational subjects. The

percentage of students in Group I with regards to their Mechanical Reasoning scores and final progress grades are presented in Table 4. The other variable, Abstract Reasoning, for Group I with regards to their final progress grade is presented in Table 5.

Table 4

Expectancy Table Showing the Relation Between Mechanical Reasoning Scores and Final Progress Grades (Group I)

MR Raw Scores	Percentage in Each Score Group on Final Progress Grades				
	50-64	65-74	75-87	88-94	95-100
60-70				100	
50-59				50	50
40-49			29	71	
30-39		8	50	33	8
0-29		50	17	33	

As can be noted in Table 4, 50 percent of Group I who earned Mechanical Reasoning raw scores between 0 and 29 failed to maintain an "average" grade, but only 8 percent of the students whose Mechanical Reasoning raw score was 30 to 39 and none whose Mechanical Reasoning raw score was 40 or better failed to maintain an "average" or satisfactory grade. It is apparent that a student's progress grade increases as Mechanical Reasoning scores increases. Therefore, a 9th

grade male with a raw score of 30 to 39 or above on Mechanical Reasoning has a 50 percent chance to earn an average grade of 75 to 87 (C) or better in a Machine and Metal Shop course since 50 percent of his score group earned grades on that range.

Table 5

Expectancy Table Showing the Relation Between Abstract Reasoning Scores and Final Progress Grades (Group I)

AR Raw Scores	Percentage in Each Score Group on Final Progress Grades				
	50-64	65-74	75-87	88-94	95-100
45-50					
35-44				100	
26-34		9	27	46	18
14-25			40	50	10
0-13		33	34	33	

Table 5 presents the percentage of students represented in Group I with regards to their Abstract Reasoning and their final progress grades. Similar to the preceding table, 33 percent of Group I who earned an Abstract Reasoning score of 0 to 13 score bracket failed to qualify for an "average" progress grade, and only 9 percent above the score of 26 failed to maintain a satisfactory score. The students whose scores on Abstract Reasoning were between 14 and 25 did as

well or better than the students whose scores were 26 to 34. This would appear to suggest that for the students of Clarksville High School, Abstract Reasoning scores between 14 and 34 should not be considered as being highly selective for predicting final progress grades. Knowledge of this nature would make it practically imperative to perhaps consider variables other than Abstract Reasoning when counseling students.

For Group II, the percentage of Cosmotology students with regards to their Abstract Reasoning scores and final progress grades are presented in Table 6. The other variable utilized in the multiple correlation equation, Verbal Reasoning plus Numerical Ability, depicts the similar information in Table 7.

Table 6

Expectancy Table Showing the Relation Between Abstract Reasoning Scores and Final Progress Grades (Group II)

AR	Percentage in Each Score Group on Final Progress Grades				
Raw Scores	50-64	65-74	75-87	88-94	95-100
44-50					
35-43			29	42	29
26-34			50	50	
13-25			50	33	17
0-12			50	50	

As can be noted in Table 6, Abstract Reasoning scores for Group II between 26 and 34 do not seem to predict academic achievement any better than do scores of 0 to 12. Regardless of Abstract Reasoning score, a student was able to attain a satisfactory final progress grade. This data is in agreement with and supports the data shown for Group II in Table 2. When interpreting expectancy tables based on a small number of cases, like Group II of only nineteen students, predictions must be regarded as highly tenative.

Table 7

Expectancy Table Showing the Relation Between Verbal Reasoning plus Numerical Ability and Final Progress Grades (Group II)

VR+NA Raw Scores	Percentage in Each Score Group on Final Progress Grades				
	50-64	65-74	75-87	88-94	95-100
74-90					
47-73			33	34	33
30-46			17	66	17
19-29			57	29	14
0-18			67	33	

This data for Group II presented in Table 7 depicts the Verbal Reasoning plus Numerical scores to be concurrent with Table 6. As noted, in both tables, scores are not progressively selective. Students with scores of 0 to 18

would have a better chance of earning a satisfactory progress grade than students with scores of 19 to 29. In view of the fact that in this particular study Abstract Reasoning (AR) and Verbal Reasoning plus Numerical Ability (VR+NA) scores were not sufficient to be significant in correlation with final progress grades, it would be necessary to rely more heavily on judging a student's potential in Cosmotology in terms of other evaluation means.

All too frequently, the person making the judgement is not aware that he is combining the available information in different ways for different counselees or applicants. Clearly, if reliable judgements are to be made, a more nearly uniform method of handling the available fact is highly desirable. What is needed, then, is a device which will not only present the facts which form the basis for prediction, but which will also make it easy to communicate those facts. Such a device is the "double-entry expectancy table" (Wesman, 1966).

Table 8 presents the information obtained from a double-entry expectancy table on the relationship between the two predictors and a criterion for the Machine and Metal Shop (Group I) used in this study. This table presents the percentage of students represented in the study with regards to their final Vocational progress grades when the Mechanical Reasoning (MR) and the Abstract Reasoning scores are considered jointly as predictors.

Table 8

Double Expectancy Table Showing Final Vocational Progress Grades Based on Mechanical Reasoning and Abstract Reasoning Scores (Group I)

AR Raw Score			Mechanical Reasoning Raw Score				
			0-29	30-39	40-49	50-59	60-70
		**					
		A					
		B					
45-50	*PG	C					
		D					
		F					
		A					
		B		50			50
35-44	PG	C					
		D					
		F					
		A				100	
		B		40	20	20	20
26-34	PG	C		33 1/3	66 2/3		
		D	50	50			
		F					

*Final Vocational progress grades

**A-95-100; B-88-94; C-75-87; D-65-74; F-0-64

Table 8 (continued)

AR Raw Score			Mechanical Reasoning Raw Score 0-29	30-39	40-49	50-59	60-70
		A		100			
		B	20	20	60		
14-25	PG	C	25	75			
		D					
		F					
		A					
		B	50		50		
0-13	PG	C		100			
		D	100				
		F	100				

Comparative scores were established for both Mechanical Reasoning and Abstract Reasoning using the Percentile Norm Table 2 of DAT Manual (1974) as a basis for determination. The final progress grades were paralleled to the two predictors as corresponding in value and structure.

It can be noted in Table 8 that scores were not progressively selective and students failed to earn a satisfactory progress score in the lower segments of either predictor. It was only when the Abstract Reasoning scores were 14 to 25 and Mechanical Reasoning scores 30-39 that a tendency toward a satisfactory progress grade was attained.

It is noteworthy, too, (Table 8) that Abstract Reasoning scores 26-34 and Mechanical Reasoning scores 30-39 do not seem to predict academic progress any better than do the lower segments of both predictor scales. In view of the lack of continuous significant correlation with final progress grades, it would be advantageous for counselors to consider additional evaluation data.

Table 9 presents a similar display for Cosmotology (Group II). The two predictors, Abstract Reasoning (AR) and Verbal Reasoning plus Numerical Ability (VR+NA) illustrate the percentage of students represented in the study with regards to their final vocational progress grades.

Table 9

Double Expectancy Table Showing Final Vocational Progress Grades Based on Abstract Reasoning and Verbal Reasoning plus Numerical Ability Scores (Group II)

AR Raw Score			VR+NA Raw Score 0-18	19-29	30-46	47-73	74-90
		**					
		A					
		B					
44-50	*PG	C					
		D					
		F					

Table 9 (continued)

AR Raw Score			VR+NA Raw Score 0-18	19-29	30-46	47-73	74-90
		A			50	50	
		B			100		
35-43	PG	C		50			
		D					
		F					
		A					
		B		50		50	
26-34	PG	C		50	50		
		D					
		F					
		A		100			
		B	50		50		
13-25	PG	C	66 2/3	33 1/3			
		D					
		F					
		A					
		B		100			
0-12	PG	C		100			
		D					
		F					

Table 9 (continued)

*Final Vocational progress grades

**A-95-100; B-88-94; C-75-87; D-65-74; F-0-64

Data presented in Table 9 is consistent with the data contained in Tables 2, 6, and 7 concerning the feasibility to use DAT variables as predictors for final progress grades for Group II. As previously illustrated, scores are not progressively selective. Therefore, emphasis must be placed on the necessity of the counselor to seek either additional or different data to judge a student's potential in Cosmotology.

CHAPTER V

SUMMARY AND CONCLUSIONS

The primary purpose of this study was to test the validity of the Differential Aptitude Test variables, annotated on the school cumulative record, for predicting aptitude in any subsequent vocational career subjects. A secondary purpose was to develop expectancy tables for better understanding and interpretation of the results. Forty-eight 10th grade students attending vocational courses from Clarksville High School, Clarksville, Tennessee, were selected as subjects for the study. The subjects were divided into two groups. Group I, with twenty-nine male students, was composed of those students presently enrolled in Machine and Metal Shop courses; Group II, with nineteen female students, was composed of students presently enrolled in Cosmotology.

The prediction variables of Abstract Reasoning (AR) and Mechanical Reasoning (MR) were selected for Group I. Abstract Reasoning (AR) and Verbal Reasoning plus Numerical Ability (VR+NA) were selected as prediction variables for Group II. Selection of variables for both groups were determined through process of elimination by obtaining those with the highest correlation coefficient. Limitation of two variables per group was maintained for the most

optimum in computation of multiple correlation. The criterion was the final progress grade for the vocational course which was obtained from the appropriate vocational instructor.

The Pearson product moment correlation coefficient was computed to determine the relationship of the two selected DAT variables to the final progress grades for each group. Correlation charts were constructed for each DAT variable and a "best fit line" determined by means of a regression equation based on the calculated constants, Y^1 "intercept" and "slope constant". Confidence limits, at the .05 level of confidence, was constructed on the correlation charts to reflect a standard error of estimate.

The data from the three variables for each group was used to construct a multiple correlation coefficient to determine the correlation between final progress grades and the combined use of the selected DAT predictors. After correlating the data, single expectancy tables were prepared on each of the four selected variables to provide a workable means for interpretation of results of study.

Two hypotheses were formulated as follows: (1) There is no significant correlation between the scores earned on the DAT as compared to final progress grades earned by male students enrolled in vocational classes; (2) There is no significant correlation between the scores earned on the DAT as compared to final progress grades earned by female

students enrolled in vocational classes.

A statistical analysis of the data allowed for the following conclusions:

1. There was a significant correlation between the scores earned on the DAT as compared to final progress grades earned by male students enrolled in vocational classes. Although this conclusion is substantiated by tabled values contained in Introduction to Statistics for the Behavioral Sciences (1969), it should be noted that further correlations and expectancy tables deem it necessary to accept the formulated null hypothesis with supportive explainations given in item 4 of the subsequent section, "Need for Further Research."

2. There was no significant correlation between the scores earned on the DAT as compared to final progress grades earned by female students enrolled in vocational classes. The null hypothesis formulated at the beginning of the study, for this phase of study, was accepted.

The conclusions of this study would definitely indicate that there is a low degree of predictability of final progress grades to selected predictors contained in the Differential Aptitude Tests. Data from the expectancy tables, single and double, indicate a lack of continuous significant correlation and a necessity for the consideration of additional variables by counselors when judging a student's future potentials.

Need for Further Study

1. Further research is recommended to study variations in types of grades given by individual instructors. More supportive data could be obtained by combining several classes and thus increase the number of subjects represented in a study.

2. Research is recommended in the area of establishing rating data based on traits approved by vocational instructors. Sufficient categories to be established for each trait and be combined on a rating form. The same rating scales to be used in all schools as a criteria for further studies and pupil guidance.

3. Research on a training and discussion conferences with vocational instructors regarding manner of compiling data for rating scale and the establishment of scheduled intervals for purpose of testing would provide information relevant to this study.

4. Research is recommended for a comprehensive testing program for the purpose of guidance and evaluation. Such a program would include a general measure of ability, measurements of special aptitudes, an interest inventory, and some measure of achievement in basic areas relevant to a selected vocational career. These tests will be administered and recorded on cumulative records during a student's high school career, with each being scheduled when it can most effectively contribute to the type of decision being made by student and counselor. At the present, insufficient

data is obtainable from cumulative records to substantiate opinions of counselors.

5. A multiple regression procedure should be established to predict success in vocational courses using DAT scores with other variables or rating scales.

6. Variables such as attitudes, study habits, and self-concept should be studied for their predictive ability.

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