DOCTORAL DISSERTATION SERIES

TITLE DETERMINATION OF THE PREDICTIVE RELATIONSHIP OF SELECTED FACTORS TO THE SCHOLASTIC ACHIEVEMENT OF 456 VETERANS WITH SERVICE-CONNECTED DISABILITIES

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UNIVERSITY OF MICH. DATE 1951

DEGREE Ed. D. PUBLICATION NO. 3477



UNIVERSITY MICROFILMS
ANN ARBOR · MICHIGAN

DETERMINATION OF THE PREDICTIVE RELATIONSHIP OF SELECTED FACTORS TO THE SCHOLASTIC ACHIEVEMENT OF 456 VETERANS WITH SERVICE-CONNECTED DISABILITIES

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree
of Doctor of Education in the
University of Michigan

Ann Arbor, Michigan
1951

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ACKNOWLEDGMENTS

To those persons whose valuable assistance made possible this study, the writer wishes to express his sincere appreciation. He is particularly indebted to Professor Harlan C. Koch, whose generous help and guidance over a period of years have contributed so materially toward the completion of the project. To the other members of the doctoral committee, sincere thanks are tendered for their continued interest in the project and for their basic suggestions, as the study progressed.

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CHAPTER I

THE PROBLEM AND METHODS OF PROCEDURE

INTRODUCTION

Inasmuch as World War II demanded that the nation mobilize and train millions of men to become successful fighting units, peacetime demobilization placed upon the nation a heavy obligation to assist these veterans in a satisfactory conversion to their rightful civilian status with careful regard for their educational and occupational adjustments and their related social and emotional problems. Hundreds of thousands of these young men were disabled as a result of their military service and after returning to civilian life needed some type of rehabilitation training which would assist them in becoming useful members of society.

As a means of aiding these disabled veterans in their rehabilitation, in 1943 the 78th Congress of the United States enacted Public Law 16. This law provided for the vocational rehabilitation of any eligible veteran who had a pensionable disability and who was in need of vocational rehabilitation to overcome the handicap of such disability.[1]

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[1]Ira D. Scott and Clyde J. Lindley, "The Advisement and Guidance Program of the Veterans Administration," American Psychologist, I (June, 1946), 190-200.

During their period of military service the vast majority of veterans lost contact with the civilian world of work, and in readjusting to civilian life it was necessary for them to become oriented to vocational and educational trends as they related to the selection of an occupational career. This was especially true in the case of disabled veterans, for in many instances their disabilities necessitated training for occupations entirely different from the careers they had planned prior to entering the armed services.[1]

To provide this service for veterans, in 1944 the Veterans Administration in cooperation with colleges and universities organized an advisement and guidance program. Veterans eligible for education or training under the provisions of the Servicemen's Readjustment Act (Public Law 346) were encouraged to request counseling and guidance services, while those services were made mandatory for disabled veterans desiring to pursue an educational program under the provisions of Public Law 16.

During the writer's association with the Veterans Administration's Advisement and Guidance Program, one of the critical problems he encountered concerned those disabled veterans who were desirous of enrolling in institutions of higher learning to prepare for professional

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[1]E. G. Williamson and R. J. Strom, "The Disabled Veteran In College," School and Society, LXVII (May 29, 1948), 399.

careers. Counseling with this type of client involved the predicting of academic success and scholastic achievement. It is this phase of the veteran's educational program that the present study is designed to investigate.

STATEMENT OF PROBLEM

The specific problem with which this study is concerned is the determination of the predictive relationship of selected factors to the scholastic achievement of 456 veterans with various service connected disabilities. The study was undertaken to gain an indication of the value of certain variables, utilized in the counseling of disabled veterans, for the prediction of course grades and grade-point averages during the veteran's college or university program.

NEED FOR THE STUDY

In view of the Korean War and the present international situation which may result in this nation's being faced with the problem of training thousands of additional disabled veterans, it would appear that studies of this type are critically needed at the present time.

While innumerable follow-up studies of the educational progress of high school and college youth have been conducted, comparatively few attempts have been made to study the scholastic achievement of disabled veterans who, subsequent to the termination of the hostilities of World War II,

enrolled in various colleges and universities under the provisions of Public Law 16. The comparatively short period of time this program has been in operation, the limited amount of research which has been carried on in connection with the program, and the absence of any precedent in the counseling of large numbers of disabled adults have frequently resulted in the utilization of a trial-and-error method by counselors in their endeavor to analyze and evaluate accurately a disabled veteran's background with respect to predicting his chances for academic success in a college or university. It would appear, therefore, that a real need exists for the conducting of research in this area in an effort to determine the value of certain variables for predicting the academic success and scholastic achievement of disabled veterans.

It has been estimated that there are approximately eight million males and an undetermined number of females in this country who are disabled to the extent of requiring some type of rehabilitation in order to become satisfactorily employed.[1] Eight million disabled persons is a very significant number and constitutes one person in sixteen of the general population and at least one in seven of the working population. When one considers the fact that this number may be considerably increased by

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[1]Wilma T. Donhaue and Clark Tibbitts, "The Task Before the Veteran and Society," Annals of the American Academy of Political and Social Science, I (May, 1945), 1-9.

thousands of veterans disabled in the Korean campaign, it is realized that the education and rehabilitation of disabled veterans is a timely problem and consequently deserves thorough study.

DELIMITATIONS

It has been necessary to make certain delimitations in this study. The subjects selected have been limited to those honorably discharged veterans of World War II who were granted disability compensation as a result of a service-incurred or service-aggravated disability. Secondly, the study concerns only those disabled veterans of World War II who from 1944 to 1946 applied for a course of education or training, received counseling services and enrolled in a college of university within the State of Michigan, under the provisions of Public Law 16 of the 78th Congress. It was necessary to limit the study to those disabled veterans who entered a college or university prior to 1947 in order to have available for analysis complete data concerning the veteran's educational progress and scholastic achievement. Thirdly, the criteria of success utilized in the study have been restricted to course grades and grade-point averages. It is realized that instructors' grades are not so objective or satisfactory a type of criteria of scholastic achievement as is desirable, and cognizance has been taken of the fact that an individual's educational adjustment, in all probability,

is affected by many additional factors. However, scholastic achievement continues to be judged almost entirely on the basis of grades, and for want of better criteria, grades and grade-point averages have been utilized as indicated.

FACTORS SELECTED FOR STUDY

Several rather critical factors are involved in the present study. The following appear to be the most significant:

1. To what extent, if any, is scholastic achievement affected by the type, or degree of severity of the veteran's disability?

2. Of what significance are the veteran's age, marital status and number of dependents in predicting scholastic success?

3. Are employment or service experiences significant?

4. What factors in the veteran's high school background are related to his scholastic achievement in an institution of higher learning?

5. Of what importance in predicting academic success are such factors as the length of time the veteran devoted to service and his military rank at the time of discharge from the armed services?

6. What is the significance of a disabled veteran's interest patterns for the differential prediction of course grades?

7. To what extent can the results of psychological tests be relied upon in predicting scholastic achievement of disabled veterans?

These are the major factors that the present study is designed to investigate.

PROCEDURE

The plan of procedure for the initial phase of the study involved the following steps:

1. Various items of data pertaining to the subjects' background were collected, tabulated, analyzed, and coded.

2. The subjects' college scholastic achievement was correlated with such quantitative variables as the results of psychological tests, high school grades, number of months the subjects devoted to the armed services, the kind and degree of severity of the subject's disability, his age, marital status, and number of dependents.

3. These coefficients of correlation were analyzed in an effort to determine which factors were significantly related to scholastic achievement.

4. Through the utilization of a tetrachoric method, coefficients of correlation were obtained between grades in specific courses and such variables as the results of the Kuder Interest Inventory, high school subjects liked best, employment experience, and such military experience as had occupational significance.

5. Multiple correlation coefficients were computed to determine the relationship of certain combinations of variables to the criteria of achievement; that is, to scholastic marks and honor-point averages.

Before proceeding with a statistical analysis of the findings of the present investigation a review will be made of some other studies which may have a bearing upon our own. A summarization of these research findings is presented in the following chapter.

CHAPTER II

OTHER STUDIES OF PREDICTION OF INTEREST TO THE PRESENT INQUIRY

The prediction of scholastic achievement on the college level has attracted wide attention. At this level the vast majority of studies pertain to high school and college youth who enrolled in institutions of higher learning prior to the beginning of World War II. While innumerable studies have been made of veterans' education under the Serviceman's Readjustment Act (Public Law 346), comparatively few of these investigations deal with the prediction of college scholarship of veterans and only a very limited number specifically concern disabled veterans.

Therefore, in order to review adequately the research findings related to the present study, it was necessary to examine pertinent investigations conducted in three different areas of educational research. In summarizing these research findings, the first part of this chapter deals with those studies concerning veterans as college students. The second phase pertains to the prediction of general scholarship, and the third, to the differential prediction of scholarship.

VETERANS AS COLLEGE STUDENTS

Clark[1] studied 889 male students at Northwestern University, 591 veterans and 298 non-veterans. The two groups were equated with respect to central tendency and variability for both high-school standing and scholastic aptitude test scores. In the background material concerning the two groups the investigator found that the veterans came from a less privileged environment. Their parents were less often college trained and were more often of foreign birth. They more frequently represented lower occupational groups, had more children, and were less likely to send their children to private secondary schools. The non-veterans were better prepared to succeed in college. They had more high school academic units, more language and mathematics. The non-veteran was also thirty-four months younger than the veteran. The veterans were a little lower in central tendency and variability for high school standing, but a little higher in both central tendency and variability of scholastic aptitude test scores. The semester hours of work undertaken were the same for both groups. For the first quarter of their freshman year, the grade-point average for the veterans was 3.79 compared with 3.48 for the non-veterans. The investigator interpreted this difference as indicative of

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[1]Edward L. Clark, "Veterans As College Freshmen," School and Society, LXVII (September 13, 1947), 205-07.

the fact that the veterans were better motivated and worked a little harder than non-veterans.

Thompson[1] studied 2,020 veterans and 5,887 civilian undergraduate students at Ohio State University for the winter quarter 1946. He found the median point hour ratio of veterans was about one eighth of a letter grade higher than for non-veterans. The veterans obtained about 7 percent more grades of B or better and had about 7 percent below the grade requirements for graduation. The study did not take into account such factors as comparative ability, maturity, and previous academic records of the two groups.

Tibbitts[2] investigated the academic achievement of 857 male veterans and 846 male non-veterans enrolled in the University of Michigan in the fall semester, 1946. These subjects represented 42 percent of the male veterans and 24 percent of the male non-veterans who were attending the University of Michigan at that time. On the whole, the investigator found no substantial difference in the academic achievement of the two groups. The veterans were at least holding their own. The underclass veterans seemed to find their work more difficult than did the non-veterans.

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[1]Roland B. Thompson, "Comparing Academic Records of Veteran and Civilian Students," Journal of American Association of College Registrars, XXII (January, 1947), 176-79.

[2]Clark Tibbitts, "Veterans and Non-Veterans at University of Michigan," School and Society, LXV (May 10, 1947), 347-50.

The opposite appeared to be true of the more advanced students.

The scholastic achievement of veterans and of civilian students in a state teachers' college was compared by Welborn.[1] The two groups were quite similar except that the veterans were older and more of them were married. The mean A C E centile for veterans was 54 and for civilians 49. The veterans were found to be slightly superior in scholastic achievement as compared with the civilians. Pre-war and post-war achievements were compared for those veterans who had pre-war attendance. The average improvement of those veterans studied was slightly less than three-fifths of a letter grade. In 20 percent of the cases there was a decline rather than an improvement in scholastic achievement. The amount of improvement did not appear to be related to A C E scores, age, or marital status.

Epler[2] studied the scholastic achievement of veterans and non-veterans attending the Vanport Extension Center at the University of Oregon. His comparison showed that the grade-point averages of veterans was slightly below that of non-veterans for the first quarter of the

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[1]E. L. Welborn, "The Scholarship of Veterans Attending A Teachers' College," Journal Educational Research, L (June, 1946), 209-14.

[2]Stephen B. Epler, "Do Vets Make Better Grades Than Non Vets," School and Society, LXVI (October 4, 1947), 270.

college year, but the improvement of veterans the succeeding quarters was much more than that of non-veterans. The results of the study further indicated that married veterans with children made better grades than did single veterans.

At Oklahoma A and M College, Orr[1] investigated the grade-point averages of 5,275 veterans and 3,436 non-veteran students for the period 1945 to 1947. The results of this study indicated that married veterans earned better grades than did single veterans, and male veterans were slightly superior to male non-veterans.

The results of Riemer's[2] research conducted at the University of Wisconsin appears to agree with Orr's findings. Data from this study gave the following grade-point averages: 1.66 for 4,201 veterans; 1.57 for 1,114 non-veterans; 1.80 for 1,021 married veterans, and 1.62 for 3,180 single veterans. For sixty-three married veterans with children living in trailer camps the grade-point average was 1.90, and for eighty-four married veterans living in trailer camps having no children the average was 1.73.

In order to determine the relationship between scholarship and such factors as age and marital status,

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[1]A. M. Orr, "Grade Point Averages of Veterans at Oklahoma A and M College," School and Society, LXVI (August 2, 1947), 94.

[2]Svend Riemer, "Married Veterans Are Good Students," Marriage Family Living, IX (June, 1947), 11-12.

it would appear necessary also to study these factors in a non-veteran population. This approach to the problem was made by Schaffer,[1] at the University of Indiana. He computed the credit-point ratios of 10,958 veterans and 4,962 non-veterans for the year 1946-1947, with the year of birth held constant. Thus credit-point ratios were compared for like age-groups. The non-veterans were found to exceed the veterans of the same age in every case. The data seem to imply that older students make better grades than younger students as a group and that there is very little difference between the veteran and non-veteran as such.

A study of the adjustment of disabled veterans to college training was conducted by a special commission of the American Council on Education under the direction of Williams and Strom.[2] The principal results of this study are as follows:

1. One out of every six disabled veterans discovered that his disability disqualified him for a desirable vocation.

2. A large number of disabled veterans had to change their pre-war occupational objectives.

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[1]Robert H. Schaffer, "Note on the Alleged Scholastic Superiority of Veterans," School and Society, LXVII (March 13, 1948), 205.

[2]E. G. Williamson and R. J. Strom, "The Disabled Veteran in College," School and Society, LXVII (May 1, 1948), 399.

3. Thirty percent of the married disabled veterans claimed that children and other distracting conditions at home affected their grades adversely.

In a study conducted at the University of Georgia by Osborne and Greene,[1] disabled veterans were compared with non-disabled veterans. Included in the investigation were 339 disabled veterans and 1,200 non-disabled veterans. These investigators reached the following conclusions:

1. The disabled veteran was 2.5 years older than the non-disabled veteran and had .4 of year more formal education.

2. The non-disabled veteran had longer military service.

3. A higher percentage of disabled veterans were married.

4. The disabled veteran had a slightly higher performance on the A C E and Ohio State Psychological Examinations.

5. In six of nine comparisons on the Kuder Interest Inventory, non-disabled veterans had a higher mean percentile rank than did disabled veterans.

6. Non-disabled veterans were more likely to prefer artistic, musical, and clerical activities, while

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[1] R. M. Osborne and J. E. Greene, "Are Disabled Veterans Different From Non-Disabled Veterans," School and Society, LIX (July 1, 1944), 8-11.

disabled veterans had much higher scores for social service activities.

7. A greater number of disabled veterans were pursuing professional courses of study.

8. The disabled veterans earned slightly higher grades.

Based upon the findings of these research studies, it would appear that veterans as college students are at least holding their own when compared with the younger non-veteran students. In many instances it was found that the veterans earned as good or better grades than the non-veterans even though the non-veteran student had a superior high school academic background. One may note that married veterans with children earned as high or higher grades than did single veterans.

The influence of the age factor on college scholarship seems to be somewhat controversial. Some investigators maintain that older students make better grades in college, and whether or not they are veterans is unimportant. Other writers attribute the veteran's superior scholarship to the fact he is more highly motivated, works harder and profits from his military experiences. The research studies further indicated that disabled veterans compared very favorably with non-disabled veterans in college scholarship. It would not appear that

the veteran's disability affected his scholastic grades adversely.

PREDICTION OF GENERAL SCHOLARSHIP

Performance on Psychological Tests

Segel[1] showed a median correlation of .48 between scholastic aptitude and college scholarship. In the investigations carried on by Durflinger[2] a median of .52 was established between I.Q. test scores and scholastic grades. Harston and Sprow[3] on correlating a number of psychological test scores with first semester grades noted that the psychological test scores predicted freshman grades better than they predicted total college scholarship. The Ohio State Psychological Examination showed, for example, a correlation coefficient of .50 with marks for one semester and .44 for seven semesters. This study indicated that while 80 percent of the freshmen who had I.Q.'s above 126 became seniors, 64 percent of those with an I.Q. below 116 became seniors also.

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[1]David Segel, "Prediction of Success In College," U. S. Office of Education Bulletin, 1934, No. 15. Washington: Government Printing Office, 1934. P. 60.

[2]Glenn W. Durflinger, "The Prediction of College Success - A Summary of Recent Findings," Journal of American Association of College Registrars, XIX, (October, 1943), 68-78.

[3]L. D. Harston and A. I. Sprow, "The Value of Intelligence Quotient Obtained in Secondary Schools for Predicting College Scholarship," Education and Psychology Measurement, I, (October, 1941), 387-398.

At Oklahoma A and M College, Rigg[1] studied the relation of college achievement tests to grades and to intelligence. He found that the correlations between scholastic aptitude and first semester scholarship were higher than the correlations between scholastic aptitude and college grades over a four-year period. The results of this study further indicated a low correlation between college scholastic grades and achievement test scores.

Borow[2] maintains that the median correlation of .45 derived from studies which used the intelligence test as a sole predictor indicates that the accuracy with which the college performance of a new student may be forecast by such a test is only about 11 percent better than sheer guesswork.

Traxler,[3] after studying the scores of more than 68,000 students in 323 colleges on the A C E, found that colleges differ strikingly in selectivity and in the intelligence quotient required for admission.

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[1]M. C. Rigg, "Relation of College Achievement Tests to Grades and to Intelligence," Journal of Educational Psychology, XXX (May, 1939), 397-400.

[2]Henry Borow, "Current Problems in the Prediction of College Performance," Journal American Association College Registrars, XXII (April, 1947), 387-96.

[3]Arthur Traxler, "What Is A Satisfactory I.Q. for Admission to College?," School and Society, LI (April 6, 1940), 462-64.

Borow[1] suggests that the limited predictive value of typical educational aptitude tests and entrance examinations resides partly in their failure to appraise the non-intellectual determinants of academic performance. He maintains that some students tend to exceed academic expectation, as based on aptitude test scores, whereas others fail to live up to scholastic promise. This tendency, he asserts, is associated in part with certain fairly characteristic differences in the scholastic attitudes and practices of these two groups.

Segel,[2] grouping the results of many studies, reported a median correlation coefficient of .545 between General Achievement Tests and college scholarship. Durflinger's studies[3] showed a median of .475 between scores obtained on General Achievement tests and scholastic achievement.

Edds and McCall[4] employed a combination of high school grades, Otis I.Q.'s, and Cross English Test scores and obtained a multiple correlation of .81 with general

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[1]Henry Borow, "The Measurement of Academic Adjustment," Journal American Association College Registrars, XXII (April, 1947), 387-96.

[2]Segel, op. cit., p. 65.

[3]Durflinger, op. cit., p. 68-78.

[4]J. H. Edds and W. M. McCall, "Predicting the Scholastic Success of College Freshmen," Journal of Educational Research, XXVII (October, 1933), 127-30.

scholarship. Douglas[1] concluded from his University of Minnesota studies that the multiple coefficients of correlation between success and a combination of predictive variables were higher and much more stable from year to year than were zero order coefficients of correlations between single predictive variables and measures of scholastic success.

The findings of the research studies reviewed above appear to agree fairly well with respect to the utilization of psychological test scores in predicting college scholastic achievement. The results of these studies would seem to indicate that educational aptitude tests have extremely limited predictive value and that other variables should be considered in evaluating an individual's chances for scholastic success in college training.

High School Grades and Grade-Point Averages

Many investigators report that high school grades and grade-point averages provide a more accurate basis for the prediction of college scholarship than do scholastic aptitude tests. Ashmore[2] studied the records of

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[1]H. R. Douglas, "Different Levels and Patterns of Ability Necessary for Success in College," Occupations, XXII (December, 1943), 182-86.

[2]Ben Ashmore, "High School Teachers' Marks as Indicators of College Success," Journal of American Association of College Registrars, XXI (January, 1946), 219-30.

all graduates of the Model High School, Eastern Kentucky State Teachers College, from 1931 to 1940, inclusive. He found that the coefficient of correlation of high school averages with first year college averages was higher than that between the former and those of either the first or second semesters. Moreover, the coefficient of correlation of high school averages with first year college averages was higher than the coefficient obtained by correlating first semester college averages with second semester averages. This would indicate that the high school scholastic record predicts freshman college achievement better than the first semester of the freshman year predicts the second. Ashmore[1] further found that two factors, intelligence and achievement in high-school English, predicted first-year college scholarship as well as these two factors combined with marks in any other single subject. The correlation coefficient obtained for intelligence and English with first year averages was .85 while the combined high school averages for mathematics, science, social science, and English produced a correlation of .88 with first-year college averages. This would seem to indicate that first-year college scholarship may be predicted about as well by intelligence and English as these two factors in combination with the grade point averages of the other three subjects.

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[1] Ibid.

Segel's[1] studies of correlation between college scholarship and average high school grades gave a median coefficient of .55 which was .11 higher than the median coefficient between intelligence test scores and college scholastic achievement. Smith,[2] using previous records to estimate college success, found correlations between predicted grade-point averages and grade-points actually earned for the third, fourth, and fifth semesters to be .63, .71 and .70 respectively. He noted that there was a tendency for any record to lose prognostic value after a year or two. Smith's findings differed from Ashmore's[3] results in that Smith found that the best single predictor of scholastic success in any given semester was the previous semester's scholastic record. Borow[4] points to the unreliability of class marks as the most important single deterrent to improving the prediction of college scholarship. He insists that the high school graduating

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[1]David Segel, "Prediction of Success In College," U. S. Office of Education Bulletin, 1934, No. 15. Washington: Government Printing Office, 1934. P. 88.

[2]F. F. Smith, "The Use of Previous Records in Estimating College Success," Journal Educational Psychology, XXXVI (March, 1945), 167-76.

[3]Ben Ashmore, "High School Teachers' Marks As Indicators of College Success," Journal of American Association of College Registrars, XXI (January, 1946), 219-30.

[4]Henry Borow, "The Measurement of Academic Adjustment," Journal American Association College Registrars, XXII (April, 1947), 387-96.

rank predicts, on the average, with a degree of accuracy which is only 16 percent greater than chance.

Douglas[1] has published several summaries regarding the relationship between patterns of high school subjects and college achievement. These studies which were conducted at the University of Minnesota indicated that the relationship was negligible. Douglas found that there was no predictive variable which was of much value in predicting success in all schools and colleges of the University of Minnesota. The variables found especially useful in predicting success in one school or college were not found equally prognostic for any other school or college.

Kronenberg[2] studied two groups of students in the General College of the University of Minnesota. The one group consisted of students who were deficient in meeting admission requirements because they had not taken special subjects in high school. This group was matched with students of equal ability who had met the requirements. He found that there was no significant difference between the college grades of the two groups.

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[1]H. R. Douglas, "Different Levels and Patterns of Ability Necessary for Success in College," Occupations, XXII (December, 1943), 182-86.

[2]Henry Kronenberg, "Validity of College Entrance Requirements," University of Minnesota Commission on Educational Research, 1937, p. 83.

Aikin[1] indicates that the special high school subject matter patterns required by a large number of colleges and universities as prerequisite to admission are not necessarily essential for the academic success of college students. The study included 1,475 pairs of students. The control group followed conventional subject matter programs, whereas the experimental group pursued programs based on student needs. Follow-up studies of these students in colleges and universities revealed that the experimental students, among other things, earned a slightly higher total grade-point average and a higher percent of non-academic honors than did the control group.

Based upon the findings of the research studies reviewed above, it would appear that the value of high school scholastic grade averages as a predictor of college scholarship of civilian students is definitely questionable.

Chronological Ages of Entering Students

The factor of chronological age frequently has been considered an important variable in predicting college success. Many educators felt that veterans would encounter difficulty in college because of the fact that they were considerably older than the average non-veteran student and had been away from a formal educational situation for

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[1]W. M. Aikin, Story of the Eight Year Study. Boston: Harper Brothers, 1942, p. 111.

a number of years. The studies conducted by Clark,[1] Thompson,[2] Riemer[3] and Schaffer,[4] previously referred to, present findings which appear to challenge this point of view.

Dwyer[5] studied the achievement of civilian students at the University of Michigan. He found a negative relationship between age of admission and scholarship up to twenty-one years, and a positive trend beyond twenty-one. Thus with twenty-one as the point of reference, both the older and the younger were more likely to succeed. Dwyer's results seem to be in agreement with those of Schaffer,[6] who found that older students made better grades than younger students.

DIFFERENTIAL PREDICTION OF SCHOLARSHIP

A number of research studies have been conducted with reference to the prediction of college scholarship

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[1]Edward L. Clark, "Veterans As College Freshmen," School and Society, LXVII (September 13, 1947), 205-07.

[2]Roland B. Thompson, "Comparing Academic Records of Veteran and Civilian Students," Journal of American Association of College Registrars, XXII (January, 1947), 176-79.

[3]Svend Riemer, "Married Veterans Are Good Students," Marriage Family Living, IX (June, 1947), 11-12.

[4]Robert H. Schaffer, "Note on the Alleged Scholastic Superiority of Veterans," School and Society, LXVII (March 13, 1948), 205.

[5]Paul Dwyer, "Correlation Between Age at Entrance and Success in College," Journal of Educational Psychology, XXX (April, 1939), 251-63.

[6]Schaffer, op. cit., p. 205.

in particular fields of specialization. Crawford,[1] working with the records of Yale University students, attempted to differentiate between success in academic studies, or the liberal arts, and those of a scientific or technical nature. Success in the former he regarded as indicating verbal ability, while success in the latter indicated quantitative ability. Furthermore, he designated success in English, history and foreign language as the criterion of verbal ability and success in mathematics, chemistry, physics, biology, and mechanical drawing as the criterion of quantitative ability. His predictive measures of verbal ability included (a) high school marks, (b) verbal sections of the College Entrance Examination Board Scholastic Aptitude Tests, and (c) the C E E B test for quantitative subjects. He obtained a multiple correlation between actual and predicted differences in performance of .53. His results showed that (a) 60 to 70 percent of his predictors were positive, (b) about 25 percent were indeterminate, and (c) 4 to 8 percent were negative or erroneous.

Crawford's findings were verified by Wolf[2] who was able to forecast correctly the direction of differences in

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[1] A. B. Crawford, "Individual Differences in Educational Guidance," Psychological Monographs, XLVII (No. 2, 1936), 148-72.

[2] R. R. Wolf, "Differential Forecasts of Achievement and Their Use in Educational Counseling," Psychological Monographs, LI (No. 1, 1939), 1-53.

the performance of students at Yale University in approximately 70 percent of the cases, whereas 20 percent fell into an indeterminate category and 10 percent contradicted the forecast.

SUMMARY

In summarizing the studies of prediction of success of veterans as college students, it would appear that there are no significant differences among disabled veterans, non-disabled veterans and non-veterans. The results of these studies would seem to indicate that in predicting an individual's chances for academic success in an institution of higher learning several factors should be given careful consideration. Apparently no one variable has been found to have predictive significance sufficient to warrant reliance upon it alone as a means for estimating probable academic success. It would seem, therefore, that if individual prognoses are to approach accuracy, they must be based upon a consideration of combined data concerning the counselee furnished by several indexes which have been found to possess prognostic value.

An examination of the literature fails to reveal any investigations which are solely devoted to the problem of predicting the college achievement of disabled veterans. In the pages which follow, the writer reports his investigation of that problem.

CHAPTER III

AN ANALYSIS OF DATA PERTAINING TO SUBJECTS' BACKGROUND

The purpose of this chapter is to analyze the pertinent data utilized in the current investigation and to present the characteristics of the group studied.

SELECTION OF THE SUBJECTS

The 456 subjects of the present study were selected from the group of disabled veterans of World War II who were being trained within the state of Michigan under the provisions of Public Law 16 from 1944 to 1946. Those disabled veterans who were enrolled in a job training facility or an educational institution other than an institution of higher learning were not considered to be within the scope of this study and were therefore excluded. The results of a preliminary investigation indicated that there were approximately eight hundred disabled veterans enrolled in institutions of higher learning in the state of Michigan under the provisions of Public Law 16 during the above-mentioned period. The elimination of those for whom important data were not available, however, reduced the total number to 456.

Prior to enrolling in a college or university each of the subjects was counseled in a Veterans Administration Guidance Center. Some of these Guidance Centers were operated in conjunction with educational institutions wherein college or university personnel did the counseling, while others functioned as independent agencies wherein Veterans Administration personnel carried out the counseling. In as much as counseling was mandatory for all disabled veterans who applied for a course of education or training under Public Law 16, the basis upon which a subject entered college was determined in such an interview. It was the purpose of these counseling conferences or interviews to help the client to select a vocational objective and a course of education or training which would satisfy the following criteria:

1. The vocation must be one in which the work activities would not aggravate the veteran's disability.

2. It must offer fairly good possibilities for the veteran to become employable.

3. It must be within an occupational field for which the veteran possessed aptitudes, abilities and interests necessary for satisfactory preparation and successful performance.

It was the counselor's responsibility to utilize all available sources of data in an effort to assist the disabled veteran in the selection of a vocational objective

which would utilize to the maximum degree the veteran's unimpaired abilities, his aptitudes, interests, and personality traits without aggravating his disability. The counseling, therefore, involved an analysis and evaluation of psychological test results, scholastic grades and grade-point averages, the high school subjects liked best, employment experience, service experience with occupational significance, and any limiting factors caused by the veteran's disability.

SOURCES OF DATA

Data for the investigation were secured from a number of sources, but primarily from the following:

1. Application blank (V.A. Form 1900)
2. Veteran's Medical Case File
3. Army and Navy personnel form (WDAGO No. 20)
4. Counselor's records (V.A. Form 1902 Series)
5. Training progress reports (V.A. Form 1905D)
6. Transcripts of credits.

Of course, the primary criterion for the selection of a particular item of information was its degree of usefulness in investigating the basic issues of this study.

DATA COLLECTED

The information gathered from the foregoing sources was classified under four major headings:

I. Pre-service data

A. Age

B. Sex

C. High school scholastic grade-point average

D. High school subjects liked best

E. Employment experience

II. Service data

A. Number of months in service

B. Service experience having occupational significance

C. Service connected disability

D. Percent of disability

E. Rank at the time of discharge

III. Counseling data

A. Educational level

B. Marital status

C. Number of dependents

D. Results of A C E Psychological Examination

E. Results of Cooperative Natural Science Achievement Test

F. Results of Cooperative Social Science Achievement Test

G. Results of Cooperative Mathematics Achievement Test

H. Results of Kuder Interest Inventory

I. Vocational objective

IV. College or university data

A. Grades in specific subjects

B. Grade-point averages

FREQUENCY DISTRIBUTION OF THE SUBJECTS WITH RESPECT TO CERTAIN CHARACTERISTICS

The various categories of service-related disabilities of the veterans with whom we are dealing are shown in Table I. It may be noted that there are eight disability categories. Muscles, tendon, and joint disabilities is the largest group, comprising 136 cases, or 29.8 percent, of the total number of subjects. Neuropsychiatric disabilities were found in 94 cases or 20.6 percent. The category with the fewest number of cases is eye, ear, nose and throat conditions which comprises only 28 subjects, or 6.2 percent, of the total array. Table I further indicates that with respect to the severity of the veterans' disabilities, 33.5 percent of the group were disabled to the extent of 10 percent, whereas only 2.1 percent were 100 percent disabled.

The ages of the 456 veterans are given in Table II. It is apparent that twenty-two is the minimum age and only fifteen, or 3.3 percent, were thirty-four years of age or older whereas 198, or 43.2 percent, were found in the age group of twenty-five to twenty-seven years of age.

The dependency status of the subjects is given in Table III. In this table it is found that 234 veterans, comprising 51.1 percent of the total group, were single while 150 or 32.7 percent were married but with no children.

TABLE I

FREQUENCY OF OCCURRENCE OF CERTAIN PERCENTAGES OF DISABILITY BY CATEGORIES, FOUND AMONG VETERANS INCLUDED IN THIS STUDY

Categories	Percent of Disability											Total	
	10	20	30	40	50	60	70	80	90	100	Data Not Available	No.	Pct.
Muscles, tendons and joints	42	29	27	15	6	7	5	2	1	0	2	136	29.8
Amputations, bones, cartilages	13	8	5	1	7	4	2	0	2	2	0	44	9.6
Neuropsychiatric conditions	18	4	29	8	22	3	5	2	0	0	3	94	20.6
Skin and appendages	21	2	3	0	2	1	1	1	0	1	0	32	7.0
Eye, ear, nose and throat	11	3	1	0	5	4	0	0	0	0	4	28	6.2
Respiratory and circulatory	16	3	16	2	0	5	1	1	0	2	1	47	10.3
Communicable diseases	13	0	1	0	0	1	0	0	0	4	12	31	6.8
Miscellaneous	20	4	8	1	3	2	2	0	0	1	3	44	9.7
Total	154	53	90	27	45	27	16	6	3	10	25	456	100.0
Percent	33.7	11.8	19.9	5.8	9.8	5.8	3.6	1.3	.6	2.1	5.6	100.0	

TABLE II

AGES OF VETERANS WITH VARIOUS TYPES OF SERVICE-RELATED DISABILITIES

Categories	Ages					
	22-24	25-27	28-30	31-33	34 and Over	Data Not Available
Muscles, tendons and joints	40	65	20	9	2	0
Amputations, bones, cartilages	18	21	3	1	1	0
Neuropsychiatric conditions	24	45	14	4	7	0
Skin and appendages	6	16	9	1	0	0
Eye, ear, nose and throat	7	8	8	3	1	1
Respiratory and circulatory	14	23	8	0	0	2
Communicable diseases	4	12	7	6	2	0
Miscellaneous	17	18	5	2	2	0
Total	130	208	74	26	15	3
Percent	28.6	45.8	16.4	5.6	3.1	.5

TABLE III

DEPENDENCY STATUS OF VETERANS WITH VARIOUS TYPES OF SERVICE-RELATED DISABILITIES

Categories	Dependency Status 0 Single	1 Married No Child	2 Married One Child	3 Married 2 Children	4 Married 3 Children	5 Married 4+ Children
Muscles, tendons, joints	74	41	18	1	2	0
Amputations, bones, cartilages	23	14	7	0	0	0
Neuropsychiatric conditions	39	35	15	2	0	3
Skin and appendages	13	14	5	0	0	0
Eye, ear, nose and throat	15	10	0	1	1	1
Respiratory and circulatory	27	13	3	3	1	0
Communicable diseases	17	9	4	0	0	1
Miscellaneous	26	14	3	1	0	0
Total	234	150	55	8	4	5
Percent	51.2	32.8	12.2	1.8	.9	1.1

Of the 222 married veterans, seventy-two had children, but only seventeen had more than one child. Of the total group there were five subjects who had four or more children.

With reference to the length of the veterans' military service, it may be seen in Table IV that none of the subjects had less than five months of service and only fourteen, or 3.1 percent, served for fifty months or longer. The largest number of veterans, one hundred or 22 percent, had from thirty to thirty-four months of service.

The high school grade-point averages are indicated in Table V. It may be noted that data pertaining to high school scholarship were not available in eighty-six cases which comprise 18.9 percent of the 456 subjects. The grade-point averages listed in Table V were computed by allowing 4 points for an A, 3 points for a B, 2 points for a C, 1 point for a D, and 0 points for an E. There were eighteen subjects who earned high school grade-point averages ranging from 1.0 to 1.4. In forty-eight cases, or 10.5 percent of the total, the grade-point averages ranged from 3.5 to the maximum 4.0. It is apparent that the largest numbers of veterans, 103 and 97 respectively, earned grade-point averages ranging from 2.0 to 2.4 and from 2.5 to 2.9. These two groups combined represent two hundred veterans, or more than 50 percent of the total number for whom information concerning high school scholarship was available.

TABLE IV

LENGTH OF SERVICE OF VETERANS WITH VARIOUS TYPES OF SERVICE-RELATED DISABILITIES

Categories	Months in Service										
	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+	Data Not Available
Muscles, tendons, joints	5	7	8	14	28	38	18	10	4	3	1
Amputations, bones, cartilages	2	2	6	4	7	8	7	2	0	3	3
Neuropsychiatric conditions	5	8	13	10	18	19	9	2	4	2	4
Skin and appendages	1	2	0	1	5	5	11	1	4	2	0
Eye, ear, nose, and throat	2	3	4	1	2	3	5	4	2	1	1
Respiratory and circulatory	7	10	3	7	4	10	5	1	0	0	0
Communicable diseases	0	1	0	2	6	3	8	1	5	5	0
Miscellaneous	1	7	2	5	9	9	7	1	1	0	2
Total	23	40	36	44	79	95	70	22	20	16	11
Percent	5.1	8.6	7.9	10.0	17.8	21.2	14.9	4.6	4.4	3.1	2.4

TABLE V

HIGH SCHOOL GRADE-POINT AVERAGES EARNED BY VETERANS WITH VARIOUS SERVICE-RELATED DISABILITIES

Categories	Averages						
	1.0-1.4	1.5-1.9	2.0-2.4	2.5-2.9	3.0-3.4	3.5-4.0	Data Not Available
Muscles, tendons, joints	2	9	34	38	28	22	3
Amputations, bones, cartilages	3	1	8	7	6	5	14
Neuropsychiatric conditions	3	8	27	18	14	5	19
Skin and appendages	2	1	6	3	6	4	10
Eye, ear, nose and throat	4	2	2	7	5	3	5
Respiratory and circulatory	3	1	10	11	6	4	12
Communicable diseases	0	2	6	6	7	1	9
Miscellaneous	1	1	10	7	7	4	14
Total	18	25	103	97	79	48	86
Percent	3.9	5.5	22.6	21.3	17.3	10.5	18.9

With respect to college scholarship the grade-point averages earned by these veterans are given in Table VI. As was found in regard to the high school scholastic averages, the vast majority of the veterans earned college grade-point averages ranging from 2.0 to 2.9. A total of 218 subjects had college grade-point averages ranging from 2.0 to 2.4, which comprised 47.8 percent of the entire group, while 135 cases, or 29.6 percent, of the total, earned scholastic averages ranging from 2.5 to 2.9. There were only thirty-six cases whose scholarship fell below 2.0, and sixty-seven cases where the grade-point averages were 3.0 or higher.

The percentile distribution of the 456 veterans on the A C E Psychological Examination is given in Table VII. In analyzing this table it is apparent that the largest percent of the cases falls in the group ranging from 91 to 100. Of the 456 individuals, 119, or 25.9 percent, earned a percentile rank ranging from 91 to 100. Only eleven veterans, or 2.2 percent, fell below the 30th percentile. These percentile ranks are based on entering college freshmen's norms published in 1944 and 1945 by the American Council on Education.

With reference to the subjects' performance on achievement tests, the percentile distribution of the veterans on the Cooperative Achievement tests in mathematics, natural science, and social science is given in

TABLE VI

COLLEGE GRADE-POINT AVERAGES EARNED BY VETERANS WITH VARIOUS SERVICE-RELATED DISABILITIES

Categories	Averages						
	1.0-1.4	1.5-1.9	2.0-2.4	2.5-2.9	3.0-3.4	3.5-4.0	Data Not Available
Muscles, tendons, joints	0	13	59	44	16	4	0
Amputations, bones and cartilages	0	2	24	11	5	2	0
Neuropsychiatric conditions	3	10	43	25	12	1	0
Skin and appendages	0	1	13	12	5	1	0
Eye, ear, nose and throat	1	1	12	10	3	1	0
Respiratory and circulatory	0	2	29	9	5	2	0
Communicable diseases	0	1	17	11	2	0	0
Miscellaneous	1	1	21	13	5	3	0
Total	5	31	218	135	53	14	0
Percent	1.1	6.8	47.8	29.6	11.6	3.1	0

TABLE VII

PERCENTILE DISTRIBUTION OF 456 DISABLED VETERANS ON A C E PSYCHOLOGICAL EXAMINATION

Categories	Percentile Ranks									
	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Data Not Available
Muscles, tendons, joints	2	1	9	11	15	18	29	15	36	0
Amputations, bones, cartilages	1	2	2	5	5	3	4	7	14	0
Neuropsychiatric conditions	0	3	7	9	13	14	6	23	19	0
Skin and appendages	0	0	2	1	0	2	5	7	14	1
Eye, ear, nose and throat	0	0	2	2	4	1	7	3	9	0
Respiratory and circulatory	1	0	4	5	5	2	9	9	11	1
Communicable diseases	0	0	1	4	5	5	7	4	5	0
Miscellaneous	0	1	4	4	2	6	8	8	11	0
Total	4	7	31	41	49	51	75	76	119	2
Percent	.8	1.4	6.9	9.5	10.9	11.5	16.9	15.8	25.9	.4

Tables VIII, IX, and X respectively. Table VIII shows the percentile distribution on the Cooperative Achievement Test in Mathematics. It may be noted that in 224 cases, or 49.1 percent of the entire group, data were not available concerning the veterans' on this particular test. There were only eleven veterans, or 4.9 percent of this array of 232, who scored below the twentieth percentile on this test. Ninety-three of the 232, or approximately 40 percent, earned scores on the Cooperative Achievement Test in Mathematics which gave them a percentile ranking from 80 to 100.

Of the 184 cases for whom scores were available on the Cooperative Achievement Test in Natural Science, approximately 51 percent were ranked above the 80th percentile (Table IX). The same trend is found in the percentile distribution on this test as was noted in connection with the Achievement Test in Mathematics. A large percent of the veterans performed very well while an extremely small number, in this instance only 5.9 percent of the 184 cases, were found at the lower end of the scale, that is, below the 20th percentile.

There were only 145 veterans to whom the Cooperative Achievement Test in Social Science was administered. A similar trend may be found in the percentile distribution on this test as was found in connection with the Achievement Tests in mathematics and natural science. It

TABLE VIII

PERCENTILE DISTRIBUTION OF 232 DISABLED VETERANS ON COOPERATIVE ACHIEVEMENT TEST IN MATHEMATICS

Categories	Percentile Ranks								
	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Muscles, tendons, joints	5	4	1	6	3	8	11	17	16
Amputations, bones, cartilages	0	3	0	1	3	5	3	6	9
Neuropsychiatric conditions	1	2	5	6	6	1	7	7	6
Skin and appendages	1	2	1	0	0	1	2	4	3
Eye, ear, nose and throat	1	2	0	1	4	0	4	1	2
Respiratory and circulatory	1	0	3	4	2	3	6	4	2
Communicable diseases	2	1	2	1	2	1	2	2	2
Miscellaneous	0	0	3	0	3	1	2	6	6
Total	11	14	15	19	23	20	37	47	46
Percent	4.9	6.1	6.6	8.3	9.9	8.4	15.9	20.0	19.9

TABLE IX

PERCENTILE DISTRIBUTION OF 184 DISABLED VETERANS ON COOPERATIVE ACHIEVEMENT TEST IN NATURAL SCIENCE

Categories	Percentile Ranks								
	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Muscles, tendons, joints	3	1	0	4	3	7	7	12	21
Amputations, bones, cartilages	1	1	1	1	3	0	2	9	2
Neuropsychiatric conditions	0	0	1	2	3	2	5	4	8
Skin and appendages	2	0	0	0	1	1	0	1	8
Eye, ear, nose and throat	1	0	0	0	1	3	1	3	3
Respiratory and circulatory	2	1	1	1	1	0	4	4	6
Communicable diseases	0	0	0	2	1	4	4	3	4
Miscellaneous	2	0	2	2	2	1	2	2	5
Total	11	3	5	12	15	18	25	38	57
Percent	5.9	1.6	2.8	6.4	8.0	10.3	14.0	20.4	30.6

TABLE X

PERCENTILE DISTRIBUTION OF 145 DISABLED VETERANS ON COOPERATIVE ACHIEVEMENT TEST IN SOCIAL SCIENCE

Categories	Percentile Ranks								
	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Muscles, tendons, joints	1	3	6	7	2	11	7	6	10
Amputations, bones, cartilages	0	0	1	1	0	2	3	2	3
Neuropsychiatric conditions	1	0	2	2	2	3	4	6	5
Skin and appendages	1	0	0	0	0	1	0	1	4
Eye, ear, nose and throat	1	0	0	2	0	1	1	0	2
Respiratory and circulatory	1	1	0	1	0	2	2	1	4
Communicable diseases	0	1	1	1	1	2	2	4	2
Miscellaneous	0	0	0	1	2	2	4	2	4
Total	5	5	10	15	7	24	23	22	34
Percent	3.3	3.3	6.7	10.2	4.6	16.8	16.2	15.6	23.4

may be seen in Table X that the largest percent of the cases appear at the top of the scale, whereas only five, or 3.3 percent, earned scores which placed them below the 20th percentile. Of the 145 subjects, there were 56, representing nearly 40 percent of this group, who earned scores which ranked them above the 80th percentile. The percentile rankings on the Achievement Tests mentioned above were based on entering college freshmen norms published in 1944 and 1945 by the Cooperative Test Service.

The educational levels of the veterans as of the time of the counseling interviews are given in Table XI. It may be noted that only 4.4 percent of the entire group had failed to complete high school prior to their entrance into an institution of higher learning under the provisions of Public Law 16. More than one-half, that is 57.5 percent, of the veterans were high school graduates and 35.2 percent had completed one or two years of college. Only five veterans, or 1.1 percent of the total, had completed more than two years of college at the time they resumed their education under the Rehabilitation Act.

The high school subjects the veterans liked best are shown in Table XII. It is interesting to note that 214 of the 348 subjects, or 61.5 percent, indicated that they liked mathematics and science the best of any of their high school subjects. Only twenty-three, comprising 6.6 percent of the 348 under consideration, preferred "the

TABLE XI

EDUCATIONAL LEVELS AT TIME OF COUNSELING
OF 456 DISABLED VETERANS

Categories	1-3 Years of H.S.	H.S. Graduates	1-2 Years College	3-4 Years College	Not Available
Muscles, tendons, joints	7	87	38	0	4
Amputations, bones, cartilages	2	22	19	1	0
Neuropsychiatric conditions	9	56	27	1	1
Skin and appendages	2	11	18	1	0
Eye, ear, nose and throat	0	17	10	1	0
Respiratory and circulatory	0	31	13	1	2
Communicable diseases	0	15	15	0	1
Miscellaneous	0	23	21	0	0
Total	20	262	161	5	8
Percent	4.4	57.5	35.2	1.1	1.8

TABLE XII

HIGH SCHOOL SUBJECTS LIKED BEST
BY 348 DISABLED VETERANS

Subjects	Number	Percent
English and language	48	13.8
Social studies	52	14.9
Mathematics and science	214	61.5
The arts	23	6.6
Not stated	11	3.2
Total	348	100.0

arts" which included industrial arts as well as art and music. Social studies was indicated as the second most popular high school subject by fifty-two veterans, or 14.9 percent of this array, while forty-eight, or 13.8 percent, liked English and languages best. No information was available concerning high school subjects liked best in 108 of the 456 cases.

Military rank at the time of discharge from the armed services of the foregoing 348 subjects is given in Table XIII. The ranks listed in this table are expressed in military terminology although they also include comparable naval ranks. The following weights were assigned these ranks: 1 equals private and seaman third class; 2 equals corporal and seaman second class; 3 equals sergeant, seaman first class and chief petty officer; 4 equals second lieutenant and ensign; 5 equals first lieutenant and lieutenant junior grade; 6 equals captain and lieutenant senior grade; 7 equals major and lieutenant commander; 8 equals lieutenant colonel and commander. It may be seen that 147 of the 346 veterans, comprising 42.4 percent, of this group, were discharged from the armed services as privates or seamen third class. Those veterans discharged as corporals and seamen second class numbered seventy-six and constituted 21.8 percent of the group. The sergeants, seamen first class, and chief petty officers comprised the second largest group. There were 102 in

TABLE XIII

MILITARY RANK OF 348 DISABLED VETERANS AT TIME OF DISCHARGE FROM THE ARMED SERVICES

Disabilities Categories	Private	Corporal	Sergeant	2nd Lt.	1st Lt.	Captain	Major	Lt. Colonel	Colonel	Not Stated
Muscles, tendons, joints	53	13	28	1	2	1	0	0	1	3
Amputations, bones, cartilages	19	5	6	1	1	1	0	0	0	0
Neuropsychiatric conditions	33	16	19	1	0	0	0	0	0	5
Skin and appendages	6	7	9	0	1	0	0	0	0	0
Eye, ear, nose and throat	10	4	7	0	0	0	0	0	0	0
Respiratory and circulatory	15	10	13	0	0	0	0	0	0	1
Communicable diseases	0	13	8	0	0	0	0	0	0	3
Miscellaneous	11	8	12	0	0	0	0	0	0	1
Total	147	76	102	3	4	2	0	0	1	13
Percent	42.3	21.8	29.3	1.0	1.1	.006	0	0	.002	3.7

this array, or 29.3 percent. Therefore, 325 of the 348 subjects for whom information was available relative to military rank at time of discharge, or 93.4 percent, were enlisted personnel. Only ten of the veterans comprising 2.9 percent of the group received officer commissions prior to their discharge from the military service.

Before entering a college or university under the provisions of the Rehabilitation Act, the disabled veteran with the assistance of a counselor selected a vocational objective for which he desired a course of training. These vocational objectives represent a number of major occupational fields. An analysis of the various occupations which were selected by these veterans is given in Table XIV. Fifteen major occupational classifications are listed which gives an indication of the range of vocational interests of the 456 disabled veterans. It may be seen that engineering is by far the most popular field. Approximately 30 percent were studying engineering. The second largest group, forty-six or 10.1 percent, were preparing for teaching positions in the secondary schools. When this number is combined with the seventeen who were interested in college teaching, a total of sixty-three emerges who studied in the field of education. Law appears to be the third largest field followed by agriculture and forestry and the physical and natural sciences. When one analyzes

TABLE XIV

OCCUPATIONAL CHOICES OF 456 DISABLED VETERANS

	Muscles, Tendons, Joints	Amputations, Bones, Cartilages	Neuro-psychiatric Conditions	Respiratory, Circulatory Conditions	Communicable, Infectious Diseases	Eye, Ear, Nose and Throat Conditions	Skin and Appendages	Miscel-laneous	Total
Accounting	5	3	4	5	2	0	0	4	23
Agriculture and Forestry	16	1	2	1	6	1	2	3	32
Architecture and Designing	4	2	3	0	0	0	0	1	10
Dentistry	2	2	1	2	1	1	1	0	10
Engineering	49	13	18	14	8	9	12	13	136
Junior Executive	5	4	8	1	0	3	2	3	26
Journalism and Public Relations	7	2	4	2	0	0	1	2	18
Law	9	4	7	2	4	3	4	7	40
Medicine	2	1	2	2	1	0	1	0	9
Personnel and Industrial Relations	2	2	5	1	4	0	1	0	15
Physical and Natural Science	11	2	4	4	1	2	2	4	30
Sales and Advertising	6	2	10	2	1	0	0	2	23
Social Science	5	1	8	1	1	3	0	2	21
Teachers College	6	1	3	3	0	2	1	1	17
Teachers High School	7	4	15	7	3	4	4	2	46
Totals	136	44	94	47	32	28	31	44	456

the occupational choices of the ninety-four veterans with neuropsychiatric disabilities, one finds that only eighteen or approximately 19 percent in this category selected engineering as a career, compared with 32.6 of the subjects in the seven other classes of disabilities. Thirty-eight neuropsychiatric subjects majored in the five social service areas, namely, teaching, law, social science, and personnel and industrial relations, as contrasted with 101 veterans with other disabilities who selected vocational objectives in these social service occupations.

SIGNIFICANT DIFFERENCES AMONG THE PERSONAL CHARACTERISTICS OF DISABLED VETERANS

To determine whether any statistically significant differences existed among the personal characteristics of the 456 veterans with whom this study deals the following procedure was employed.

The mean which was used as the measure of central tendency was computed for each distribution. Dispersion or variability within the distributions was indicated by the square root of the unbiased estimate of the variance. These were calculated according to the derived formulas:[1]

$$\sigma = \sqrt{\frac{N\Sigma X^2 - (\Sigma X)^2}{N(N-1)}} \qquad M = \frac{\Sigma X}{N}$$

[1]Henry E. Garrett, Statistics in Psychology and Education, (New York: Longmans, Green and Company, 1947), 63.

The significance of difference between means was tested by use of the Student-Fisher t. The utilization of the analysis of variance technique provided a means of testing the significance of the variability among groups. This technique involves a test of the null hypothesis which implies that there are no true differences among the groups. When the null hypothesis can be rejected at a high level of confidence, the differences are considered as statistically significant.[1,2]

It was found that statistically significant differences occurred between the means of the following variables: age, percent of disability, and number of months in the armed service. In regard to age and percent of disability, the differences were significant at the 5 percent level of confidence, whereas, in the case of the number of months served in the armed forces, the differences were significant at the 1 percent level.

Means and Standard Deviations

The means and standard deviations of certain variables among the 456 veterans appear in Table XV. This table may be interpreted to mean that the "average" veteran was slightly over twenty-six years of age and had .75 dependents. He had served between twenty-eight

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[1] Ibid., pp. 254-264.

[2] E. F. Lindquist, Statistical Analysis in Educational Research, (Boston: Houghton Mifflin Company, 1940), 56-66.

TABLE XV

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG 456 VETERANS WITH VARIOUS TYPES OF SERVICE-RELATED DISABILITIES

Variables	Means	Standard Deviations
Age	26.30*	2.99
Number of dependents	.75	1.12
Percent of disability	30.44*	22.22
Number of months in armed forces	28.55**	11.41
Military rank at time of discharge	1.96	1.06
High school scholastic achievement	2.63	6.64
College scholastic achievement	2.45	5.63
Percentile ranks:		
A C E Psychological Examination	72.15	20.85
Cooperative Natural Science Examination	74.11	23.73
Cooperative Social Science Examination	69.96	23.07
Cooperative Mathematics Examination	67.96	24.51

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

and twenty-nine months in the armed forces, was a corporal or seaman second class at the time of discharge and was disabled to the extent of approximately 30 percent. This "typical" veteran earned a high school grade-point average of 2.63. His college scholarship under the Rehabilitation Act was 2.45. This veteran's performance on the A C E Psychological Examination and the Cooperative Achievement Tests in Mathematics, Natural Science and Social Science placed him at the 72nd, 67th, 74th and 69th percentile ranks respectively.

It may be seen in Table XVI that among the 136 veterans with muscle, tendon, and joint disabilities the means of the variables compare very favorably with those of the entire group. The only significant difference is found in the percent of disability, where the mean percent for this group is 27.84 whereas for all subjects it is 30.44. This difference in means is significant at only the 5 percent level of confidence.

With reference to the forty-four veterans having amputations and bone and cartilage disabilities, Table XVII indicates a mean age of approximately one year less than the average age of the entire group. Moreover, these veterans had a mean percent of disability of 27.84 as compared with 30.44 for the total group. These differences are significant at the 5 percent level. The differences in the mean percentile ranks on psychological

TABLE XVI

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG 136 VETERANS WITH MUSCLE, TENDON, AND JOINT DISABILITIES

Variables	Means	Standard Deviations
Age	26.28*	3.14
Number of dependents	.65	.85
Percent of disability	27.84*	18.57
Number of months in armed forces	29.23**	9.71
Military rank at time of discharge	1.94	1.31
High school scholastic achievement	2.71	6.14
College scholastic achievement	2.47	4.49
Percentile ranks:		
A C E Psychological Examination	72.33	20.87
Cooperative Natural Science Examination	76.84	22.57
Cooperative Social Science Examination	65.45	23.42
Cooperative Mathematics Examination	70.59	24.65

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

TABLE XVII

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG FORTY-FOUR VETERANS WITH AMPUTATIONS AND BONE AND CARTILAGE DISABILITIES

Variables	Means	Standard Deviations
Age	25.32*	2.36
Number of dependents	.64	.75
Percent of disabilities	27.84*	18.57
Number of months in armed forces	29.00**	11.48
Military rank at time of discharge	1.88	1.29
High school scholastic achievement	2.64	7.69
College scholastic achievement	2.57	11.30
Percentile ranks:		
A C E Psychological Examination	71.86	24.26
Cooperative Natural Science Examination	71.10	23.83
Cooperative Social Science Examination	74.50	19.20
Cooperative Mathematics Examination	73.93	22.55

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

tests for this group are not significant at either the 5 percent or 1 percent level.

The veterans with neuropsychiatric disabilities appear to differ from the total group in two respects. It is indicated in Table XVIII that these veterans, as a group, devoted less time to active military service and were more severely disabled. These differences are significant at the 1 percent and 5 percent confidence levels respectively. The differences in the means of the other variables are not significant.

There were only thirty-two with skin disabilities (Table XIX). The only significant variations from the group means were found in percent of disability and length of military service. These individuals had a mean percent of disability of 23.44 compared with 30.44 for the entire group. Their average period of military service was 33.84 months while the mean for all 456 subjects was 28.55. This difference of approximately five is significant at the 1 percent level of confidence, whereas the difference between mean percents of disability is significant at the 5 percent level.

The smallest number of cases (twenty-eight) is found in the eye, ear, nose and throat category (Table XX). These veterans had a lower percent of disability (28.75) and a slightly longer period of military service (29.67 months) than the entire group. These differences in means

TABLE XVIII

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG NINETY-FOUR VETERANS WITH NEUROPSYCHIATRIC CONDITIONS

Variables	Means	Standard Deviations
Age	26.59*	3.19
Number of dependents	1.01	1.50
Percent of disability	35.60*	18.27
Number of months in armed forces	26.37**	11.16
Military rank at time of discharge	1.83	.89
High school scholastic achievement	2.49	6.00
College scholastic achievement	2.36	4.95
Percentile ranks:		
A C E Psychological Examination	70.47	20.69
Cooperative Natural Science Examination	76.12	19.06
Cooperative Social Science Examination	71.60	22.28
Cooperative Mathematics Examination	64.90	23.00

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

TABLE XVIII

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG NINETY-FOUR VETERANS WITH NEUROPSYCHIATRIC CONDITIONS

Variables	Means	Standard Deviations
Age	26.59*	3.19
Number of dependents	1.01	1.50
Percent of disability	35.60*	18.27
Number of months in armed forces	26.37**	11.16
Military rank at time of discharge	1.83	.89
High school scholastic achievement	2.49	6.00
College scholastic achievement	2.36	4.95
Percentile ranks:		
A C E Psychological Examination	70.47	20.69
Cooperative Natural Science Examination	76.12	19.06
Cooperative Social Science Examination	71.60	22.28
Cooperative Mathematics Examination	64.90	23.00

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

TABLE XIX

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG THIRTY-TWO VETERANS WITH SKIN AND APPENDAGE CONDITIONS

Variables	Means	Standard Deviations
Age	26.41*	2.17
Number of dependents	.75	.72
Percent of disability	23.44*	24.04
Number of months in armed forces	33.84**	11.19
Military rank at time of discharge	2.26	1.01
High school scholastic achievement	2.58	9.15
College scholastic achievement	2.53	4.45
Percentile ranks:		
A C E Psychological Examination	82.81	16.85
Cooperative Natural Science Examination	76.08	31.42
Cooperative Social Science Examination	79.14	29.68
Cooperative Mathematics Examination	67.93	29.67

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

TABLE XX

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG TWENTY-EIGHT VETERANS WITH EYE, EAR, NOSE AND THROAT DISABILITIES

Variables	Means	Standard Deviations
Age	26.81*	3.53
Number of dependents	.89	1.69
Percent of disability	28.75*	21.12
Number of months in armed forces	29.67**	14.17
Military rank at time of discharge	1.86	.91
High school scholastic achievement	2.56	8.08
College scholastic achievement	2.48	4.84
Percentile ranks:		
A C E Psychological Examination	73.79	19.26
Cooperative Natural Science Examination	75.75	23.11
Cooperative Social Science Examination	62.43	29.14
Cooperative Mathematics Examination	60.27	27.37

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

are significant at the 5 percent and 1 percent levels of confidence, respectively.

From an inspection of Table XXI it is apparent that among the forty-seven veterans who were discharged from the armed services with respiratory and circulatory conditions, the only significant variation from the group means is found in the length of military service. These individuals averaged 21.91 months in the armed services or approximately seven months less than the mean number of months for the entire array of 456 veterans. This difference is significant at the 1 percent level of confidence. The differences in age and percent of disability, it may be noted, are extremely small. The other variations in means were not found to be significant.

The means and standard deviations of certain variables among the thirty-one veterans who were discharged from the military service as a result of the effects of communicable diseases are given in Table XXII. Here it is shown that these veterans were slightly older, had served considerably longer in the armed forces, and had a higher percent of disability than did the total number of 456 subjects studied. The difference of nine months spent in military service is significant at the 1 percent level while the variations in age and percent of disability are significant only at the 5 percent level.

TABLE XXI

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG FORTY-SEVEN VETERANS WITH RESPIRATORY AND CIRCULATORY CONDITIONS

Variables	Means	Standard Deviations
Age	25.60*	2.04
Number of dependents	.68	1.00
Percent of disability	31.09*	23.69
Number of months in armed forces	21.91**	10.67
Military rank at time of discharge	1.95	.87
High school scholastic achievement	2.59	7.01
College scholastic achievement	2.39	4.35
Percentile ranks:		
A C E Psychological Examination	71.63	21.81
Cooperative Natural Science Examination	70.10	28.76
Cooperative Social Science Examination	70.58	28.53
Cooperative Mathematics Examination	63.48	23.02

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

TABLE XXII

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG THIRTY-ONE VETERANS WITH COMMUNICABLE DISEASES

Variables	Means	Standard Deviations
Age	27.84*	3.02
Number of dependents	.81	1.51
Percent of disability	32.63*	37.69
Number of months in armed forces	37.81**	12.14
Military rank at time of discharge	2.38	.50
High school scholastic achievement	2.70	5.52
College scholastic achievement	2.38	3.28
Percentile ranks:		
A C E Psychological Examination	69.32	18.21
Cooperative Natural Science Examination	76.89	16.83
Cooperative Social Science Examination	71.00	21.59
Cooperative Mathematics Examination	56.67	27.99

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

The veterans discharged from the service with miscellaneous disabilities (Table XXIII) had a smaller percent of disability and a shorter period of time in the armed services than did the entire group of veterans studied. The difference in age is very slight and the other variations are not significant at either the 1 percent or 5 percent level of confidence.

After carefully analyzing the means and standard deviations of each of the predictive variables and testing the significance of the variability among the eight disability groups, the advantages of combining certain groups for further statistical study was studied. As previously indicated, the only variable which showed significant differences at the 1 percent confidence level in all the categories of disability was the length of military service. It seemed, therefore, that various combinations could be made without seriously affecting the true differences among the groups. To combine certain categories would increase the size of the groups, and thereby increase the reliability of the coefficients of correlation between college scholastic achievement and certain predictive variables. The following combinations of disability groups were therefore made:

1. The 136 cases with muscle, tendon and joint disabilities (Table XVI) were combined with the forty-four

TABLE XXIII

MEANS AND STANDARD DEVIATIONS OF CERTAIN VARIABLES AMONG FORTY-FOUR VETERANS WITH MISCELLANEOUS DISABILITIES

Variables	Means	Standard Deviations
Age	26.00*	3.25
Number of dependents	.52	.73
Percent of disability	26.10*	21.78
Number of months in armed forces	26.45**	9.50
Military rank at time of discharge	2.03	.88
High school scholastic achievement	2.68	6.22
College scholastic achievement	2.50	5.46
Percentile ranks:		
A C E Psychological Examination	72.57	21.07
Cooperative Natural Science Examination	65.06	28.20
Cooperative Social Science Examination	77.27	15.85
Cooperative Mathematics Examination	75.43	20.40

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

subjects with amputations, and bone and cartilage disability category (Table XVII) or a total of 180.

2. The thirty-one veterans in the communicable disease category (Table XXII) were combined with the thirty-two subjects with skin and appendage disabilities (Table XIX). This combination resulted in a total of sixty-three cases.

3. The third combination included the twenty-eight cases with eye, ear, nose and throat disabilities (Table XX) and the forty-seven with respiratory and circulatory conditions (Table XXI). This new group consisted of seventy-five cases.

4. The ninety-four neuropsychiatric cases remained intact as did the miscellaneous category with forty-four cases.

Hereafter, the foregoing combinations will be employed in studying the relation of certain predictive variables to the levels of college scholarship that the veterans included in this study attained.

This chapter has presented an analysis of certain background data. Chapter IV will take up the prognostic phases of the study.

CHAPTER IV

EXTENT TO WHICH CERTAIN FACTORS ARE ASSOCIATED WITH THE GENERAL SCHOLASTIC SUCCESS OF DISABLED VETERANS

An important step in the counseling of disabled veterans after all relevant facts have been collected, recorded and analyzed is that of considering the appropriateness of several tentative educational or vocational objectives. It is the responsibility of the counselor to assist the disabled veteran to understand, weigh and interpret the various factors that need to be considered in determining the suitability of each of these objectives. This requires on the part of both the counselor and the veteran information concerning the requirements of the goals as well as knowledge of the abilities, interests and aptitudes of the veteran. At this point in the counseling process, from all of the information available, both the counselor and the veteran attempt to predict the veteran's probable success in achieving each of the objectives under consideration.

It should be recognized that in attempting to determine the suitability of an educational or vocational

objective and consequently to predict the chances for success in realizing it, it is necessary to consider first the nature of the educational program leading to that objective, the requirements for successful completion of the educational or training program and the extent to which the individual meets these requirements. For the majority of objectives, two predictions or prognoses are necessary; first, the prediction of success in the education or training program leading to the vocational objective, and second, the prediction of success in the later performance of the job itself. The disabled veteran is therefore faced with two "hurdles," and although the requirements for training and for the job itself are often quite similar, that is not always the case. It is essential to ascertain whether the veteran possesses the traits necessary to enable him to clear at least the first "hurdle," namely, the educational or training program. The prediction of the veteran's chances of making a successful adjustment to the job itself, which constitutes the second major "hurdle," does not come within the scope of this investigation. The current study is designed to investigate only the first of the major "hurdles," namely, the prediction of success in a college or university training program.

A basic principle regarding the prediction of college success is that prediction should be based upon

knowledge of several factors rather than upon only one. In estimating an individual's chances in a college or university program it is self-evident that the counselor should have as much relevant information as possible. It is therefore the purpose of this chapter to present and interpret the data bearing upon the determination of factors associated with the college success of the 456 disabled veterans comprising this study.

CRITERIA OF SUCCESS

As we have seen in previous pages, some authors have argued that grades are an unsatisfactory criterion of achievement and have sought to use various other criteria in the evaluation of college success. For instance, in the Eight Year Study a number of factors, in addition to grades and grade-point averages, were considered as indicative of college success.[1] There, intellectual curiosity, objective thinking, resourcefulness in meeting new situations, ability to plan one's time effectively, appreciation of the arts, participating in student activities, non-academic honors, orientation toward the choice of a vocation and an active concern for what was going on in the world were all considered in determining what constituted the successful college student.

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[1] W. M. Aikin, Story of the Eight Year Study. Boston: Harper Brothers, 1942, p. 141.

Certainly there are many non-academic determinants of scholastic performance. Such factors as motivation, work habits, study skills, chronological age, health, social and family adjustment, and economic status in all probability should be given serious consideration in any discussion of academic success in colleges and universities. Cognizance has been taken of the fact, as pointed out in Chapter II, that some students tend to exceed academic expectations, as based upon psychological test scores and previous scholarship, while others fail to live up to scholastic promise.[1]

In Chapter I it was stated that in the current study scholastic achievement refers to grades and grade-point averages. Granted that college success implies a great deal more than credit hours earned and marks received, nevertheless, for the purposes of this investigation academic achievement expressed in the form of grades, serves as the most appropriate criterion of success. As indicated above, the present study is designed to investigate the first of the two major obstacles faced by the disabled veteran, namely, the prediction of success in the education or training program leading to a vocational objective. The provisions of the Rehabilitation Act,

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[1]Henry Borow, "The Measurement of Academic Adjustment," Journal American Association College Registrars, XXII (April, 1947), 387-96.

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[1]Henry Borow, "The Measurement of Academic Adjustment," Journal American Association College Registrars, XXII (April, 1947), 387-96.

Public Law 16, 78th Congress, makes it mandatory that veterans show satisfactory educational progress in accordance with the standards of the institution concerned, in order to be eligible for the benefits under this law. Institutions of higher learning continue to measure performance, and therefore academic success, in terms of grades and grade-point averages. This applies to both veterans and non-veterans. Therefore, there appears to be no alternative to the utilization of this standard in the current study as a criterion of scholastic success.

STATISTICAL ANALYSIS

The following statistical techniques were utilized in conducting the current investigation. As was pointed out in Chapter III, means were computed from the various measures of central tendency, and dispersion or variability within the distributions was indicated by square roots of unbiased estimates of the variances.[1] Coefficients of correlation were computed as measures of the extent of linear relationship between variables. These coefficients were calculated by the Pearson product-moment method in accordance with the following derived formula:[2]

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[1]Henry E. Garrett, Statistics in Psychology and Education, (New York: Longmans, Green and Company, 1947), 65.

[2]Garrett, op. cit., p. 292.

$$r = \frac{N\Sigma XY - \Sigma X \cdot \Sigma Y}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

Tests of the obtained simple or first-order coefficients of correlation at the 5 percent and 1 percent confidence levels were made by means of tables published by Snedecor.[1] The technique of multiple correlation was employed as a means of measuring the extent of linear relationship between a dependent variable (criterion score) and two or more independent variables. Convenient tables are provided by Snedecor[2] wherein the 5 percent and 1 percent values of r have been entered for two variables. These tables were used to test the multiple correlations at the 5 percent and 1 percent levels of confidence.

PREDICTING SCHOLASTIC SUCCESS OF DISABLED VETERANS

The relationship between certain variables and the college achievement of the 456 disabled veterans included in this study is given in Table XXIV. Although two of the above correlation coefficients are significant at the 1 percent level, neither of them appears particularly high. A probable explanation of the relatively low

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[1] George W. Snedecor, Statistical Methods, (Ames, Iowa: State College Press, 1946,) 222-225.

[2] Ibid, pp. 350-351.

TABLE XXIV

RELATIONSHIP BETWEEN CERTAIN VARIABLES AND COLLEGE ACHIEVEMENT OF 456 DISABLED VETERANS

Variables	r
Age	-.042
Number of dependents	.045
Percent of disability	.064
Months in armed services	-.030
High school grade-point average	.290**
A C E percentile rank	.263**
Rank at time of discharge	-.032

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

correlations may be that the subjects of this study constitute a select group by virtue of having completed certain formal educational requirements. In these as in subsequent considerations of relationships between variables, it is well to keep in mind this factor of selectivity. Percentile ranks on the A C E and high school grade-point averages were weighted heavily as bases for the original selection of educational and vocational objectives. Any interpretation of relationships consequently must take this fact into consideration.

It may be noted in Table XXIV that there is a very slight negative relationship between college scholastic achievement and such predictive variables as age, months in armed services and rank at time of discharge. Although the correlation coefficient of -.042 between age and college scholastic achievement is not significant at either the 1 or 5 percent levels of confidence, nevertheless this may indicate a slight tendency for older students to make better scholastic grades in college than younger students. If such is the case, these results would be in agreement with the findings of Dwyer[1] and Schaffer,[2] whose investigations revealed a negative relationship

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[1]Paul Dwyer, "Correlation Between Age at Entrance and Success in College," Journal of Educational Psychology, XXX (April, 1939), 251-263.

[2]Robert H. Schaffer, "Note on the Alleged Scholastic Superiority of Veterans," School and Society, LXVII (March 13, 1948), 205.

between age and scholarship. Dwyer's studies, however, indicated a positive trend beyond the age of twenty-one. The factor of selectivity again may enter into this situation. One must consider the fact that veteran students as a group were considerably older than the individuals comprising Dwyer's study and it is possible that the age range of veterans differed from the age range of civilian students who entered institutions of higher learning prior to World War II.

With reference to the relation of scholastic aptitude to college scholarship, the correlation coefficient of .263 between college achievement and the A C E (Table XXIV) is somewhat lower than the coefficients of correlation found in the various investigations reviewed in Chapter II. In the studies reviewed by Borow,[1] a median correlation of .45 was derived when intelligence tests were used as the sole predictor of academic success. Harston and Sprow[2] on correlating a number of psychological test scores with first semester grades noted that the psychological test scores predicted freshmen grades better than they predicted total college scholarship. Borow[3] has suggested that the limited predictive value of scholastic aptitude tests may reside partly in their failure

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[1]Borow, op. cit., pp. 14-26.

[2]Harston and Sprow, op. cit., pp. 387-398.

[3]Borow, op. cit., pp. 14-26.

to appraise the non-intellectual determinants of academic performance. It would seem, therefore, that there are several factors which should be considered in interpreting the comparatively low correlation coefficient of .263 between the A C E percentile rank and college success. First, college scholarship as utilized in this study refers to the grade-point average for the veteran's total college attendance, which in the large majority of instances was eight semesters or more. While higher coefficients of correlation were found in the numerous investigations referred to in Chapter II, the criterion employed in most of those studies was first semester or freshman grades. A lower degree of predictive efficiency may, therefore, be expected to obtain in the current study inasmuch as total college scholarship is employed as the criterion variable rather than first semester or freshman grade-point averages. Second, it is perhaps not justifiable to discount entirely the non-intellectual determinants of academic performance referred to by Borow.[1] It is entirely possible that these non-intellectual determinants may play a more important role in the academic performance of adult disabled veterans than in the scholastic success of youth who entered college immediately following graduation from high school. It is extremely difficult to measure the effect upon academic performance

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[1]Borow, Ibid.

of such factors as the veterans' varied experiences, sense of responsibility, sincerity of purpose, social and emotional maturity, motivation, and many others. The differences in the backgrounds which these two types of students bring to the college situation, therefore, may in part account for the lower relationship between scholastic aptitude and college scholarship indicated in the current investigation. Third, it would appear that the factor of selectivity, previously mentioned, would tend to lower the coefficients of correlation obtained in this study. While both groups, the civilian youth basic to the studies reviewed in Chapter II and the disabled veterans studied in this investigation, constitute select arrays, in all probability the veterans are the more highly selected of the two. This can be explained by the fact that the provisions of the Rehabilitation Act, Public Law 16, make it mandatory that before a disabled veteran may be permitted to enroll in a course of education or training he must demonstrate, through performances on psychological tests and previous scholarship, that he possesses the aptitudes necessary for the successful completion of the particular course selected. It is possible, therefore, that in the original selection these factors were weighted more heavily in the case of the disabled veteran than in the selection of the civilian student.

The wide range of coefficients of correlation between high school grades and other criteria reported by the investigators referred to in Chapter II reflects the wide variations that exist among high schools and institutions of higher learning in academic standards and marking techniques. The coefficient of correlation of .290 between college scholastic achievement and high school grade-point average obtained in the current study (Table XXIV) is considerably lower than the correlation coefficients indicated by Ashmore,[1] Segel[2] and Smith.[3] Perhaps in the interpretation of this correlation coefficient consideration should be given to the findings of Douglas[4] and Kronenberg.[5] In reporting certain studies at the University of Minnesota, Douglas[6] indicates that the relationship between patterns of high school subjects and college achievement was negligible. The results of Kronenberg's[7] study of students in the General College of the University of Minnesota appear to agree with Douglas's findings. The results of the Eight Year Study by the

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[1]Ashmore, op. cit., pp. 219-230.

[2]Segel, op. cit., p. 60.

[3]Smith, op. cit., pp. 167-176.

[4]Douglas, op. cit., pp. 182-186.

[5]Kronenberg, op. cit., p. 83.

[6]Douglas, op. cit., pp. 182-186.

[7]Kronenberg, op. cit., p. 83.

Progressive Education Association reported by Aikin[1] also indicate that special high school subject matter patterns are not necessarily essential for the academic success of college students. While the correlation coefficient of .290 between college success and high school grade-point averages (Table XXIV) indicates some prognostic significance, it apparently would have little value as the sole predictor of college scholarship.

The findings in the present study in regard to high school grade-point averages and college scholastic aptitude as measured by the A C E appear to agree with Douglas's[2] summarization of the results of the University of Minnesota studies. The findings in those investigations indicated that there was no predictive variable which was of much value for all schools and colleges of the University of Minnesota. The individuals comprising the present investigation were studying a great variety of subjects in preparation for numerous occupations, as indicated in Table XIV, Chapter III. Also, these veterans were enrolled in many different schools and colleges of large universities, which perhaps is an additional factor to be taken into consideration in accounting for the comparatively low correlation coefficients between academic success and such predictive variables as scholastic aptitude and high school scholarship.

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[1]Aikin, op. cit., p. 111.

[2]Douglas, op. cit., pp. 182-186.

One may note in Table XXIV no significant relationship between college scholastic achievement and percent of disability or length of military service. This means that for the 456 veterans in question high school grade-point averages and the percentile rank on the A C E are the only predictive variables which appear to have any significant or consistent relationship with college scholarship. As previously mentioned, it is doubtful if either of these variables, used alone, would constitute a wholly reliable forecast of the scholastic success of disabled veterans. Some prognostic significance may be expected to obtain as a result of combining these variables with certain other indices in a predictive battery. A consideration of such combinations of variables will be discussed later in this chapter.

Amputations and Disabilities of the Bones, Muscles, Tendons and Joints

An inspection of the data presented thus far has been confined to a consideration of the effectiveness or validity of certain variables in predicting the scholastic success of disabled veterans without regard to the veteran's specific disability. An analysis of these data, taking into consideration the type of service-related disability, may provide indications as to the usefulness of these variables for predicting probable scholastic achievement of veterans with specific kinds of disabilities.

Consideration will first be given to those subjects with amputations and disabilities of the bones, muscles, tendons and joints. There were 180 veterans in the current study with these types of disabilities. Table XXV shows the coefficients of correlations between certain variables and the scholastic achievement of these veterans. It may be noted that the high school grade-point average is the only variable which is significantly related to the scholastic success of this group of subjects. Some positive relationship is indicated between academic success and such variables as number of dependents, percent of disability and the performance on the A C E. A slight negative relationship appears to exist between the high school record and such factors as age and length of military service. These correlation coefficients, however, are not significant at either the 1 percent or 5 percent levels of confidence. Although the correlation coefficient of .361 is comparatively low, high school grades and grade-point averages do provide for this group of individuals a more accurate basis for the prediction of college scholarship than do any other variables. This finding appears to agree with the studies

TABLE XXV

THE RELATIONSHIP BETWEEN CERTAIN VARIABLES AND COLLEGE ACHIEVEMENT OF 180 VETERANS WITH AMPUTATIONS AND DISABILITIES OF THE BONES, MUSCLES, TENDONS, AND JOINTS

Variables	r
Age	-.059
Number of dependents	.141
Percent of disability	.157
Months in armed services	-.057
High school grade-point average	.361**
A C E percentile rank	.109
Rank at time of discharge	.007

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

by Ashmore,[1] Segel[2] and Smith.[3] The higher correlation coefficients obtained by those investigators may be attributed to the fact that first semester or first year college grades were used as the criteria variables rather than the subjects' total scholarship. Smith[4] noted in his investigations that there was a tendency for any record to lose prognostic value after a year or two. In the case of the typical disabled veteran, there was a lapse of time of from seven to eight years between graduation from high school and entrance into college. It is possible, therefore, that such factors as the lapse of time between graduation from high school and entrance into college, the utilization of total scholarship rather than freshman grades as the criterion, the high degree of selectivity of subjects, and the influence of the non-intellectual determinants may have contributed to a lowering of the coefficient of correlation obtained in the current study between total college scholarship and high school grade-point averages.

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[1]Ben Ashmore, "High School Teachers' Marks as Indicators of College Success," Journal of American Association of College Registrars, XXI (January, 1946), 219-230.

[2]David Segel, "Prediction of Success In College," U. S. Office of Education Bulletin, 1934, No. 15. Washington: Government Printing Office, 1934. P. 88.

[3]Smith, op. cit., pp. 167-176.

[4]Ibid.

Neuropsychiatric Disabilities

Of the 456 individuals in the current study, ninety-four were discharged from the military service because of neuropsychiatric disabilities. An inspection of Table XXVI shows the relationship between certain variables and the college scholastic achievement of these veterans. It may be noted that the only predictive variable which shows a significant degree of relationship with scholastic success at the 1 percent level is the A C E percentile rank. The correlation coefficient of .441 is higher than any of the other correlations obtained thus far for the various disability categories. This correlation coefficient is more in agreement with the findings of the investigators previously mentioned. Segel's[1] studies show a median correlation of .48. In using the scores obtained on the Ohio State Psychological Examination, Harston and Sprow[2] showed a correlation of .44 with college grades for seven semesters' work. Our results also agree with Borow's[3] findings wherein he derived a median correlation coefficient of .45, using the scores earned on intelligence tests as the sole predictor of college scholastic performance.

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[1]Segel, op. cit., p. 60.

[2]Harston and Sprow, op. cit., pp. 387-398.

[3]Borow, op. cit., pp. 14-26.

TABLE XXVI

THE RELATIONSHIP BETWEEN CERTAIN VARIABLES AND COLLEGE ACHIEVEMENT OF NINETY-FOUR VETERANS WITH NEUROPSYCHIATRIC CONDITIONS

Variables	r
Age	-.022
Number of dependents	-.042
Percent of disability	.142
Months in armed services	-.110
High school grade-point average	.074
A C E percentile rank	.441**
Rank at time of discharge	-.078

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

While the correlation coefficient of .441 is somewhat higher than any obtained thus far in the study, the question arises as to just how valuable are scores on scholastic aptitude tests, used independently of all other factors, in forecasting how well an individual will perform scholastically in a college situation. According to Borow[1] a correlation of .45 indicates that the accuracy with which the college performance of a new student may be forecast by the score obtained on a scholastic aptitude test is only about 11 percent better than the accuracy resulting from sheer guesswork. In interpreting the correlation coefficient of .441 it is necessary to consider the fact that by having survived and completed certain educational requirements the range of abilities within this group of disabled veterans is greatly restricted. For example, if all of the disabled veterans who filed applications for a course of education or training under the Rehabilitation Act without regard to their aptitudes, interests and achievement had been entered in a course of education in a college or university, the range of scores on scholastic aptitude tests as well as the distribution of high school and college scholastic grades would have been much greater. Consequently, the correlation coefficient between performance on the A C E and college

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[1] Ibid.

scholastic success would be considerably higher than .441. Therefore, in evaluating Borow's[1] statement, perhaps consideration should be given to the factor of selectivity previously mentioned and to the amount of guesswork which has been eliminated from the prediction by virtue of the fact that these veterans successfully survived certain educational prerequisites prior to their enrolling in a college or university.

The very low correlation coefficient of .074 between high school grade-point average and college achievement indicated in Table XXVI differs considerably from the correlations obtained for this variable with respect to the other disability categories considered thus far. The above correlation shows that apparently no reliance can be placed on this index as a predictor of college academic success in the case of veterans with neuropsychiatric disabilities.

Apparently the other variables indicated in Table XXVI have little if any value for predicting scholastic success for the neuropsychiatric veteran. Percent of disability shows a positive correlation of .42 with college achievement, but with a group of this size it is much too low to be considered significant at either the 5 or 1 percent level of confidence. Age, number of

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[1] Ibid.

dependents, length of service and rank at time of discharge indicate slight negative relationships with scholastic success, but none of these correlation coefficients can be considered significant.

Disabilities of the Skin and Communicable Infectious Diseases

Table XXVII indicates the relationship between certain variables and the college achievement of sixty-three veterans with communicable infectious diseases and disabilities of the skin. The data in this table reveal two variables which apparently have some usefulness in predicting probable scholastic success in an institution of higher learning for this group of subjects. The high school grade-point average correlates significantly with college scholastic achievement at the 1 percent level of confidence while the A C E percentile rank shows a significant relationship at the 5 percent level. The factors which may account for the fact that these correlation coefficients are lower than those obtained in the investigations reported in Chapter II were previously discussed in connection with the analysis of the data concerning other disability categories.

The coefficient correlation of -.026 between age and scholastic success (Table XXVII) differs slightly from

TABLE XXVII

THE RELATIONSHIP BETWEEN CERTAIN VARIABLES AND COLLEGE ACHIEVEMENT OF SIXTY-THREE VETERANS WITH DISABILITIES OF THE SKIN AND COMMUNICABLE INFECTIOUS DISEASES

Variables	r
Age	-.026
Number of dependents	-.131
Percent of disability	-.120
Months in armed services	-.129
High school grade-point average	.386**
A C E percentile rank	.287*
Rank at time of discharge	-.050

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

Dwyer's[1] findings and is too low to be considered significant. As previously mentioned, Dwyer[2] maintains that universally there is a negative relationship between the ages of freshmen and their scholastic success which is usually measured by a correlation coefficient of from .00 to .25. This negative trend appears to continue up to an entering age of twenty-one and a positive trend from age twenty-two. A lower correlation coefficient should therefore be expected in the current study, in view of the fact that the mean age of the disabled veteran upon entering college was twenty-six years.

The other indices, number of dependents, length of military services, percent of disability and rank at time of discharge, show a negative coefficient of correlation with academic success. With reference to the veterans' marital status and number of dependents, it would appear that the correlations obtained thus far would not agree with the findings reported by Epler,[3] Orr,[4] and

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[1]Paul Dwyer, "Correlation Between Age at Entrance and Success in College," Journal of Educational Psychology, XXX (April, 1939), 251-263.

[2]Ibid.

[3]Stephen B. Epler, "Do Vets Make Better Grades Than Non Vets," School and Society, LXVI (October 4, 1947), 270.

[4]A. M. Orr, "Grade Point Averages of Veterans at Oklahoma A and M College," School and Society, LXVI (August 2, 1947), 94.

Riemer.[1] All three of these investigators found that married veterans with children made better grades than did single veterans. The results of the current study reported thus far indicate that the only positive relationship between college scholarship and number of dependents was in the case of the 180 veterans with disabilities of the bones, muscles, tendons and joints. The correlation coefficient in this instance was only .141 (Table XXV) and certainly cannot be considered statistically significant. In the other disability categories examined thus far, a negative correlation coefficient has been found. As a matter of fact, these negative correlations are low and fail to show any significant relationship, positive or negative, between the veteran's marital status, number of dependents and college success.

Disabilities of the Eye, Ear, Nose, Throat, Respiratory and Circulatory Conditions

The largest coefficient of correlation obtained in the entire study, .517, measures the relationship between the A C E percentile rank and the college scholastic achievement of seventy-five veterans with disabilities of the eye, ear, nose, throat and respiratory and circulatory conditions. This correlation coefficient (Table XXVIII) is significant at the 1 percent level of confidence. A lower degree of predictive efficiency may

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[1]Svend Riemer, "Married Veterans Are Good Students," Marriage Family Living, IX (June, 1947), 11-12.

TABLE XXVIII

THE RELATIONSHIP BETWEEN CERTAIN VARIABLES AND COLLEGE ACHIEVEMENT OF SEVENTY-FIVE VETERANS WITH DISABILITIES OF THE EYE, EAR, NOSE, THROAT, AND RESPIRATORY AND CIRCULATORY SYSTEMS

Variables	r
Age	.186
Number of dependents	.228
Percent of disability	.152
Months in armed services	.148
High school grade-point average	.269*
A C E percentile rank	.517**
Rank at time of discharge	-.097

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

be expected to obtain between high school grades and college scholarship of this group, since the correlation coefficient of .269 is significant at the 5 percent level. All the remaining coefficients in Table XXVIII, with the exception of rank at the time of discharge, correlate positively with college scholarship. But little if any significance can be attached to these correlations in predicting academic success. The positive trend of these correlations in Table XXVIII, however, does differ from the more or less consistently negative relationships which have been discussed thus far in this chapter.

The correlation coefficient of .186 between age and scholastic success of these seventy-five subjects appears to agree with Dwyer's[1] findings, mentioned above, to the effect that older college students tend to make better grades than do younger students. Moreover, the positive correlation of .228 between number of dependents and scholastic achievement indicates a tendency for the veterans of this group who are married and have children to make better grades in college than do single veterans. While this coefficient of .228 fails to indicate any significant relationship between scholastic achievement and number of dependents at either the 1 percent or 5 percent level, it would appear that there is a tendency

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[1]Dwyer, op. cit., pp. 251-263.

for these findings to agree with the results reported by Epler,[1] Orr,[2] and Riemer,[3] referred to above.

Miscellaneous Disabilities

A correlation coefficient of .416 was found between the A C E percentile rank and college scholastic achievement of the forty-four veterans with miscellaneous disabilities (Table XXIX). This measure indicates some prognostic significance at the 1 percent level of confidence. Another correlation (.304) does not indicate any significant or consistent relationship between high school grades and college academic success. The only other positive correlation (.270) in this group of veterans concerns the factor of percent of disability as a variable. It is considerably higher than the correlation coefficients for these variables in the other disability categories. Therefore, with this particular group of veterans there appears to be a tendency for individuals with a high percent of disability to make better grades in college than do the less disabled. It is perhaps not justifiable, however, to emphasize this possibility too strongly in view of the fact that the correlation coefficient of .270

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[1]Epler, op. cit., p. 270.

[2]Orr, op. cit., p. 94.

[3]Riemer, op. cit., pp. 11-12.

TABLE XXIX

THE RELATIONSHIP BETWEEN CERTAIN VARIABLES AND COLLEGE ACHIEVEMENT OF FORTY-FOUR VETERANS WITH MISCELLANEOUS DISABILITIES

Variables	r
Age	-.236
Number of dependents	-.019
Percent of disability	.270
Months in armed services	-.027
High school grade-point average	.304
A C E percentile rank	.416**
Rank at time of discharge	-.198

Key:

**Significant at the 1 percent level
*Significant at the 5 percent level

is significant neither at the 1 percent or 5 percent level of confidence.

With respect to the factors of age and rank at the time of discharge, Table XXIX discloses higher negative correlation coefficients than heretofore obtained. With this group of veterans it would appear that the older individuals and those with higher military ranks at the time of discharge tended to make lower scholastic grades in college. Such a tendency, however, cannot be considered significant in view of the low coefficients of correlation and the comparatively small number of cases in the group.

INTERCORRELATIONS BETWEEN PREDICTIVE VARIABLES

The intercorrelations of the predictive variables utilized in this study are reported in Tables XXX to XXXV, inclusive. In no instance is there any great degree of overlapping among the variables as predictors of college grades.

These tables reveal that the most consistent positive relationship is found between age and length of service. The coefficients of correlation between these indices range from .298 for neuropsychiatric disabilities (Table XXXII) to .575 for disabilities of the skin and communicable diseases (Table XXXIII). It was expected that age would correlate significantly with length of

TABLE XXX

INTER-CORRELATIONS AMONG CERTAIN PREDICTIVE VARIABLES IN THE STUDY OF 456 DISABLED VETERANS

Variables	r
Age, with number of dependents	.190
Age, with length of service	.408
Age, with A C E	.031
Age, with rank at discharge	.223
Number of dependents with length of service	.126
Number of dependents with A C E	.005
Percent of disability with length of service	.023
Percent of disability with A C E	-.023
Percent of disability with rank at time of discharge	-.180
Length of service with A C E	.042
Length of service with rank at time of discharge	.377
High school grades with A C E	.228

TABLE XXXI

INTER-CORRELATIONS AMONG CERTAIN PREDICTIVE VARIABLES IN THE STUDY OF 180 VETERANS WITH AMPUTATIONS AND DISABILITIES OF THE BONES, MUSCLES, TENDONS AND JOINTS

Predictive Variables	r
Age, with number of dependents	.299
Age, with length of service	.349
Age, with A C E	.004
Age, with rank at discharge	.193
Number of dependents, with length of service	.118
Number of dependents, with A C E	-.055
Percent of disability, with length of service	-.063
Percent of disability, with A C E	-.115
Percent of disability, with rank at discharge	-.223
Length of service, with A C E	.007
Length of service, with rank at discharge	.423
High school grades with A C E	.258

TABLE XXXII

INTER-CORRELATIONS AMONG CERTAIN PREDICTIVE VARIABLES IN THE STUDY OF NINETY-FOUR VETERANS WITH NEUROPSYCHIATRIC DISABILITIES

Predictive Variables	r
Age with number of dependents	.020
Age, with length of service	.298
Age, with A C E	.036
Age, with rank at discharge	.258
Number of dependents with length of service	.088
Number of dependents with A C E	.093
Percent of disability, with length of service	.137
Percent of disability with A C E	.030
Percent of disability with discharge rank	-.020
Length of service, with A C E	.032
Length of service, with discharge rank	.460
High school grades with A C E	.104

TABLE XXXIII

INTER-CORRELATIONS AMONG CERTAIN PREDICTIVE VARIABLES IN THE STUDY OF SIXTY-THREE VETERANS WITH DISABILITIES OF THE SKIN, AND COMMUNICABLE INFECTIOUS DISEASES

Predictive Variables	r
Age, with number of dependents	.247
Age, with length of service	.575
Age, with A C E	.056
Age, with rank at discharge	.110
Number of dependents, with length of service	.240
Number of dependents, with A C E	-.187
Percent of disability, with length of service	.286
Percent of disability, with A C E	-.047
Percent of disability, with rank at discharge	-.115
Length of service, with A C E	-.070
Length of service, with rank at discharge	.333
High school grades, with A C E	.427

TABLE XXXIV

INTER-CORRELATIONS AMONG CERTAIN PREDICTIVE VARIABLES IN THE STUDY OF SEVENTY-FIVE VETERANS WITH DISABILITIES OF THE EYE, EAR, NOSE AND THROAT, AND RESPIRATORY AND CIRCULATORY SYSTEMS

Predictive Variables	r
Age, with number of dependents	.217
Age, with length of service	.463
Age, with A C E	.145
Age, with rank at discharge	.261
Number of dependents, with length of service	.137
Number of dependents, with A C E	.049
Percent of disability, with length of service	-.047
Percent of disability, with A C E	.113
Percent of disability, with rank at discharge	-.319
Length of service with A C E	.143
Length of service with discharge rank	.276
High school grades with A C E	.202

TABLE XXXV

INTER-CORRELATIONS AMONG CERTAIN PREDICTIVE VARIABLES IN THE STUDY OF FORTY-FOUR VETERANS WITH MISCELLANEOUS DISABILITIES

Predictive Variables	r
Age, with number of dependents	.262
Age, with length of service	.523
Age, with A C E	-.122
Age, with rank at discharge	.347
Number of dependents with length of service	.278
Number of dependents with A C E	.240
Percent of disability, with length of service	.016
Percent of disability, with A C E	.225
Percent of disability, with rank at discharge	.035
Length of service, with A C E	-.005
Length of service, with rank at discharge	.217
High school grades, with A C E	.142

service inasmuch as these two factors tend to go along together.

Age also correlates positively with number of dependents, but the coefficients are not so high as for age and length of service. For number of dependents the range is from .020 (Table XXXII) to .299 (Table XXXI).

There is a fairly consistent relationship in all of the disability categories between age and rank at time of discharge from the military service. The lowest correlation coefficient between these two variables is .110 for veterans with disabilities of the skin and infectious diseases (Table XXXIII). The highest correlation is .347 for veterans with miscellaneous disabilities (Table XXXV).

Another consistently positive relationship is that between length of service and rank at time of discharge. The range in this instance is from .217 for forty-four veterans with miscellaneous disabilities (Table XXXV) to .460 for neuropsychiatric veterans (Table XXXII).

Throughout this study, high school grades appear to correlate positively with A C E percentile ranks although the coefficients in question are not so high as expected. The highest correlation is .427 (Table XXXIII) and the lowest, .104 (Table XXXII).

These tables indicate that the greatest overlapping occurs among the variables wherein age is an important

factor. Thus, as expected, there is an observable tendency for the older veterans, as a group, to have a larger number of dependents, a longer period of military service and a higher military rank at the time of discharge from the armed services. No significant degree of relationship, however, was found between high school grades and performance on the A C E. The lack of relationship between these predictors may be somewhat unexpected, but in light of the limitation imposed on the validity coefficient by the unreliability of scholastic grades reported earlier and the uncontrolled environmental and non-intellectual variables known to affect academic performance, the fact that there is very little if any relationship between these variables is not surprising.

PREDICTIVE VALUE OF COMBINATIONS OF VARIABLES

In an attempt to determine the predictive value of combinations of indices, several different multiple correlations were computed. For this purpose various teams of predictive variables were used.

The multiple correlations obtained by selecting a team of significantly predictive variables are shown in Table XXXVI. With respect to the entire group of 456 disabled veterans, the high school grade-point average

TABLE XXXVI

MULTIPLE CORRELATIONS BETWEEN COLLEGE GRADE-POINT AVERAGE AND COMBINATION OF VARIABLES AMONG 456 DISABLED VETERANS

Predictive Variables	r
High school grade-point average only	.290
High school grade-point average, and percentile rank on A C E	.353
All variables	.368

correlates with college scholastic grades to the extent of .290. When the performance on the A C E was combined with the high school grade-point average, predictive efficiency is increased to .353. An analysis of the correlation coefficients in Table XXXVI indicates that the addition of all of the predictive variables to the battery otherwise composed of high school grades and A C E percentile ranks, fails to bring about any significant increase in the degree of correlation or in the predictive accuracy of the battery. The multiple correlation of .368 obtained between all predictive variables and college scholastic success for the entire group of subjects studied in this investigation is considerably lower than the multiple correlation of .81 obtained by Edds[1] and McCall in the investigation they conducted wherein they employed a combination of high school grades, Otis I.Q. and Cross English test scores. This lower degree of correlation may be caused by several factors such as the predictive efficiency of the measuring instruments originally employed, greater restriction in the range of abilities of the individuals comprising the group currently studied, and the uncontrolled environmental and non-academic factors previously mentioned.

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[1]J. H. Edds and W. M. McCall, "Predicting the Scholastic Success of College Freshmen," Journal of Educational Research, XXVII (October, 1933), 127-130.

Table XXXVII gives the multiple correlations between college scholastic grade-point averages and a combination of variables among 180 veterans with amputations and disabilities of the bones, muscles, tendons and joints. A correlation coefficient of .361 between high school grade-point average and college scholastic scholarship is recorded there. When percent of disability is added to the high school scholastic record a multiple correlation of .396 is obtained. The inclusion of number of dependents and percentile rank on the A C E increases the correlation to only .427. Thus the prognostic quality of the battery is not improved to any great extent by so doing.

Multiple correlations computed between college scholastic grades and a team of significant predictors for the ninety-four veterans who were discharged from the armed services with neuropsychiatric disability conditions are listed in Table XXXVIII. There it is seen that the A C E percentile rank has some usefulness in predicting probable scholastic achievement in college for this group of veterans, but the predictive value of this index is increased very slightly through a combination with other variables. Performance on the A C E correlates .441 with college academic success when used as the sole predictor, independent of all other variables. When percent of disability and length of service with the A C E

TABLE XXXVII

MULTIPLE CORRELATIONS BETWEEN COLLEGE GRADE-POINT AVERAGE AND COMBINATION OF VARIABLES AMONG 180 VETERANS WITH AMPUTATIONS, AND DISABILITIES OF THE BONES, MUSCLES, TENDONS AND JOINTS

Predictive Variables	r
High school grade-point average only	.361
High school grade-point average, and percent of disability	.396
High school grade-point average, percent of disability and number of dependents	.425
High school grade-point average, percent of disability, number of dependents, and percentile rank on A C E	.427

TABLE XXXVIII

MULTIPLE CORRELATIONS BETWEEN COLLEGE GRADE-POINT AVERAGE AND COMBINATION OF VARIABLES AMONG NINETY-FOUR VETERANS WITH NEUROPSYCHIATRIC CONDITIONS

Predictive Variables	r
Percentile rank on A C E only	.441
Percentile rank on A C E, and percent of disability	.459
Percentile rank on A C E, percent of disability, and number of months in armed services	.481

percentile rank are combined to form a predictive battery, the predictive relationship is increased to only .481.

Multiple coefficients were also computed for sixty-three veterans with disabilities resulting from conditions of the skin and communicable infectious diseases (Table XXXIX). A positive correlation coefficient of .386 was found for high school grades and scholastic success. The accuracy of this predictor also tends to increase, it may be noted, when performance on the A C E is included with the prognostic indices. By adding the variable, number of dependents, to the predictive battery, the multiple correlation is increased to .428. The inclusion of percent of disability and length of military service apparently fails to bring about any significant increase in the multiple correlation.

Multiple coefficients for the seventy-five cases of eye, ear, nose, throat, and respiratory and circulatory disabilities are recorded in Table XL. Here percentile rank on the A C E is the basic variable. Alone, it correlates .517 with scholastic marks. This degree of prognostic significance is increased to .544 when high school grade-point average is included. While this combination may be used with confidence for estimating the probable scholastic performance of this group of subjects, the inclusion of number of dependents and percent of disability adds significantly to the degree of

TABLE XXXIX

MULTIPLE CORRELATIONS BETWEEN COLLEGE SCHOLASTIC GRADE-POINT AVERAGE AND COMBINATION OF VARIABLES AMONG SIXTY-THREE VETERANS WITH DISABILITIES OF THE SKIN, AND COMMUNICABLE INFECTIOUS DISEASES

Predictive Variables	r
High school grade-point average only	.386
High school grade-point average, and percentile rank on A C E	.409
High school grade-point average, percentile rank on A C E, and number of dependents	.428
High school grade-point average, percentile rank on A C E, number of dependents, and percent of disability	.435
High school grade-point average, percentile rank on A C E, number of dependents, percent of disability, and number of months in armed services	.436

TABLE XL

MULTIPLE CORRELATIONS BETWEEN COLLEGE SCHOLASTIC GRADE-POINT AVERAGE AND COMBINATION OF VARIABLES AMONG SEVENTY-FIVE VETERANS WITH DISABILITIES OF THE EYE, EAR, NOSE, AND THROAT, AND RESPIRATORY AND CIRCULATORY CONDITIONS

Predictive Variables	r
Percentile rank on A C E	.517
Percentile rank on A C E, and high school grade-point average	.544
Percentile rank on A C E, and high school grade-point average, and number of dependents	.569
Percentile rank on A C E, high school grade-point average, number of dependents, and age	.579
Percentile rank on A C E, high school grade-point average, number of dependents, age, and percent of disability	.594
Percentile rank on A C E, high school grade-point average, number of dependents, age, percent of disability, and number of months in armed services	.594

multiple correlation and increases the predictive accuracy of the battery. It may be noted when length of military service is added to this predictive battery, otherwise composed of such indices as A C E percentile rank, high school grades, number of dependents and percent of disability, no improvement in its predictive efficiency is gained.

Table XLI gives the multiple correlations between college scholastic achievement and combinations of variables among forty-four veterans with miscellaneous disabilities. In forecasting the college scholarship of these veterans, it is apparent that percentile rank on the A C E in conjunction with other indices constitutes a fairly reliable basis for estimating academic success. Performance on the A C E alone correlates .416 with scholastic performance. Accuracy of prediction is increased when other variables are added: high school grades, percent of disability, age, and military rank at time of discharge from service. By combining these variables into a predictive battery, the resultant multiple correlation between college scholarship is raised to .556. It is obvious, therefore, that this combination is superior to any of the variables alone as a means of estimating an individual's chances for success in a college situation.

TABLE XLI

MULTIPLE CORRELATIONS BETWEEN COLLEGE SCHOLASTIC GRADE-POINT AVERAGE AND COMBINATION OF VARIABLES AMONG FORTY-FOUR VETERANS WITH MISCELLANEOUS DISABILITIES

Predictive Variables	r
Percentile rank on A C E	.416
Percentile rank on A C E and high school grade-point average	.484
Percentile rank on A C E, high school grade-point average, and percent of disability	.506
Percentile rank on A C E, high school grade-point average, percent of disability, and age	.529
Percentile rank on A C E, high school grade-point average, percent of disability, age, and military rank at time of discharge	.556

CONCLUSION

In general the correlations between the seven predictive variables and the college scholarship of the 456 veterans in this study tend to be small. The writer believes that these comparatively low correlations may be accounted for as follows:

1. The individuals studied in this investigation constitute a select group by virtue of having survived and completed certain educational requirements. A lower degree of predictive efficiency may, therefore, be expected as a result of this restriction of the range of ability.

2. The uncontrolled environmental and non-intellectual variables known to affect academic success play an important role in the scholastic performance of these disabled veterans because of the individual's age, maturity, and varied experiences.

We shall now consider the pattern of interests exhibited by the disabled veterans and the value of these interests in the prediction of scholastic success.

CHAPTER V

DETERMINATION OF FACTORS ASSOCIATED WITH THE VOCATIONAL INTERESTS OF DISABLED VETERANS AND THEIR RELATIONSHIP TO SCHOLASTIC ACHIEVEMENT IN SPECIFIC COLLEGE SUBJECTS

In studying the relationship between the vocational interests of disabled veterans and their scholastic achievement in specific college subjects, four different factors were investigated. Consideration was first given to the interest scores these veterans earned on the Kuder Preference Record. Second, a study was made of the preferences the veterans had indicated in their counseling interviews with respect to the high school subjects they liked best. The high school subject preferences were grouped in the following manner: English and language, social science, mathematics and science, and "the arts." Included in "the arts" were music and art as well as industrial arts. Third, information given by the veteran concerning any employment experience he may have had was considered. Finally, a study was made of the veteran's service experience with special emphasis on service experience of an occupational nature.

Data concerning all four of these factors were available for 348 of the whole array of 456 disabled veterans.

STATISTICAL METHOD EMPLOYED

A modified form of the product-moment coefficient, referred to as tetrachoric r, was calculated for the purpose of determining the relationship between grades earned in specific college subjects and such indices as the veterans interest patterns, high school subject preferences, employment experience and service experience of an occupational nature.

The tetrachoric correlation technique was employed because both variables were dichotomous; i.e., capable of being separated into two categories.[1] Moreover, there was a considerable amount of missing data in connection with these particular variables. This method of correlation assumes that both variables are essentially continuous and that each would be normally distributed in the veteran population comprising the current investigation if measured in sufficiently fine intervals.[2]

An approximate formula for tetrachoric r follows:[3]

$$\frac{ad - bc}{N^2 zz'} = rt + \frac{xx' r^2 t}{2}$$

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[1] Garrett, op. cit., p. 353.

[2] Ibid., p. 354.

[3] Ibid., p. 356.

in which

x and x^1	=	σ distance from the means to the points separating the proportion in the upper category from the proportion in the lower category;
z and z^1	=	the heights of the ordinates at the points of division;
a, b, c, d	=	entries in the four cells;
N	=	number of cases; i.e., sum of entries in the four cells;
r_t	=	the tetrachoric coefficient of correlation.

The method for calculating the many tetrachoric r's in the current study was greatly simplified by the use of computing diagrams devised by Thurstone and his colleagues.[1]

RELATIONSHIPS OF INTERESTS TO ACHIEVEMENT IN SPECIFIC COLLEGE SUBJECTS

Other Studies Concerned with the Value of Interest Tests in Predicting Scholastic Success

There does not appear to be any way that a direct comparison can be made of the relative importance of scholastic aptitude and interest as factors in academic success, but it seems likely that individuals differ as much, if not more, in their interests as in their abilities. It is often popularly assumed that there is a high degree of relationship between ability and interest. This

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[1] L. Chesire, M. Saffir, and L. L. Thurstone, Computing Diagrams for the Tetrachoric Correlation Coefficient. Chicago: University of Chicago Bookstore, 1933.

assumption, however, is questionable in view of the research findings which indicate that interest is by no means always an indication of ability.

Relatively few studies have been made of the value of interest tests to predict academic success in a specific subject or a particular curriculum. The dearth of such studies may be attributed to the fact that tests of this type have thus far been devised to determine the extent to which a person's interests resemble those of individuals engaged in a certain type of work. They have been rarely validated against the scholastic success of students or trainees in a particular subject or curriculum. Although a relationship is often found to exist between interest test scores and subsequent success in training or on the job, these tests were not constructed to predict success and, therefore, it is questionable if they should be evaluated on that basis.

The research studies pertaining to the relationship between interest patterns and scholastic success, reviewed in connection with the current investigation, are primarily concerned with the value of interest test scores in predicting scholastic success in a specific field of study.

Berdie[1] administered the Strong Vocational Interest Blank to 497 freshmen entering the Institute of Technology at the University of Minnesota and secured low correlations of .13 between the Engineer Key and academic achievement and of .10 between the Engineer Key and curriculum satisfaction. Berdie's results seem to indicate that neither academic achievement nor the amount of satisfaction experienced by a student can be predicted by the score obtained on the Engineer Key of the Strong Vocational Interest Blank. A similar low correlation of .14 between scores on the Strong Vocational Interest Blank and first-year college marks was disclosed in a study by Segel and Brintle.[2] Holcomb and Laslett[3] found a correlation of .32 between college grades and engineering scores on the Strong Vocational Interest Blank.

Thompson[4] investigated the relationship between scores on the Kuder Preference Record and honor points

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[1]R. F. Berdie, "Prediction of College Achievement and Satisfaction," Journal of Applied Psychology, XXVIII (June, 1944), 239-45.

[2]David Segel and S. L. Brintle, "The Relation of Occupational Interest Scores as Measured by the Strong Interest Blank to Achievement Test Results and College Marks in Certain College Subject Groups," Journal of Educational Research, XXVII (February, 1934), 442-45.

[3]G. W. Holcomb and R. H. Laslett, "A Prognostic Study of Engineering Aptitude," Journal of Applied Psychology, XVI (April, 1932), 107-15.

[4]C. E. Thompson, "Personality and Interests Factors in Dental School Success," Educational and Psychological Measurement, IV (1944), 209-306.

earned in a four-year course in dentistry for sixty-six dental students. He obtained correlation coefficients of -.10, .28, and -.01 between cumulative points earned in four-year courses in dental theory and technique and scores on the Kuder Preference Record in mechanical interest, scientific interest, and social service interest, respectively. When comparing these interest scores with the cumulative points earned in four-year courses in practicum, Thompson obtained correlation coefficients of .24 with social service interests, .11 with scientific interests, and -.06 with mechanical interests.

Robinson and Bellows[1] inquired into the relationship between interest test scores and grades in technical subjects in the field of dental training. They obtained correlation coefficients ranging from .13 between interest test scores and average grades in first-year courses to .33 between interest test scores and first-year grades in prosthetic technics.

In the University of Minnesota studies in the prediction of scholastic achievement, a median correlation coefficient of .19 was found between scores on interest tests and college scholarship.[2]

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[1]J. B. Robinson and R. M. Bellows, "Characteristics of Successful Dental Students," Journal of the American Association of Collegiate Registrars, XVI (January, 1941), 109-22.

[2]H. R. Douglas and C. M. McCullough, "Prediction of Success in Professional Schools," University of Minnesota Studies in Predicting Scholastic Achievement. Minneapolis: University of Minnesota Press, 1942, Part II, pp. 61-74.

Although these findings demonstrated that interests alone are of little value for predicting academic success or satisfaction, the other benefits which may accrue from their use in the counseling of disabled veterans should not be overlooked. Such tests serve as helpful devices to crystallize the thinking of the counselee with regard to certain fields of occupations, to validate expressed interests, to provide a basis for encouraging the counselee to prepare for a goal which measures of ability have shown to be achievable and to reassure him that he will find the work congenial. Therefore, in view of the results of the above-mentioned investigations, it would appear that the value of interest test scores should not be considered in terms of their effectiveness as indicators of the probable level of an individual's scholastic achievement.

THE RELATION OF VOCATIONAL INTEREST SCORES AS MEASURED BY THE KUDER PREFERENCE RECORD TO SCHOLASTIC ACHIEVEMENT IN SPECIFIC COLLEGE SUBJECTS

In an effort to determine the value of interest patterns for predicting grades of disabled veterans in certain college subjects, coefficients of correlation were computed showing the degree of relationship between the vocational preferences of these veterans and their scholastic performance in certain subject matter fields.

Table XLII reveals that in most instances these correlation coefficients are extremely low. It may be seen that literary interest as measured by the Kuder Preference Record correlates the highest with grades in college English. Yet this coefficient of correlation is only .11, entirely too low to be considered significant. Scientific, persuasive, social science, clerical and musical interests show negative correlations with achievement in college English. It is difficult to account for the negative relationships between grades in English and social science and persuasive interest patterns.

The highest positive coefficient of correlation is .31, between the music key of the Kuder Preference Record and scholastic success in languages. Preference for literary activities correlates .26 with grades in language while mechanical interests shows a negative coefficient of -.39 with linguistic ability.

An examination of the coefficients of correlation in the third column of Table XLII fails to disclose any significant or consistent relationship between scholastic performance in science and scores earned on the Kuder Preference Record. Positive correlations of .11 and .03 were obtained between interest trends in scientific and mechanical activities and grades in science courses. It would appear, however, that such correlations are only slightly better than chance relationships. It may be

TABLE XLII

THE CORRELATION OF VOCATIONAL INTERESTS SCORES ON THE KUDER PREFERENCE RECORD WITH GRADES EARNED BY DISABLED VETERANS IN SPECIFIC COLLEGE SUBJECTS

Vocational Interests	College Subjects				
	English	Language	Science	Social Science	Mathematics
Mechanical	.00	-.39	.03	-.04	-.03
Scientific	-.02	-.03	.11	.06	.19
Persuasive	-.13	-.12	-.30	-.09	-.19
Literary	.11	.26	-.05	-.01	.07
Social science	-.16	-.04	.09	-.00	-.02
Clerical	-.05	.08	-.39	-.08	.05
Artistic	.04	-.08	.00	.00	-.12
Music	-.04	.31	.00	-.01	-.11
Computation	.04	-.14	-.12	.02	.29

noted that the persuasive and clerical interests of these veterans show negative relationships with scholarship in the sciences. The respective correlations are -.39 and -.30.

The very low coefficients of correlation obtained between interest test scores and scholastic success in the social sciences indicate that in predicting scholastic performance in the social science subjects apparently no reliance can be placed on the interest patterns of disabled veterans. Social science interests show a correlation of .00 with scholarship and the highest degree of relationship found is only .06 between academic success in social studies and scientific interests.

Scores on the computational and scientific keys of the Kuder Preference Record have some usefulness in predicting probable achievement in mathematics, although the respective coefficients of .29 and .19 fail to indicate any significant or consistent degree of relationship with scholastic success in that subject. Interests in mechanical, persuasive, social science, artistic, and musical activities, as measured by the Kuder Preference Record for this group of 348 veterans reveal negative relationships with scholarship in mathematics.

The results of the current investigation of interest patterns and their relationship to achievement in specific college subjects appear to agree with the

findings of the research studies previously referred to in this chapter. The correlation coefficient of .13 between the Engineer Key of the Strong Vocational Interest Blank and academic achievement in engineering, secured by Berdie,[1] compares favorably with the correlation coefficients obtained in this study between literary and scientific interest scores on the Kuder Preference Record and achievement in English, social studies and science. The higher correlations of .31 and .29 found in the current study between achievement in language and mathematics, and interest scores in music and scientific activities respectively, seem to agree with Holcomb and Laslett's findings.[2] The results of this study also closely agree with the correlations reported by Thompson,[3] Robinson and Bellows,[4] and Douglas and McCullough.[5]

RELATIONSHIPS OF HIGH SCHOOL SUBJECT PREFERENCES TO ACHIEVEMENT IN SPECIFIC COLLEGE SUBJECTS

The findings concerning the relationships between veterans' high school subject preferences and scholastic achievement in specific college subjects are recorded in Table XLIII. Information concerning the high school

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[1]Berdie, op. cit., pp. 239-245.

[2]Holcomb and Laslett, op. cit., pp. 107-115.

[3]Thompson, op. cit., pp. 209-306.

[4]Robinson and Bellows, op. cit., 109-122.

[5]Douglas and McCullough, op. cit., 61-74.

TABLE XLIII

THE CORRELATION OF HIGH SCHOOL SUBJECT PREFERENCES OF DISABLED VETERANS AND SCHOLASTIC GRADES IN SPECIFIC COLLEGE SUBJECTS

High School Subject Preference	College Subjects				
	English Language	Science	Social Science	Mathematics	
English and language	.16	.15	-.21	.05	-.30
Social science	.15	.15	.02	.02	-.14
Mathematics and science	-.22	-.23	.11	-.10	.23
The arts	.03	.10	.00	.13	.02

subject an individual liked best apparently has little if any more value in estimating his chances for scholastic success in a specific college subject than do scores on interest tests.

Correlations of .16 and .15 respectively were secured between scholastic marks in specific subjects and a preference for high school English and language courses or social science subjects. A negative relationship of -.22 was found between achievement in college English and preference for high school mathematics and science.

The relationship of high school subjects liked best with scholastic performance in college language courses appears to be comparable to the findings in connection with academic success in college English. A preference for high school English and language correlates .15 with achievement in college language while a liking of high school social science subjects indicates an identical degree of relationship with that subject. As in the case of achievement in English, a liking for high school mathematics and science indicated a negative degree of relationship with scholastic success in college language. In this instance the coefficient of correlation was -.23.

Those veterans who best liked mathematics and science in high school appear to have earned high grades in college science courses. The correlation coefficient

of .11 is rather low, however, and does not indicate a significant degree relationship. Preference for high school English and language courses, it may be seen, show a negative correlation of -.21 with grades in college science.

Apparently a preference for "the arts" in high school offers the best indication of scholastic performance in college social science courses, with a correlation coefficient of .13. It is interesting to note that a correlation of only .02 was found between achievement in college social science subjects and a preference for social studies in high school. Again these findings fail to disclose any significant relationships with college achievement.

The highest degree of relationship was found between success in college mathematics and a preference for high school courses in mathematics and science. In this instance the coefficient of correlation is .23. A liking for English, language and social science in high school discloses negative relationships with achievement in college mathematics.

From an analysis of these findings for the 348 veterans in question, one concludes that preference for certain high school subjects is a poor index of success in specific college subjects.

RELATIONSHIPS BETWEEN ACHIEVEMENT IN SPECIFIC COLLEGE SUBJECTS AND EMPLOYMENT AND MILITARY EXPERIENCE

Table XLIV contains data pertaining to the predictive value of occupational experience for success in specific college subjects. Very low correlations were found. It may be seen that employment experience correlates positively in each instance with grades in English, language, science, social science and mathematics, but apparently these correlations are too low to indicate any significant degree of relationship.

Military experience of an occupational nature apparently has no value in predicting success in specific college subjects. It may be seen that a positive trend obtains between service experience and scholastic achievement in college subjects with the exception of achievement in the social sciences. As in the case of employment experience these correlation coefficients are extremely low.

SUMMARY

An analysis of the findings pertaining to the vocational interests, high school subjects preferred and military and employment experience indicates that these indices have little prognostic significance for forecasting how well disabled veterans will perform scholastically in specific college subjects. It is perhaps not justifiable

TABLE XLIV

THE RELATIONSHIP BETWEEN EMPLOYMENT AND SERVICE EXPERIENCE AND SCHOLASTIC PERFORMANCE OF DISABLED VETERANS IN SPECIFIC COLLEGE SUBJECTS

Employment and Service Experience	College Subjects				
	English Language	Science	Social Science	Mathematics	
Employment experience	.21	.09	.02	.04	.09
Military experience	.15	.12	.12	-.12	.13

to discount entirely the value of interests in the counseling of disabled veterans; but as Bingham[1] has indicated, the notion that interest may be construed as an indication of potential ability may well be discounted, and evidence of capacity should be looked for elsewhere. It seems that vocational interests are chiefly useful in judging whether or not individuals will find certain occupational fields congenial and pleasant. Greene[2] has indicated that there is a need for considerable research with respect to the permanence of various types of interests, the types of individuals whose interest patterns fluctuate most, and the effects of counseling and work experience on interest patterns and satisfactory vocational and academic adjustments. The results of the current study tend to show that the employment and military experiences of disabled veterans as well as their high school subject preferences have even less value for predicting scholastic achievement in specific college subjects than do their interest scores on the Kuder Preference Record.

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[1]Walter Van Dyke Bingham, Aptitudes and Aptitude Testing. New York: Harper and Brothers, 1937, p. 81.

[2]Edward B. Greene, Measurements of Human Behavior. New York: The Odyssey Press, 1941, p. 484.

CHAPTER VI

FINAL CONSIDERATIONS

This concluding chapter presents a summary of the research findings combined with certain significant conclusions. Certain implications are also included. Any interpretation of these research results should take into consideration the selective nature of the group studied and the depressive effect on coefficients of correlation of such stratification or restriction in the range of ability.

SUMMARY

1. High school grade-point averages and performance on the A C E Psychological Examination produced significant positive correlations with college grade-point averages in predicting college success for the entire group of subjects studied (Table XXIV).

2. High school grades and performance on the A C E Psychological Examination were weighted rather heavily as bases for permitting disabled veterans to enroll in an institution of higher learning under the provisions of the Rehabilitation Act.

3. In forecasting the scholastic success of the total group and using general scholarship as the criterion, coefficients of correlation for each of the quantitative variables were as follows: age, -.042; number of dependents, .045; percent of disability, .064; length of service, -.030; high school grade-point average, .290; A C E percentile rank, .263; and military rank at time of discharge from service, -.032 (Table XXIV).

4. Among the various disability groups, percentile ranks on the A C E and high school grade-point averages were the only indices which produced significant positive relationships with the criterion at the 1 percent and 5 percent levels of confidence.

5. In estimating the college success of disabled veterans within specific disability categories, the A C E Psychological Examination proved to have a higher degree of predictive efficiency than did high school grade-point averages.

6. The coefficients of correlation between the A C E percentile rank and total grade-point averages of veterans within the disability groups ranged from .109 for veterans with amputations and disabilities of the bones, muscles, tendons and joints to .517 for those subjects with respiratory and circulatory conditions and disabilities of the eye, ear, nose and throat.

7. Among the five disability groups, the coefficients of correlation between college achievement and high school grade-point averages ranged from .074 in the case of veterans with neuropsychiatric disabilities to .386 for those subjects discharged from the service because of skin conditions and communicable and infectious diseases.

8. The one instance in which a positive relationship was found to obtain between age and college scholastic achievement ($r = .186$), was in the case of those individuals whose disabilities involved the eye, ear, nose or throat, or respiratory and circulatory conditions (Table XXVIII).

9. No significant or consistent relationship was found between general scholarship and the following variables: military rank at time of discharge from service, length of military service, percent of disability, number of dependents, and age.

10. A very slight relationship was discovered between interest test scores and scholastic achievement of disabled veterans in specific college subjects. The highest coefficient of correlation obtained was .31 between musical interests as measured by the Kuder Preference Record and grades earned in college language courses (Table XLII).

11. The high school subjects preferred by these individuals apparently have little value in predicting success in specific college subjects. The coefficients

range from -.23 between success in college language courses and science to .23 between grades earned in college mathematics and a preference for these high school subjects (Table XLIII).

12. Low correlations were found between occupational experience and academic success in specific college subjects. The highest degree of positive relationship ($r = .21$) existed between employment experience and grades in college English (Table XLIV).

13. By combining certain predictive variables, coefficients of multiple correlation in the 40's and 50's were obtained between total grade-point averages and a combination of indices. The lowest coefficient of multiple correlation produced was .353 when high school grades and the A C E percentile rank for the entire group of subjects were combined. A combination of the A C E percentile rank, high school grade-point average, number of dependents, age, and percent of disability yielded a coefficient of multiple correlation of .594 with scholastic success of veterans having disabilities of the eye, ear, nose, throat or respiratory and circulatory difficulties (Tables XXXVI and XL).

CONCLUSIONS

1. Scores on the A C E Psychological Examination and high school grade-point averages appear to constitute

a fairly reliable basis for forecasting the college scholastic success of the 456 disabled veterans comprising this study.

2. The predictive efficiency of these variables depends somewhat upon the disabilities of the veterans being counseled. Apparently, performance on the A C E predicts college success (r = .517) much better among veterans with respiratory and circulatory conditions and disabilities of the eye, ear, nose and throat than in the case of veterans with amputations and disabilities of the bones, muscles, tendons and joints (r = .109).(Tables XXVIII and XXV respectively). Just why this should be true lies beyond the purview of this investigation.

3. The high school grade-point average appears to be most valuable in forecasting the academic success of veterans discharged from the service because of skin conditions and communicable infectious diseases (r = .386) and the least significant in the case of veterans with neuropsychiatric disabilities (r = .074).(Tables XXVI and XXVII).

4. Apparently there is no significant relationship between a disabled veteran's age and his chances for success in a college or university training program. The coefficients of correlation ranging from -.236 to .186 are too low to be considered significant at either the 1 percent or 5 percent level of confidence.

5. The disabled veteran's marital status and number of dependents seem to have little if any relation to his academic success in college. Among veterans with disabilities involving the eye, ear, nose, throat or respiratory and circulatory systems, there appears to be a slight tendency for married individuals with children to earn better grades in college than for single men. On the other hand, it seems that among those veterans discharged from the service because of skin conditions and infectious diseases, the single individuals tend to be superior with respect to college scholarship. The research results indicate, however, that these differences are not significant.

6. In predicting the academic success of these subjects, apparently little if any significance can be attached to such factors as the length of time the veteran was in the service or his military rank at the time of discharge. Throughout the study appears a slight negative relationship between college success and rank at time of discharge from service. This same tendency is found with respect to length of service, with the exception of those individuals whose disabilities concern the respiratory and circulatory organs or the eye, ear, nose and throat, wherein a slight positive relationship was found between the predictive variable and the criterion.

7. The vocational interest patterns of the individuals comprising this study fail to reveal any significant

relation to achievement in specific college subjects. In certain instances interest test scores correlate .29 and .31 respectively with the criterion while the highest coefficient of correlation between high school subject preferences and college success is .23. Apparently too much value should not be attached to interest patterns as indicators of the probable level of an individual's achievement in specific college subjects (Tables XLII and XLIII).

8. The results of this study indicate that employment or service experience has little value for estimating how well disabled veterans will perform in specific college subjects. The highest degree of relationship appears between grades in college English, and employment or service experience having occupational significance. In the first instance the correlation was .21 and in the latter case .15. Neither of these correlations, it may be seen, is sufficiently high to constitute a significant degree of relationship (Table XLIV).

9. The scholastic achievement of disabled veterans does not appear to be greatly affected by either the type or degree of severity of the veteran's disability. While some variations were found with respect to college grade-point averages among the disability groups, these differences were significant neither at the 1 percent or 5 percent

level of confidence. In some instances a tendency was found for individuals with a high percent of disability to earn high grades in college. Positive correlations ranging from .142 in the case of neuropsychiatric veterans to .270 for individuals with miscellaneous disabilities were revealed between percent of disability and success in college. Among subjects with infectious diseases and disabilities of the skin, a negative relationship was found ($r = -.120$).

10. When the predictive variables were combined by multiple correlation the size of the coefficient was increased. The inclusion of number of dependents, percent of disability and length of service in a predictive battery, otherwise composed of A C E percentile rank and high school grade-point average tended to produce a significant increase in the predictive accuracy of the battery. In combination these variables increased the coefficient of correlation from .517 to .594 as predictors of college success among veterans with eye, ear, nose, throat, respiratory or circulatory disabilities.

11. In light of the limitation imposed on the validity coefficient by the uncontrolled environmental and non-intellectual determinants of academic performance, such as the veteran's maturity, motivation and work habits, the accuracy of prediction is not surprisingly low.

IMPLICATIONS

The results of this study indicate that scores on the A C E Psychological Examination and certain factors in the individual's background would have been of significant value in predicting the scholastic success of the 456 disabled veterans with whom this study is concerned. The prognostic significance of these variables would have been much greater for predicting the probable achievement of groups of veterans having similar disabilities than for forecasting how well a specific individual might have been expected to perform scholastically in a college training program.

Certainly an analysis of the total picture in counseling a disabled veteran with respect to college training is of vital importance. In estimating a disabled veteran's chances for college success, personal factors and environmental and non-intellectual determinants of scholastic achievement must always be carefully considered along with the quantitative variables.

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