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THE PREDICTION OF SUCCESS OF STUDENTS ENROLLED

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CHAPTER I

THE PROBLEM: ITS BACKGROUND AND SCOPE

Introduction

In the American culture there has been much interest expressed through books,[1] periodicals,[2] foundation reports,[3] and professional education meetings[4] concerning the identification of scholastically talented students on the elementary, secondary, and college levels. Institutions of higher learning and the professional schools within these

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[1]David C. McClelland et al., Talent and Society (Princeton: D. Van Nostrand Company, Inc., 1958).

[2]Virgil S. Ward, "New Perspectives in the Education of the Gifted," Educational Forum, XXIV (March, 1960), 329-35.

[3]Edgar Stern Family Fund, Recognition of Excellence (Glencoe: The Free Press of Glencoe, Illinois, 1960).

[4]Invitational Conference on the Academically Talented Secondary School Pupil, The Academically Talent Student (Washington: National Education Association, 1958).

institutions are concerned about identifying the characteristics of scholastically talented students enrolled in their institutions and departments. It is of equal importance to be concerned with identifying the characteristics of students not classified as high in scholastic aptitude in order to make adequate comparisons.

Beginning in 1946 there was a sudden increase in the number of persons seeking admission to college.[1] From that time until the present the number of high school graduates of both sexes seeking admission to institutions of higher learning has gradually increased, and it is predicted that the college age group will increase in greater proportion than the total population, making discriminate selection and retention a major problem because of the intense competition.[2] If properly used, knowledge of the characteristics of college students with high-, medium-, and low-scholastic aptitude could serve as a partial basis in formulating policies relative to selection and retention.[3] Teacher education institutions

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[1]Helen E. Davis, On Getting Into College (Washington: American Council on Education, 1949).

[2]Educational Policies Commission, Higher Education in a Decade of Decision (Washington: National Education Association, 1957), pp. 28-36.

[3]Ruth A. Stout, "Selection of Teacher Education Students," The Education of Teachers: New Perspectives, Report of the Second Bowling Green Conference (Washington: National Commission on Teacher Education and Professional Standards, National Education Association, 1958), pp. 248-54.

and departments should recognize the necessity of setting and adhering to appropriate minimal standards in the selection and retention of prospective members of the profession.[1]

Before standards may be set, criteria of success must be determined. A basic assumption of any teacher education program is that the successful completion of the courses in its curriculum contribute to the preparation of the potential teacher and are essential for future success as a teacher. Two specific criteria of success in education courses are grades assigned by the instructors and scores on objective tests that measure the understanding of concepts related to the courses. These criteria may be appropriate for retention, but they are of no value in selection which is a problem of prediction.

Prediction of success is one of the purposes for which scholastic aptitude tests are administered. Assuming that the scholastic aptitude of matriculating freshmen can be measured accurately, the test results should be used as a partial basis for identifying the potentially talented students[2] planning to teach as a career. If both students

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[1]Jay E. Green, "The Selective Processes for Prospective Members of the Profession," The Professional Standards Movement in Teaching: Progress and Projection, Report of the Parkland Conference (Washington: National Commission on Teacher Education and Professional Standards, National Education Association, 1956), pp. 25-31.

[2]Lee J. Cronbach, Essentials of Psychological Testing (2nd ed.; New York: Harper and Brothers, 1960), pp. 18-19.

who are and who are not potentially capable of doing satisfactory work in professional education courses can be identified accurately, then a first step in the effective use of test results is to collect information in two broad areas for comparison purposes, such as: (1) differences before college entrance that might have affected the results of the scholastic aptitude test, and (2) differences in achievement after college entrance that might indicate the value of the test results as a partial basis for selection and retention in the professional education program. A second step is to determine the degree of effectiveness that scholastic aptitude and other selected independent variables have in predicting success in the professional education courses required of all students in a teacher education program. The criterion of success can be indicated best by scores on objective tests that measure the understanding of concepts related to the courses. Data of this nature should be collected and analyzed in order to develop criteria for more effective selection of students in a professional school, such as, the teacher education program at the University of Oklahoma.

Statement of the Problem

This study was concerned with the problem: Are scholastic aptitude and other selected independent variables effective in the prediction of success in the three sequential

professional education courses required for all students in the teacher education program at the University of Oklahoma?

The primary purpose of the study was the development of multiple regression equations for predicting success in the three sequential professional education courses: (1) The School in American Culture, (2) Human Growth and Development, and (3) Educational Evaluation and Guidance. Two ancillary purposes were to determine the differences of selected characteristics among college students used in the study and the relationship between success in the three courses mentioned above and selected characteristics. The study was divided into three parts to test these purposes.[1]

The first part of the study was to determine whether there were statistically significant differences among college students with high-, medium-, and low-scholastic aptitude who attended and graduated from Oklahoma public high schools and were enrolled during the fall semester of the 1960-1961 school year in one of the three sequential professional education courses at the University of Oklahoma. Selected characteristics were classified into four major areas: (1) mastery and achievement, (2) background information, (3) information related to teaching, and (4) information related to the Oklahoma public high school from

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[1]Part of the data reported herein was supplied by a grant from the United States Office of Education, Department of Health, Education, and Welfare.

which the subjects graduated. The first general hypothesis was established: that there are no statistically significant differences in characteristics among college students with high-, medium-, and low-scholastic aptitude. The first general hypothesis included eighteen specific null hypotheses. This descriptive part of the study involved the testing of the following null hypotheses:

H_{0_1} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to reading comprehension.

H_{0_2} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school English.

H_{0_3} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school mathematics.

H_{0_4} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school science.

H_{0_5} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school history.

H_{0_6} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to grade point average for the freshman year in college.

H_{0_7} There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to social class identification.

H_{0_8} There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to occupation of parent.

H_{0_9} There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the educational level of mother.

$H_{0_{10}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the educational level of father.

$H_{0_{11}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to college within the university to which assigned.

$H_{0_{12}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to major teaching field.

$H_{0_{13}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to whether working towards an elementary, secondary, or a combination 1-12 certificate.

$H_{0_{14}}$ There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to attitude towards teaching.

$H_{0_{15}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the size of their high school graduating class.

$H_{0_{16}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to whether or not their high school was accredited by the North Central Association of Colleges and Secondary Schools.

$H_{0_{17}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the proportion of their high school teachers having master's degrees.

$H_{0_{18}}$ There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to educational level of their high school principal.

The purpose of the second part of the study was to determine whether there were significant correlations between the independent variables, scholastic aptitude and other selected characteristics, and the dependent criterion, success in one of the three sequential professional education courses at the University of Oklahoma as measured by the scores on objective tests administered at the end of the 1960-1961 fall semester. The second general hypothesis was established: that there are no statistically significant correlations between the criterion, success in the professional education courses, and the independent variables, scholastic aptitude and other selected characteristics. The second general hypothesis included eight specific null hypotheses. This predictive part of the study involved the testing of the following null hypotheses:

$H_{0_{19}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and scholastic aptitude.

$H_{0_{20}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and reading comprehension.

$H_{0_{21}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and mastery in high school English.

$H_{0_{22}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and mastery in high school history.

$H_{0_{23}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and grade point average for the freshman year in college.

$H_{0_{24}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and verbal ability.

$H_{0_{25}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and attitude towards teaching.

$H_{0_{26}}$ There is no statistically significant correlation between the criterion, success in the professional education courses, and social class identification.

Operational Definitions

The operational definitions are listed in chronological order as they were first introduced in the statement of the problem:

1. Success.--The dependent variable in the prediction of success in the professional education course in which a subject was enrolled was measured by a concept mastery test that was based chiefly upon concepts that a student should understand in order to have mastery of the subject matter

taught in the course. For each of the three sequential professional education courses a test was constructed from concepts and administered during the last class session of the fall semester of the 1960-1961 school year. A subject was considered successful in a course if his score on the test was equal to or greater than one standard deviation below the mean.

2. Scholastic aptitude.--This factor was defined as the hypothetical potential in performance that indicates an individual's capacity to learn; it was measured by the Ohio State Psychological Examination, hereafter referred to as the OSPE, which was administered as a regular part of the testing program to all matriculating freshmen at the University of Oklahoma. For conveniences the decile categories were used to classify subjects into three scholastic aptitude groups defined as follows:

a. Subjects were classified as college students with high-scholastic aptitude if their OSPE total scores were in the upper three decile ranks.

b. Subjects were classified as college students with medium-scholastic aptitude if their OSPE total scores were in the middle two decile ranks.

c. Subjects were classified as college students with low-scholastic aptitude if their OSPE total scores were in the lower three decile ranks.

This provided one decile rank, the fourth and the seventh, between each scholastic aptitude group to allow for the standard error of measurement of the test.

3. Sequential professional education courses.--In the curriculum of the teacher education program at the University of Oklahoma the three sequential professional education courses that were a part of a required foundation program leading towards a teaching certificate in any field regardless of the level or the subject area were: (1) Education 52--The School in American Culture, (2) Education 151--Human Growth and Development, and (3) Education 222--Educational Evaluation and Guidance.

4. Reading comprehension.--This factor was measured by the Ohio State Psychological Examination which was administered as a regular part of the testing program to all matriculating freshmen at the University of Oklahoma. The scores which were recorded as decile ranks were converted to T scores in order to have comparable scores.

5. Mastery in high school subjects.--Mastery in high school English, mathematics, science, and history was measured in decile ranks by the Iowa High School Content Examination which was administered as a regular part of the testing program to all matriculating freshmen at the University of Oklahoma; scores indicated the degree of retention of content learned in high school. These decile ranks were converted to T scores in order to have comparable scores.

6. Grade point average.--A form of achievement is the grade point average for the freshman year in college as calculated at the University of Oklahoma. The number of grade points was calculated as follows: each semester hour of work for which a grade of A was received was counted as four points; B, three points; C, two points; D, one point; and E or F, zero points. The total grade points were divided by the number of semester hours carried to obtain the grade point average. This average was based on the first two semesters that the subjects were enrolled at the University of Oklahoma.

7. Social class identification.--Subjects were classified with a numerical rating of one through forty-two based on an index of social class with which a person unconsciously identifies himself by the occupational group with which he associates. The instrument designed for such a purpose is the Sims Social Identification (SCI) Occupational Rating Scale. This scale was administered during the first week of the fall semester of the 1960-1961 school year.

8. Occupation of parent.--The occupation of the parent was classified according to the Dictionary of Occupational Titles[1] into seven categories: (1) Professional and managerial occupations, (2) Clerical and sales occupations, (3) Service occupations, (4) Agriculture, fishery, forestry,

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[1]U. S. Department of Labor, Dictionary of Occupational Titles, Volume 1, Definition of Titles (2nd ed.; Washington: U. S. Government Printing Office, 1949).

and kindred occupations, (5) Skilled occupations, (6) Semi-skilled occupations, and (7) Unskilled occupations.

9. Educational level of parents.--The educational level of each parent was classified into five categories based upon: (1) less than high school graduates, (2) high school graduates, (3) some college, (4) college graduate, and (5) postgraduate work.

10. College.--The University of Oklahoma is composed of several colleges to which students are assigned depending upon the degree and major. Subjects of this study were assigned to four colleges: (1) Arts and Science, (2) Education, (3) Fine Arts, and (4) University College.

11. Major teaching field.--This variable was classified into fourteen categories: (1) art, (2) business education, (3) elementary, (4) foreign language, (5) home economics, (6) industrial arts, (7) language arts, (8) mathematics, (9) music, (10) physical education, (11) science, (12) social studies, (13) special education, and (14) speech.

12. Certification level.--This variable was based on whether a subject was enrolled in a teacher education program that would lead to an elementary or a secondary certificate approved by the State Board of Education of the State of Oklahoma. A third category was for subjects working towards a teaching certificate valid in grades 1-12.

13. Attitude towards teaching.--This factor was defined as the prediction of how well a person will get along with pupils as a teacher; it was measured by the Minnesota Teacher Attitude Inventory, Form A, which was administered during the first week of the fall semester of the 1960-1961 school year. Percentile ranks from norms for beginning education students published by the authors were converted to T scores in order to have comparable scores.

14. Educational level of principal.--Principals of Oklahoma high schools from which the subjects graduated were classified into three categories for the purpose of this study according to the highest college degree they had earned at the time of the subjects' graduation. Information was acquired from the official records of the State Department of Education of the State of Oklahoma.

Limitations of the Study

1. The scope of the study did not take into consideration such factors as race, undergraduate classification, values, birth rank, size of family, family incomes, interests, motivation, work load, personality, emotional stability, military service, membership in fraternity or sorority, church membership, and high school grades.

2. The scope of the study did not take into consideration such factors as teaching methods, ability and personality of high school or college teachers, school

organization and curriculum, and courses taken by subjects in high school or college.

3. The validity of the study was dependent upon the reliability and validity of the instruments used to measure understanding of concepts, scholastic aptitude, verbal ability, mastery of high school content, social class identification, and attitude towards teaching.

4. The value of the study was limited to the accuracy of the grouping by decile ranks on the Ohio State Psychological Examination and the Iowa High School Content Examination. The study would have been more valuable if raw scores or percentile ranks had been available.

5. The sample was limited to a select sample of college students enrolled in one of three sequential professional education courses at the University of Oklahoma during the fall semester of the 1960-1961 school year. The subjects must have matriculated at the University of Oklahoma as freshmen from an Oklahoma high school.

6. The prediction of success was limited only to the three sequential professional education courses at the University of Oklahoma and application of the findings of this study is recommended for prediction only with a similar population. It will not predict success in the classroom as a teacher.

CHAPTER II

REVIEW OF SELECTED RESEARCH STUDIES

A review of studies related to the problem indicated there was a large number of studies concerning the characteristics of students and the prediction of scholastic success of students in general. Nineteen studies were selected for detailed review because they were most directly related to this study in such matters as criterion, independent variables, instruments, population, and treatment of data.

A study that has probably had the greatest influence in getting teacher education institutions to initiate a program of selective admission and retention was done by Stout. The purpose of the study was to determine whether a relation existed between selective admissions and retention practices and the following factors: geographical location, type of support and administrative control, type of organization and structure, type of baccalaureate-degree teacher education program, size of regular undergraduate enrollment, and size of enrollment in teacher education. Responses were received in answer to questionnaires from 91 per cent or 785

of the 865 accredited four-year institutions that prepare teachers in the United States and the Territories for the 1952-1953 school year. Responding institutions were classified into three groups and comparisons drawn between the most and the least selective programs using Chi-square to test them. There was a significant difference between high and low groups in their production rates; production rates were measured by the percentage of initially admitted students who graduated and graduates who entered at once into teaching.

The respondents selected the following five criteria out of nine choices as the most important for selection: emotional stability ranked first; moral and ethical fitness and general intelligence tied for second; and third and fourth positions were demonstrated ability to work with children and professional interest and motivation. Opinions on the next steps in establishing selective admission for programs of teacher education and their percentage were: consideration of evidence in addition to grades and rank in class, 61.8 per cent; provision for better vocational guidance and counseling for high school students, 59.4 per cent; extension of recruitment and orientation programs, 57.4 per cent; establishment of specific criteria for periodic review of students' progress, 52.1 per cent; use of more nearly objective measures of personality, 38.6 per cent; use of a greater number of persons to pass on admissions, retention,

and recommendation of the prospective teacher, 32.9 per cent; and requirement of a higher grade average than that for admission to the parent institution, 18.7 per cent. Two-fifths of responding institutions admitted all who sought admission; three-fifths excluded some, but most of them excluded only one to ten per cent. The five criteria used to indicate selective admission practices were: relation of teacher education admission to the parent institution admission, use of faculty committee, use of the interview, regulations for continuance announced at initial admission, and exclusion rates; the six criteria used to indicate selective retention practices were: use of supply-demand data in connection with students' interests and abilities, periodic review by faculty committee, interview at review periods, rates of exclusion from student teaching, rates of counseled or dropped out, and the bases for certifying candidates.

The results of the study indicated that there was a relationship between selective admission and retention practices in teacher education and such institutional characteristics as geographical location, type, and size; and that selectivity was most apt to be found if programs were devoted primarily to the preparation of elementary school teachers in a large municipal or state institution in the area of the Western Colleges Association.[1]

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[1]Ruth A. Stout, "Selective Admissions and Retention Practices in Teacher Education," Journal of Teacher Education, VIII (September and December, 1957), 299-317 and 422-32.

The characteristics of students in the beginning sequence of secondary education curriculum in the fall quarter of the 1958-1959 school year were studied by Statler by use of the questionnaire technique at Ohio State University. Information reported that was relative to this study was concerning the family background of students of education. The most frequently reported occupations of the fathers of students and the per cent so employed were: businessmen--33.4 per cent, production worker--13.2 per cent, and agriculturist--12.8 per cent. The average family income and the percentages in each group were: 12.8 per cent, under $4,000; 13.2 per cent, between $4,000 and $5,000; 23.7 per cent, between $5,000 and $7,500; 24.2 per cent, between $7,500 and $10,000; 16 per cent, between $10,000 and $20,000; and 10.1 per cent, over $20,000. Mothers tended to have somewhat more schooling than fathers; parents of women students tended to have higher educational levels. The percentages for three sizes of high school graduating classes were as follows: over five per cent had fewer than twenty-five, over fifty-six per cent had 150 or fewer, and only twenty-seven per cent had three hundred or more.[1]

Theide investigated some of the characteristics of

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[1]Ellsworth S. Statler, "Characteristics of Students in a Teacher-Education Course," Educational Research Bulletin, XXXVIII (September 9, 1959), 151-58+.

students in teacher education as compared to students in other selected curricula at the University of Wisconsin with reference to academic aptitude and achievement in high school and college prior to the junior year. In order to control variables of students' interests and departmental grading practices, students were grouped into the following categories: working for a Bachelors of Arts degree, pre-medicine, working for a Bachelors of Science in Education degree, electrical engineering, home economics, in the School of Commerce, and students working for a teaching certificate along with a degree in another college. In order to be selected, subjects had to be juniors in the first semester of the 1948-1949 school year. Multiple regression equations and multiple correlation coefficients were computed using three independent variables separately for 287 men and 233 women. Scholastic aptitude was measured by the ACE Psychological Examination. College achievement was measured in the following combinations: all courses, all non-professional courses, all English and speech courses, all foreign language courses, all science courses, and all history and social studies courses.

Women scored nine percentile points higher than men on high school rank and four percentile points lower on the psychological examination, a significant difference at the .01 and .05 level, respectively. There was no significant difference between college grade point averages. Women working

for a Bachelors of Science in Education and in the teaching certification group tended to be superior to women in home economics. Men in the teacher certification group tended to be inferior to other groups.[1]

A study was done by Northern to determine whether the teaching profession was getting a high proportion of capable college students by comparing intelligence, sex, and achievement in college and high school of members of the graduating class at the University of Arkansas who planned and did not plan to teach. The sample was comprised of 247 men and sixty-five women, making a total of 312 students. The students were also classified into the following curriculum groups: teacher, agriculture, engineering, business, arts, and science. Factors compared were scores on the ACE Psychological Examination, scores on the Barrett-Ryan-Schrammel English Test, cumulative high school grade point averages, and yearly and cumulative college grade point averages.

Women students were significantly superior to men on the English test and in high school achievement when tested by the critical ratio technique. Analysis of variance was used to test the curricular groups divided by sexes with respect to ACE scores, B-R-S English scores, high school

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[1]Wilson Bickford Theide, "Some Characteristics of Juniors Enrolled in Selected Curricula at the University of Wisconsin," Journal of Experimental Education, XIX (September, 1950), 1-62.

marks, and cumulative college grade point averages. All the factors were significantly different for men. The "t" tests for differences in means on the ACE indicated that students in business, arts, science, and engineering were significantly superior to students in teaching; on high school grade point averages students in science, business, and arts were significantly superior to students in teaching; and on cumulative college grade point averages only arts and science students were significantly superior to men students in teaching.

Comparison of women was limited to business, arts, agriculture, and teaching because there were only three women in the science group and none in the engineering group. Analysis of variance indicated significant differences, so "t" tests between means were employed. The only group significantly superior to the students in teaching was the arts group on the ACE test. None of the other factors was significant.[1]

In comparing 776 graduates at California State College at San Diego in 1939 of the liberal arts curriculum and the teacher education curriculum, Ault found that their means of grade points on a -1 to a +3 scale were 1.63 and 1.66, respectively. The difference was not significant. On the ACE Psychological Examination the means of the decile ranks

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[1]E. F. Northern, "How Well Do Prospective Teachers Compare with Students Preparing to Enter Other Occupations?" Journal of Teacher Education, IX (December, 1958), 387-94.

were 7.29 and 6.61 in favor of the liberal arts group. The difference was not significant. The decile ranks were based on national norms, making both groups superior.

The students in the teacher education curriculum when compared as to the type of teaching credential receiving were found to have the following aptitude decile means and grade point averages: elementary, 6.83 and 1.66; junior high school, 6.95 and 1.68; art special, 6.20 and 1.82; commercial special, 6.76 and 1.77; music special, 6.70 and 1.73; and physical education special, 5.27 and 1.51. The differences within teaching credential groups were greater than between liberal arts and teacher education curricula.[1]

An attempt to determine the relationship between accredited level of the high school and the ability of its graduates to do college work at Arkansas State College was made by Keister. High schools were classified into three categories: Arkansas Class A high schools in North Central Association, Arkansas Class A high schools not in North Central Association, and Arkansas Class B and Class C high schools which are not eligible for membership in the North Central Association. Grade point averages for four years of high school and the fall semester of college were computed. Intelligence quotients were measured by the Otis Quick Scoring

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[1]J. W. Ault, "Selection as a Factor in Teacher-Education," School and Society, LII (October 5, 1940), 309-12.

Test of Mental Ability. These data were collected for two groups of freshmen enrollees who completed the fall semesters of 1950 and 1953.

Results of the study showed there were no significant differences between groups paired on the basis of the year of admission to college except for a 3.6 drop in mean IQ of the North Central graduates from 1950 to 1953, which was significant at the one per cent level of confidence. There was a significant difference at the one per cent level in mean difference between high school and college grade point averages for all groups, grades being higher in high school than in college.

The coefficients of correlation between high school and college grade point averages for the three groups of high school graduates respectively were .70, .58, and .60 for the 1950 and .68, .61, and .62 for the 1953 enrollees. This indicated a higher reliability between North Central high schools and college in the area of grading. North Central graduates were consistently superior to the two other groups, more so in 1950 than in 1953. In some cases during 1950 the differences were significant at the one per cent level. College grade point averages for the North Central group during 1953 were superior in every case but not significantly. However, differences in high school marks tended to be in

favor of graduates of high schools accredited lower.[1]

High schools in Wyoming are divided into three classes based on qualifications and salaries of teachers, type of buildings, adequacy of laboratories and libraries, and other criteria. Students who entered the University of Wyoming as freshmen in 1941 and 1944 from Wyoming high schools with approximately equivalent ability as determined by the Ohio State Psychological Examination were compared as to persistence, grade averages, and honors received. For the purposes of the study students from second and third class high schools were combined. In order to increase controls, students were matched as to size and character of the community from which their schools were located.

It was concluded that students from schools with poorly paid teachers, meager libraries and laboratories, inferior buildings, and unsatisfactory textbooks leave college sooner. However, there was little difference between the groups in grade averages and college honors.[2]

The purpose of a study by Lathrop was to ascertain if

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[1]Baird V. Keister, "Relation Between High School Accreditation and Success in College," College and University, XXX (April, 1955), 284-88.

[2]Harriet Knight Orr, "A Comparison of the Records Made in College by Students from Fully Accredited High Schools with Those of Students Having Equivalent Ability, from Second and Third Class High Schools," Journal of Educational Research, XLII (January, 1949), 353-64.

the students from large and small high schools have the same survival-attrition ratio and achieve as well scholastically, and whether the various course patterns available in high school prepare students equally well for entrance to Iowa State College. The population studied was 1,516 non-transfer freshmen of 1952 from Iowa public high schools. High schools were grouped into ten categories, ranging from less than twenty-five students to more than a thousand. Course patterns were divided into four classifications: mathematics-science; college preparatory; vocational; and miscellaneous. The technique employed was analysis of covariance; control variables were high school size, ACE Psychological Examination scores, and high school grade point average. Four criteria employed were: survival-attrition tendency at the end of the first quarter of college; graduation-attrition tendency at the end of five year period; and quality point average at the end of first quarter and five year period. The percentage of survival at the end of the first quarter was 91.3 per cent; graduates after five year period were 44.9 per cent of the original 1,516 freshmen. The biserial correlation between survival-attrition tendency and quality point average was .325 which was significantly different from zero; biserial correlation between graduation-attrition tendency and cumulative quality point average at the end of the five year

period was .372.[1]

Swensen found that a sample of three hundred students admitted as freshmen to the Undergraduate College of Arts and Science at the University of Pittsburg in the years 1946-1948 and graduating in the upper two-fifths of their high school class did significantly better at the .01 level of confidence than students in the lower three-fifths in grade point average, their first semester in college. Students were matched as to scores on the ACE Psychological Examination, sex, high school from which graduated, year of high school graduation, and courses taken in college. There was no significant difference between the lower two-fifths and the middle fifth.

Correlation coefficients between the ACE scores and grade point averages for the three groups were .32, .22, and .06 respectively. The first r was significant at the .01 level and the second r at the .05 level. Groups were further compared as to the number of successful students, that is, students who obtained a 1.00 or C average for the first two semesters at college. The upper group had significantly more students who achieved a 1.00 or C average grade point, but there was a lack of difference between middle and lower

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[1]Irvin T. Lathrop, "Scholastic Achievement at Iowa State College Associated with High School Size and Course Pattern," Journal of Experimental Education, XXIX (September, 1960), 37-48.

groups. It was concluded for a given aptitude score a student from the upper two-fifths of his high school class was more likely to achieve a C grade point average for the first two semesters of college than the lower three-fifths.[1]

The relationship of persistence and grades received the first semester of college and scores on a scholastic aptitude test by students at the University of Toledo who entered in the fall of the 1948-1949 school year was studied by Munger and Goeckerman. Students were classified into two groups, upper- and lower-third of their high school graduating class. There were 242 in the upper group and 187 in the lower group. The subjects were further divided into nine categories of persistence, dependent upon the number of semesters completed or graduation.

Scholastic aptitude was measured by the Ohio State Psychological Examination, Form 20. Analysis of variance of the mean gross scores failed to reveal significant differences in the persistence groups in either the upper-third or the lower-third groups. There was a significant difference on "t" tests between the means of the lower-group and the means of the upper-group on the OSPE at the one per cent level of confidence. This indicated that the difference between OSPE scores were not due to chance.

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[1]Clifford H. Swensen, Jr., "College Performance of Students with High and Low High School Grades when Academic Aptitude is Controlled," Journal of Educational Research, L (April, 1957), 597-603.

There was a definite line of progression or trend from persistence of one semester to a persistence of graduating in both lower- and upper-groups. The analysis of variance of the grade point averages for persistence groups resulted in F ratio values of 5.40 and 8.39 for the lower- and upper-groups, respectively. Both were significant at the one per cent level. Through "t" tests it was found that significant differences existed between means of students who finished only one semester and the group that graduated. It was also found that there was a significant difference between total mean grade point averages of upper- and lower-groups. The study seemed to indicate that grade point averages the first semester of college would be a better predictor of persistence than OSPE scores.[1]

The hypothesis of a study by Washburne in 1958 was that academic performance was positively correlated with socio-economic status of families of college students and the degree of urbanism of the community in which they lived. The samples were two groups of male freshmen, one from a state-supported institution in a Southwest town of 7,000 population and the other from a private institution in a major Northeast metropolis. Academic performance was measured by the mean of the grade point averages earned by a student during his

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[1]Paul F. Munger and Robert W. Goeckerman, "Collegiate Persistence of Upper- and Lower-Third High School Graduates," Journal of Counselling Psychology, II (Summer, 1955), 142-45.

first two semesters in college, ranging from zero to four points. Socio-economic status was based on educational level of both parents and the prestige of the occupation of the parent. The degree of urbanism was a weighted mean of each place of residence based on the size of the community and the nearness of it to metropolitan areas of various sizes. The theory of urbanism was that there is a relationship between size of community and its proximity to metropolitan areas and the cultural milieu in which children grow up.

Results of the analysis of the data indicated that socio-economic status of the family had nothing to do with academic performance as revealed by r's of -.05 and -.06 for the samples from the Southwest and the Northeast, respectively. Coefficients of total correlation of urbanism scores with mean semester grade point averages were .31 and .18. The correlation of .31 for the Southwest was significant, but the correlation of .18 was not significant at the .05 level. However, when the sample from the Northeast was divided into two groups, low and high urbanism, the correlation was .37 between grades and urbanism which was significant.[1]

Robertson and Harrison determined the correlation between reading skill as measured by scores on the Diagnostic

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[1]Norman F. Washburne, "Socioeconomic Status, Urbanism and Academic Performance in College," Journal of Educational Research, LIII (December, 1959), 130-37.

Reading Test and first semester grade point averages of 152 freshmen students at the University of Mississippi. Grades in physical education and ROTC courses were not included because of their non-academic nature. Grades correlated .26 with reading rate, .46 with vocabulary, .28 with comprehension excluding vocabulary, and .43 with comprehension including vocabulary. Only vocabulary and comprehension including vocabulary showed substantial correlation with grades. The standard error of these two correlations were .98 and 1.03, respectively. About two-thirds of the groups' predicted grade point averages would be expected to fall within one letter grade of the actual grade point average.[1]

Intercorrelations and multiple correlations were computed by Klugh and Bierley with grade point averages at the end of the first semester of college as the criterion and the total converted scores on the Cooperative School and College Ability Tests, Form 1C, and high school grade point averages as the predictor variables for men and women during the 1956-1957 school year at Alma College. Correlations between criterion and test scores ranged from .51 to .67; correlations between criterion and high school grade point averages ranged from .53 to .68; and multiple correlations ranged from .661 to .782. F ratios indicated a significant

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[1]Malcolm H. Robertson and Mildred M. Harrison, "Reading Skill as a Predictor of College Achievement," Journal of Educational Research, LIII (March, 1960), 258-62.

difference between multiple correlation and the single correlation for the criterion and SCAT scores at the .01 level.[1]

Admission data was gathered from freshmen entering Millerville State Teachers College in September, 1952. Data consisted of three admission criteria: scores on the ACE Psychological Examination, the Ohio State Psychological Examination, and high school rank in semi-deciles. Correlations with the quality point averages earned by the subjects at the end of their freshman year and the following criteria were: an r of .53 with percentile rank on ACE for 149 cases; an r of .60 with percentile rank on OSPE for 149 cases; an r of .49 with percentile rank on combined ACE and OSPE with 176 cases; and an r of .49 with high school rank with 139 cases. Multiple correlation between quality point averages and the combined influence of the ACE and the OSPE yielded an r of .63.[2]

In a predictive study of the criterion, first semester grade averages of 332 out of 564 members of the freshman class at Hofstra College, the combining of one variable at

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[1]Henry E. Klugh and Robert Bierley, "The School and College Ability Test and High School Grades as Predictors of College Achievement," Educational and Psychological Measurement, XIX (Winter, 1959), 625-26.

[2]Lee E. Boyer and James E. Koken, "Admission Test as Criteria for Success in College," Journal of Educational Research, L (December, 1956), 313-14.

a time yielded the following corrected multiple correlations: high school grade average in per cent, .590; Cooperative Reading Test, .712; New York State Regents Examination, .731; Cooperative Effectiveness of Expression score, .738; ACE Psychological Examination, .739; and New York State Regents English Examination, .737. Since the last two variables made little additional contribution, they were dropped.[1]

When using grades earned during the first semester of the freshman year as the criterion of academic success and scores on the separate parts of the Iowa High School Content Examination as independent variables, Butsch found multiple correlations ranging from .443 to .467 for students in the College of Business Administration, from .569 to .613 for the College of Engineering, from .439 to .523 for the College of Journalism, and from .481 to .511 for the College of Liberal Arts at the University of Wisconsin for 1934-1937. The correlations of grades earned and the Thurstone Psychological Examination for these same groups were from .469 to .489, from .516 to .528, from .462 to .526, and from .525 to .535, respectively. The psychological examinations in the College of Business Administration and the IHSC Examination in the Colleges of Journalism, Engineering, and Liberal Arts were the best measures, based on the percentage

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[1]Harold L. Henderson and Sherman H. Masten, "Six Predictors of College Achievement," Journal of Genetic Psychology, XCIV (March, 1959), 143-46.

they contributed to the prediction of grades for each college.[1]

Nebraska State Teachers College participated in the 1939 testing program of the Teachers College Personnel Association with its 321 entering students. Instruments used were college aptitude, elementary achievement, personal data, English, personality inventory, and music tests. About one-half of the subjects were in teacher education. Grade point averages were computed for the first semester. Zero order correlations computed among the seven variables ranged from -.157 to .848. The highest correlation was between the intelligence and the English tests.

For men it was found that college grades can be predicted best by the English test and the elementary achievement test which had correlations of .511 and .465, respectively; for women the best predictors were elementary achievement with .512, intelligence with .509, English with .506, and personal data with .378; and for the total group the best predictors were English and the elementary achievement tests with .508 and .496, respectively. Factor analysis indicated that the English and the elementary achievement tests had enough factors in common with college freshman grades that they were good tests for scholastic prediction.

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[1]R. L. C. Butsch, "Improving the Prediction of Academic Success through Differential Weighting," Journal of Educational Psychology, XXX (September, 1939), 401-20.

Their accuracy in predicting was such that no student would be displaced more than two letter grades and approximately forty-three per cent would be forecasted within one letter grade.[1]

Lien made a comparison and a predictive study of two hundred students classified as freshmen or sophomores during the school years of 1948-1949, 1949-1950, and 1950-1951, at Whitewater State Teachers College, Whitewater, Wisconsin. The subjects were equally divided in four teacher training curricula: rural, elementary, secondary academic, and secondary commercial. The purpose of the investigation was a starting point for differential selection, prediction, and guidance of students in teacher education. The study determined the likenesses and differences of the four groups and the relationship of characteristics and success as measured by honor-point ratio in courses in the student's area of specialization taken during the freshman year. Likenesses and differences were tested by finding the critical ratios between means and percentages; relationships were tested by finding product-moment correlation coefficients, multiple correlation coefficients, and regression equations. Data gathering devices used were: College Application Blank, Personal Data Blank, ACE Psychological Examination, Cooperative

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[1]Glenn W. Durflinger, "Scholastic Prediction in a Teachers College," Journal of Experimental Education, XI (June, 1943), 257-67.

English Achievement Test, California Interest Inventory, California Test of Personality, and the Registrar's Records.

The study isolated characteristics that are common to one group only, to two groups only, and to three curricula groups. Of two hundred different characteristics, ninety-three or 46 per cent revealed significant differences between students in different curricula groups. The zero order correlations ranged from -.282 to .778; the best correlations of a variable with the criterion for the various groups were: elementary--Regent's Selection Formula, .778; combined groups--Regent's Selection Formula, .627; commercial--Cooperative English Test, .625; academic--Regent's Selection Formula, .613; and rural group--Regent's Selection Formula, .553. The Regent's Selection Formula was computed by multiplying high school percentile rank by two, adding percentile rank in high school on the Henmon-Nelson Test of Mental Ability, and dividing by three. A score of thirty is required for admission to a state college.

The size of the multiple correlation as a result of combining the four best predictors for each group were: elementary, .864; rural, .731; commercial, .714; combined, .695; and academic, .690. Regression equations calculated from multiple correlations produced a forecasting efficiency of 50 per cent for elementary, 28 per cent for academic, 32 per cent for rural, 30 per cent for commercial, and 28 per cent for combined, indicating that it was more efficient

to predict success in each curriculum separately.[1]

An investigation by Carlile sought to determine the relationship between grades in student teaching and scores on selected measures in the following areas: (1) intelligence, (2) teaching aptitude, (3) scholastic achievement, (4) proficiency in the basic skills, and (5) personality traits. Coefficients of correlation between student teaching grades and the following twenty-three criteria were as follows: college grade points, .46; Iowa Every Pupil Tests, reading comprehension, .33; Detroit Advanced Intelligence Test, .28; Columbia Research Bureau English Test, .26; Henmon-Nelson Tests of Mental Ability for College Students, .23; Iowa Every Pupil Tests of Basic Skills, reading vocabulary, .22; faculty estimates, .21; Bernreuter Personality Inventory, dominance-submission, .17; Columbia Research Bureau American History Test, .14; Cox-Orlean Prognosis of Teaching Ability, .13; Ohio State Psychological Exam, .12; Columbia Research Civics and Government Test, .11; Iowa Every Pupil Tests of Basic Skills, language, .11; Bell Adjustment Inventory, emotional stability, .09; Bernreuter Personality Inventory, social adjustment, .04; Bernreuter Personality Inventory, home adjustment, -.03; Iowa Every

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[1]Arnold Juel Lein, "A Comparative-Predictive Study of Students in the Four Curricula of a Teacher Education Institution," Journal of Experimental Education, XXI (December, 1952), 81-219.

Pupil Tests of Basic Skills, work study, .02; Iowa Every Pupil Tests of Basic Skills, arithmetic, .01; Bernreuter Personality Inventory, self-sufficiency, .01; and Bell Adjustment Inventory, health adjustment, .01. Since all the correlations were low, the efficiency of each measure in predicting grades in teaching was low.[1]

In general these studies indicated the following: there was a need for criteria in admission and retention; there was a positive relationship between freshman grades and persistency in college; psychological examinations and aptitude tests were good predictors of grades in college; and effectiveness in the prediction of grades in college was increased by the use of multiple factors.

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[1]A. B. Carlile, "Predicting Performance in the Teaching Profession," Journal of Educational Research, XLVII (May, 1954), 641-68.

CHAPTER III

PROCEDURE OF THE STUDY

The Sample

This study was designed to determine the effectiveness of scholastic aptitude and other selected variables in the prediction of success of a select sample of students enrolled in the three sequential professional education courses of the teacher education program at the University of Oklahoma. Subjects were selected from 632 students enrolled in six sections of Education 52--The School in American Culture, six sections of Education 151--Human Growth and Development, and four sections of Education 222--Educational Evaluation and Guidance during the fall semester of the 1960-1961 school year. Attempts at randomization of students in these sixteen sections was accomplished by the processes through which samples of students register for the various sequential professional education courses. The names of the professors were not listed on the class schedule and only the normal forces such as appear during ordinary registration resulted in typical samples from the student population. The

students were not influenced by their advisors or persons in charge of registration. The subjects selected from the 632 students in these sixteen sections of the sequential professional education courses represented a select sample.

Selection of Subjects

Subjects were selected for the study if they met the following conditions used as controls:

1. Only subjects classified as undergraduates.

2. Only subjects who attended and graduated from an Oklahoma public high school.

3. Only subjects who matriculated at the University of Oklahoma as freshmen.

4. Only subjects less than twenty-five years of age at the beginning of the fall semester of 1960-1961.

5. Only subjects with no previous classroom teaching experience.

6. Only subjects for whom complete data were available.

7. Only subjects working for a certificate in the teacher education program and planning a career in teaching.

8. Subjects enrolled in more than one sequential course during the semester were randomly assigned to only one course to prevent duplication.

Table 1 shows a complete analysis of the number eliminated and the bases for elimination.

TABLE 1

SUBJECTS INELIGIBLE FOR SELECTION

Reasons for Elimination	Eliminated	
	Number*	Per Cent
Other than undergraduate	23	3.6
Attended an out-of-state high school	180	28.4
Attended a private high school in Oklahoma	9	1.4
Transfer student	245	38.7
Twenty-five years of age or older	50	7.9
Had previous classroom teaching experience	13	2.0
Taking course because of pre-nursing requirement	15	2.3
Taking course for general education credit	27	4.2
Enrolled in more than one foundation course during the semester	19	3.0
Incomplete data on subject	2	.3

*Number eliminated not additive since some subjects eliminated did not meet more than one requirement.

Also, the subjects had to meet one additional criterion which was essential for the first part of the study, that is, their total scores on the Ohio State Psychological Examination had to fall in one of the ranges for the three scholastic aptitude groups. The upper-scholastic aptitude group consisted of subjects with scores in the upper three decile ranks; the medium-scholastic aptitude group consisted of subjects with scores in the middle two decile ranks; and the low-scholastic aptitude group consisted of students in the lower three decile ranks. Consequently, the fourth and the seventh decile ranks were not included in the study of the characteristics among groups in order to account for the standard error of measurement of the test. All ten decile ranks were included in the second and the third parts of the study, the relationships and the prediction of success.

Table 2 shows a complete analysis of the number of subjects for the three parts of the study who scored in each decile rank in each course. The sample selected for use in the study consisted of 198 subjects for the first part and 245 subjects for the second and third parts of the study. The subjects graduated from ninety-six Oklahoma public high schools.

The Chi-square test was used to determine whether the sample selected for the study represented a normal distribution of test scores of the students enrolled at the University of Oklahoma. The test was to determine if there was a significant

TABLE 2

DISTRIBUTION OF SELECTED SUBJECTS FOR PURPOSES OF COMPARISON OF CHARACTERISTICS AND PREDICTION OF SUCCESS

Decile Rank	Courses			Decile Totals	Group Totals
	Ed. 52	Ed. 151	Ed. 222		
0	6	4	7	17	
9	6	5	7	18	57 (Upper)
8	10	8	4	22	
7	10	8	9	27	
6	15	7	9	31	
5	15	6	14	35	66 (Medium)
4	10	5	5	20	
3	14	6	8	28	
2	15	7	8	30	75 (Low)
1	12	1	4	17	
Total	113	57	75	245	198

difference in frequency distribution of decile ranks on the OSPE total score of the selected sample and an expected frequency for each cell of ten per cent of 245 or twenty-five. The obtained Chi-square was 15.40 and the required value for significance at the .05 level was 16.92 as presented in Table 3. The disproportionately high number of low decile students and a correspondingly low number of high decile students is similar to the 1952 freshman class at the University of Oklahoma. Fourteen per cent of the freshman class of 1952 ranked in the lowest decile.[1]

Another Chi-square test was also used to determine if there was any significant difference in frequency distribution of the sample on the OSPE total score in decile ranks and an expected frequency based on the same percentages in each decile rank of the 1952 freshman class. The expected frequencies were calculated by multiplying the percentage of each decile rank of the 1952 freshman class by 245, the total sample of this study. The obtained Chi-square value was 15.11 and the required value for significance was 16.92 at the .05 level of confidence, as presented in Table 4.

Instruments of Measure

Measuring instruments were utilized to determine

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[1]A Longitudinal Descriptive and Predictive Study of the Freshman Class of 1952, "First-Semester Grades and Test Scores of 348 Successful Students," Issue IX (Norman: University of Oklahoma Guidance Service), p. 11c.

TABLE 3

A CHI-SQUARE TO TEST IF THERE IS A SIGNIFICANT DIFFERENCE IN THE FREQUENCY DISTRIBUTION OF DECILE RANKS AND THE EXPECTED FREQUENCY OF TEN PER CENT IN EACH CELL ON THE OSPE

Decile Rank	f_o	f_e	$f_o - f_e$	$(f_o - f_e)^2$	$\frac{(f_o - f_e)^2}{f_e}$
0	17	25	- 8	64	2.560
9	18	25	- 7	49	1.960
8	22	25	- 3	9	.360
7	27	25	2	4	.160
6	31	25	6	36	1.440
5	35	25	10	100	4.000
4	20	25	- 5	25	1.000
3	28	25	3	9	.360
2	30	25	5	25	1.000
1	17	25	- 8	64	2.560
Total	245	250			$\chi^2 = 15.400$

TABLE 4

A CHI-SQUARE TO TEST IF THERE IS A SIGNIFICANT DIFFERENCE IN THE DISTRIBUTION OF DECILE RANKS ON THE OSPE AND THE EXPECTED FREQUENCY BASED ON PERCENTAGES OF THE 1952 FRESHMAN CLASS

Decile Rank	f_o	f_e	$f_o - f_e$	$(f_e - f_o)^2$	$\frac{(f_o - f_e)^2}{f_e}$
0	17	13	4	16	1.230
9	18	18	0	0	.000
8	22	21	1	1	.047
7	27	21	6	36	1.714
6	31	26	5	25	.961
5	35	31	4	16	.516
4	20	26	- 6	36	1.385
3	28	28	0	0	.000
2	30	30	0	0	.000
1	17	35	-18	324	9.257
Total	245	249			$\chi^2 = 15.110$

scholastic aptitude, reading comprehension, verbal ability, mastery of high school content, social class identification, attitude towards teaching, and concept mastery in education. The instruments used in this study were:

1. The Ohio State Psychological Examination, Form 23, (OSPE), was designed to measure scholastic aptitude at the college or advanced level. The test is comprised of three sub-tests: same-opposite, word relationships, and reading comprehension. The test yields two scores, total and reading comprehension. Norms were based on a sample of 3,799 freshman in Ohio colleges. The correlations with a criterion of scholastic performance were consistently of the order, $r = .60$, with an occasional coefficient greater than, $r = .70$. Form 23 was published in 1947 as a power test and is widely used.

The total score was used as the basis of classifying students into high-, medium-, and low-scholastic aptitude groups for the first part of this study. The test was administered as a regular part of the testing program to all matriculating freshman at the University of Oklahoma.

2. The Cooperative School and College Ability Tests, Form 1C, (SCAT), is composed of four parts that measure two areas of abilities: one is related to student success in the verbal kind of school learning and the other is related to skill in number manipulation and problem solving. Form 1C which was designed to be used with college lower classmen

already enrolled measures school learned abilities rather than the capacity for school learning. A random sample of 307 cases drawn from 604 freshmen in fifteen colleges resulted in a single sub-test range from r = .82 to r = .87 as calculated by Kuder-Richardson Formula #20. The coefficients of internal consistency on the reported part scores based on pairs of sub-tests ranged from r = .91 to r = .93. Norms were given by the publishers in percentile bands.

The norms used for this study were grade 14 for fall testing based on 1,134 students in ninety-seven colleges. The mid-point of the bands was used as the basis of converting percentiles to T scores in order to make comparisons. The test was administered to the subjects during the first week of the fall semester of the 1960-1961 school year. Correlation between the T scores on the OSPE total and T scores on the verbal part of the SCAT yielded a coefficient of validity r = .81 with a standard error, $\pm$ 0.02. The obtained "t" value was 20.78 which was significant at the .01 level of confidence.

3. The Iowa High School Content Examination, (IHSC), published in 1943, consists of a twenty minute test with one hundred items on English and literature, a twenty minute test with sixty items on mathematics, a fifteen minute test with seventy-five items on science, and a twenty minute test with one hundred items on history and social studies. Five scores were recorded, English, mathematics, history, science, and

total achievement in decile ranks to indicate two things about college students: (1) achievement and mastery of secondary school level subjects, and (2) information concerning achievement and mastery for guidance and prognostic purposes at the college and university level. Correlations ranged from r = .50 to r = .60 between high school and college grades and scores on the individual sections of the test. Correlation between the total score and general grade point average were about the same. Reliability coefficients of all four sections were around r = .91 for grade thirteen.

The tests were administered as a regular part of the testing program to all matriculating freshmen at the University of Oklahoma. The mid-point of the decile was used as the basis of converting to T scores.

4. The Sims Social Class Identification (SCI) Occupational Rating Scale, (SIMS), was designed to reveal the social class with which a person unconsciously identifies himself, such as, working, middle-working, middle, upper-middle, upper, upper-upper. There were forty-two occupations listed that the subject was asked to indicate whether persons in each occupation generally belong to the same, a higher, or a lower class than he did. The class level of each occupation had been determined in advance so comparisons could be made. Scores ranging from 1-6 indicated identification with lower-working class; 7-12, working; 13-18, middle-working; 19-24, middle; 25-30, upper-middle; 31-36, upper;

and 37-42, upper-upper. Reliability as measured by split-half coefficient based on a wide range group of 200 high school and college students was r = .95. The product-moment correlation was r = .82 on 64 college freshmen tested and retested four months later.

This scale was administered to subjects during the first month of the fall semester of the 1960-1961 school year.

5. The Minnesota Teacher Attitude Inventory, Form A, (MTAI), was designed to predict the type of teacher-pupil relations a person will likely maintain in the classroom. A high score would indicate harmonious relations with students, characterized by high rapport, whereas, a low score would indicate teacher domination tendencies. The reliability calculated by the split-half method and corrected by the Spearman-Brown Formula yielded an r = .626 for a group of one hundred teachers of the fourth, fifth, and sixth grades.

Raw scores were converted to percentiles using beginning education junior elementary norms of the publishers. The percentiles were converted to T scores by means of a conversion table. The inventory was administered to subjects the first week of the fall semester of the 1960-1961 school year.

6. The criterion was measured by three eighty-item multiple-choice tests. A concept mastery test was constructed for each of the three sequential professional education courses:

(1) School in American Culture, (2) Human Growth and Development, and (3) Educational Guidance and Evaluation. These three tests were an outgrowth of Research Project #73403100 carried out in the College of Education at the University of Oklahoma during the 1960-1961 school year under a National Defense Education Act Title VII grant from the United States Office of Education.

Concepts in the three course areas were isolated through a content analysis of course outlines. Members of the University of Oklahoma faculty who regularly teach the courses were asked to evaluate the concepts as to their accuracy and to rank them in the order of their importance to the course. The inappropriate concepts were eliminated which resulted in final lists of approximately twenty-five concepts. One hundred fifty test items based on the concepts were written for each course. Faculty members who judged the concepts approved the items as to accuracy and structure. The items were randomly arranged to compose the format of the experimental edition of the test for each course, respectively. The tests were administered to students in the three courses at the end of the 1959-1960 spring semester. An item analysis was conducted to determine the item difficulty and discrimination indices for each test. The eighty best items were retained for the final edition of each test which was administered during the last class session of the fall semester of the 1960-1961 school year to students enrolled in

the courses. The score on the test was the total number of correct responses.

Correlations between test scores and grades assigned by instructors were computed for each course to determine the concurrent validity. Letter grades were converted to numerical values as follows: A was counted as twelve points; A-, eleven points; B+, ten points; B, nine points; B-, eight points; C+, seven points; C, six points; C-, five points; D+, four points; D, three points; D-, two points; and F, one point. For Education 52 between test scores and letter grades $r = .352$ ("t" = 3.96) which was significant at the .01 level. For Education 151 between test scores and letter grades $r = .399$ ("t" = 3.05) which was significant at the .01 level. For Education 222 between test scores and letter grades $r = .325$ ("t" = 2.94) which was significant at the .01 level. There was a positive relationship between letter grades and scores on concept mastery tests.

Procedure for the Treatment of the Data

The majority of the data on each subject in the study was obtained from the records of Research Project #73403100 in the College of Education under the direction of Professors W. R. Fulton and O. J. Rupiper. The project was a grant under the auspices of the United States Office of Education, Title VII of the National Education Defense Act, and involved the three sequential professional education courses at the

University of Oklahoma. Freshman grade point averages were obtained from the cumulative records in the College of Arts and Science, College of Education, College of Fine Arts, and the University College. Information relative to the Oklahoma public high schools from which the subjects graduated was gathered from the official records in the State Department of Education of the State of Oklahoma.

Decile ranks on the Ohio State Psychological Examination and the Iowa High School Content Examination and percentile ranks on the Cooperative School and College Ability Tests and the Minnesota Teacher Attitude Inventory were converted to T scores. The deciles divide a distribution into tenths, just as the percentiles divide it into hundreds. The percentile rank that would be the same as the mid-point of the decile rank was used to convert the decile ranks to T scores. Conversion to T scores was based on the table of the normal distribution curve.[1]

The data in the first part of the study were both continuous and discrete. In order to determine if there were significant differences in the characteristics among scholastic aptitude groups, "t" tests and Chi-square tests were computed. Raw data may be found in Appendix A; all the formulae may be found in Appendix D.

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[1]J. P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Company, Inc., 1956), pp. 533-34.

Before using the "t" test on the continuous data, it was necessary to make F tests to determine if the variances of the two groups were homogeneous.[1] The results of the application of the F tests for homogeneity of variance are presented in Appendix B. Five of the twenty-four ratios were significant which indicated that the variance between five groups on three characteristics was heterogeneous. For these five heterogeneous variances, "t" test formula that computed the variance of each mean separately instead of pooling the sums of squares and the corresponding degrees of freedom from the two groups was used.[2] A criterion "t" was calculated one time when the obtained value of "t" and the table value of "t" was very close.[3] The criterion "t" was more conservative.

Chi-square tests were computed when the data were in the form of frequencies.[4] The null hypotheses in the first part of the study were rejected at the .01 level of confidence.

The second part of the study involved the testing of zero order correlations between the criterion and eight

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[1] Ibid., p. 221.

[2] Allen L. Edwards, Experimental Design in Psychological Research (New York: Rinehart and Company, Inc., 1950), pp. 167-68.

[3] Ibid., pp. 168-69.

[4] Guilford, op. cit., p. 232.

independent variables. Raw data collected specifically for this study and not a part of Research Project #73403100 may be found in Appendix A; all the formulae may be found in Appendix D. Data were punched on IBM cards and processed by the Computer Laboratory of the University of Oklahoma. Outputs received for the nine variables for each of the three courses were means, standard deviation, and correlation coefficients. The correlation matrix for each course was inverted and partial correlation coefficients and multiple regression or b-coefficients were received as outputs. Intercorrelation matrices, partial correlation coefficients, Beta coefficients, b-coefficients, and constants may be found in Appendix C. From the data received from the Computer Laboratory, the "t" ratios for testing the significance of a coefficient were calculated.[1] The null hypotheses in the second part of the study were rejected at the .01 level of confidence.

The third part of the study involved the development of three regression equations. Coefficients of partial correlation were computed by the IBM 650 between the dependent criterion and each of the independent variables while holding constant or eliminating any linear tendency of the remaining seven variables that would obscure the relationship.[2] These

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[1] Ibid., p. 219.

[2] Mordecai Ezekiel and Karl A. Fox, Methods of Correlation and Regression Analysis (3rd ed.; New York: John Wiley and Sons, Inc., 1959), p. 192.

coefficients of partial correlation were tested for significance by "t" tests.[1] Scatter diagrams were plotted and inspected to ascertain if three assumptions were met: (1) the distribution of both sets of data appeared to be normal, (2) the line of best fit was rectilinear, and (3) the columns and rows were relatively homoscedastic.[2] The Beta coefficients were computed for those variables in each course that met the required assumptions by the Doolittle method.[3]

The multiple correlations were solved by taking the square root of the sums of the products of the beta coefficients multiplied by their corresponding correlations.[4] The standard errors were estimated to indicate how far the predicted values deviated from the obtained values.[5] The coefficients of multiple determination were obtained for interpretation purposes.[6] The regression equations were developed from the variables used in computing the multiple correlations.[7]

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[1]Quinn McNemar, Psychological Statistics (2nd ed.; New York: John Wiley and Sons, Inc., 1955), p. 167.

[2]Guilford, op. cit., pp. 149-51.

[3]Ibid., pp. 405-409.

[4]Ibid., p. 409.

[5]McNemar, op. cit., p. 185.

[6]Guilford, op. cit., p. 397.

[7]Ezekiel and Fox, op. cit., p. 152.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The first part of the study was concerned primarily with determining if there were any significant differences in characteristics among college students with high-, medium-, and low-scholastic aptitude. Eighteen specific null hypotheses were established in order to accomplish the first purposes of the study. Hypotheses 1-6 were related to mastery and achievement, hypotheses 7-10 were related to background information, hypotheses 11-14 were related to teaching, and hypotheses 15-18 were related to the Oklahoma public high school from which the subject graduated. For purposes of this part of the study the required level of significance was set at the .01 level of confidence.

Mastery and Achievement

Hypothesis 1 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to reading comprehension. Between high- and medium-scholastic aptitude groups the obtained "t" value was 13.41 and the required

value for significance was 2.62; between high- and low-scholastic aptitude groups the obtained "t" value was 23.41 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t" value was 10.42 and the required value for significance was 2.61. These were statistically significant differences in favor of the higher scholastic group with the greatest difference between the high- and low-scholastic groups. The null hypothesis was rejected and subjects who scored high in scholastic aptitude scored significantly higher in reading comprehension. The "t" ratios for this part of the study are presented in Table 5.

Hypothesis 2 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school English. Between high- and medium-scholastic aptitude groups the obtained "t" value was 5.63 and the required value for significance was 2.62; between high- and low-scholastic aptitude groups the obtained "t" value was 14.86 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t" value was 8.26 and the required value for significance was 2.61. These were statistically significant differences in favor of the higher scholastic group with the greatest difference between the high- and low-scholastic aptitude groups. The null hypothesis was rejected and

TABLE 5

DIFFERENCE OF MEANS BETWEEN SCHOLASTIC APTITUDE GROUPS RELATIVE TO CERTAIN CHARACTERISTICS

Area	Scholastic Aptitude Groups			Mean Diff.	$SE_{Diff.}$	"t"
	High (N=57)	Medium (N=66)	Low (N=75)			
		Means				
Reading Comprehension	60.2	49.5		10.7	.798	13.41**
	60.2		41.8	18.4	.786	23.41**
		49.5	41.8	7.7	.739	10.42**
English	61.4	55.2		6.2	1.102	5.63**
	61.4		45.8	15.6	1.052	14.86**
		55.2	45.8	9.4	1.138	8.26**
Mathematics	54.5	48.9		5.6	1.631	3.43**
	54.5		44.5	10.0	.472	21.19**
		48.9	44.5	4.4	1.399	3.14**
Science	54.4	48.8		5.6	1.504	3.73**
	54.4		43.6	10.8	1.476	7.32**
		48.8	43.6	5.2	1.272	4.09**

TABLE 5--Continued

Area	Scholastic Aptitude Groups: High (N=57)	Medium (N=66)	Low (N=75)	Mean Diff.	$SE_{Diff.}$	"t"
		Means				
History	52.6	47.9		4.7	1.328	3.54**
	52.6		41.5	11.1	1.325	8.38**
		47.9	41.5	6.4	1.180	5.42**
Freshman Grade Point Average	3.06	2.53		.53	.092	5.76**
	3.06		2.12	.94	.085	10.59**
		2.53	2.12	.41	.084	4.83**
Social Class	22.0	22.6		.6	.795	.75
	22.0		21.6	.4	.697	.57
		22.6	21.6	1.0	.848	1.18
Attitude Towards Teaching	39.2	37.8		1.4	1.411	.99
	39.2		35.8	3.4	1.288	2.64*
		37.8	35.8	2.0	1.294	1.55

**Significant at the .01 level.
*Significant at the .05 level.

subjects who scored high in scholastic aptitude scored significantly higher in mastery of high school English.

Hypothesis 3 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school mathematics. Between high- and medium-scholastic aptitude groups the obtained "t" value was 3.43 and the required value for significance was 2.62; between high-, and low-scholastic aptitude groups the obtained "t" value was 21.19 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t" value was 3.14 and the required value for significance was 2.61. These were statistically significant differences in favor of the higher scholastic groups with the greatest difference between the high- and low-scholastic aptitude groups. The null hypothesis was rejected and subjects who scored high in scholastic aptitude scored significantly higher in mastery of high school mathematics.

Hypothesis 4 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school science. Between high- and medium-scholastic aptitude groups the obtained "t" value was 3.73 and the required value for significance was 2.62; between the high- and low-scholastic aptitude groups the obtained "t" value was 7.32 and the required value for significance was 2.61; and between

medium- and low-scholastic aptitude groups the obtained "t" value was 4.09 and the required value for significance was 2.61. These were statistically significant differences in favor of the higher scholastic groups with the greatest difference between the high- and low-scholastic aptitude groups. The null hypothesis was rejected and subjects who scored high in scholastic aptitude scored significantly higher in mastery of high school science.

Hypothesis 5 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to mastery of high school history. Between high- and medium-scholastic aptitude groups the obtained "t" value was 3.54 and the required value for significance was 2.62; between high- and low-scholastic aptitude groups the obtained "t" value was 8.38 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t" value was 4.09 and the required value for significance was 2.61. These were statistically significant differences in favor of the higher scholastic groups with the greatest difference between the high- and the low-scholastic aptitude groups. The null hypothesis was rejected and subjects who scored high in scholastic aptitude scored significantly higher in mastery of high school history.

Hypothesis 6 was: There is no statistically significant mean difference among college students with high-,

medium-, and low-scholastic aptitude with regard to grade point average for their freshman year in college. Between high- and medium-scholastic aptitude groups the obtained "t" value was 5.76 and the required value for significance was 2.62; between high- and low-scholastic aptitude groups the obtained "t" value was 10.59 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t" value was 4.83 and the required value for significance was 2.61. These were statistically significant differences in favor of the higher scholastic groups with the greatest difference between the high- and low-scholastic aptitude groups. The null hypothesis was rejected and subjects who scored high in scholastic aptitude scored significantly higher in grade point average for their freshman year in college.

Background Information

Hypothesis 7 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to social class identification. Between the high- and medium-scholastic aptitude groups the obtained "t" value was .75 and the required value for significance was 2.62; between high- and low-scholastic aptitude groups the obtained "t" value was .57 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t"

value was 1.18 and the required value for significance was 2.61. Since the obtained value of "t" did not exceed the required value for significance, the null hypothesis of no difference in social class identification was accepted.

Hypothesis 8 was: There is no statistically significant difference in the frequence of college students with high-, medium-, and low-scholastic aptitude with regard to the occupation of parent. The obtained Chi-square was 12.38 and the required value for significance was 26.22. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in occupation of parent was accepted. The cell-square contingencies are presented in Table 6.

Hypothesis 9 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the educational level of mother. The obtained Chi-square was 4.01 and the required value for significance was 20.09. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in educational level of mother was accepted. The cell-square contingencies are presented in Table 7.

Hypothesis 10 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to educational level of father. The obtained Chi-square was

TABLE 6

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO OCCUPATION OF PARENT

Occupation	High (N=57)	Medium (N=66)	Low (N=75)	Total
Professional and managerial	.663	.387	.020	1.070
Clerical and sales	1.079	.047	1.170	2.296
Service	.994	2.000	.290	3.284
Agriculture, fishery, forestry, and kindred	.390	.44	.197	.631
Skilled	.009	.007	.003	.019
Semi-skilled	1.256	2.600	.333	4.189
Unskilled	.500	.266	.128	.894
Total	4.891	5.351	2.141	$\chi^2 = 12.383$ (df=12)

TABLE 7

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO EDUCATIONAL LEVEL OF MOTHER

Educational Level of Mother	High (N=57)	Medium (N=66)	Low (N=75)	Total
Not high school graduate	.666	.000	.558	1.224
High school graduate	.040	.227	.084	.351
Some college	.002	.450	.321	.773
College graduate	.227	.100	.468	.795
Postgraduate work	.008	.457	.400	.865
Total	.943	1.234	1.831	$\chi^2 = 4.008$ (df=8)

6.11 and the required value for significance was 20.09. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in educational level of father was accepted. The cell-square contingencies are presented in Table 8.

Teaching Information

Hypothesis 11 was: There is no statistically significant difference in the frequency of college students

TABLE 8

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO EDUCATIONAL LEVEL OF FATHER

Educational Level of Father	High (N=57)	Medium (N=66)	Low (N=75)	Total
Not high school graduate	.669	1.600	.255	2.524
High school graduate	.436	.004	.438	.878
Some college	.018	.010	.002	.030
College graduate	.003	.144	.145	.292
Postgraduate work	.077	.998	1.312	2.387
Total	1.203	2.756	2.152	$\chi^2 = 6.111$ (df=8)

with high-, medium-, and low-scholastic aptitude with regard to college within the university to which assigned. The obtained Chi-square value was 46.27 and the required value for significance was 16.81. Since this value was statistically significant at the .01 level, the null hypothesis was rejected. This indicated that the frequency of students at the various levels of scholastic aptitude was not contingent with the college within the university to which assigned. The cell-square contingencies are presented in Table 9.

TABLE 9

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO COLLEGE WITHIN THE UNIVERSITY TO WHICH ASSIGNED

College	High (N=57)	Medium (N=66)	Low (N=75)	Total
Arts and Science	20.256	2.434	-5.959	28.649
Education	5.853	1.496	.984	8.333
Fine Arts	.426	.092	.666	1.184
University College	3.206	.336	4.562	8.104
Total	29.741	4.358	12.171	χ^2 = 46.270** (df=6)

**Significant at the .01 level.

Hypothesis 12 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to major teaching field. The obtained Chi-square value was 51.47 and the required value for significance was 45.64. Since this value was statistically significant at the .01 level of confidence, the null hypothesis was rejected. This indicated that the frequency of students at the various levels of scholastic aptitude was not contingent with major teaching field. The cell-square contingencies are presented in Table 10.

TABLE 10

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO TEACHING FIELD

Teaching Field	High (N=57)	Medium (N=66)	Low (N=75)	Total
Art	.052	.000	.18	.070
Business Education	2.616	.913	1.044	4.573
Elementary	5.155	3.011	.145	8.311
Foreign Language	.752	.000	.500	1.252
Home Economics	.500	.213	.061	.774
Industrial Arts	1.700	.500	3.563	5.763
Language Arts	11.156	1.312	3.102	15.570
Mathematics	4.828	.225	1.800	6.853
Music	.500	.039	.138	.677
Physical Education	.039	.984	1.333	2.356
Science	.047	.250	.500	.797
Social Studies	.125	.568	.185	.878
Special Education	.114	.100	.022	.236

TABLE 10--Continued

Teaching Field	High (N=57)	Medium (N=66)	Low (N=75)	Total
Speech	.514	.875	1.970	3.359
Total	28.098	8.990	14.381	χ^2 = 51.469** (df=26)

**Significant at the .01 level.

Hypothesis 13 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to whether working towards an elementary, secondary, or a combination 1-12 certificate. The obtained Chi-square value was 12.66 and the required value for significance was 13.28. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in whether working towards an elementary, secondary, or a combination 1-12 certificate was accepted. The cell-square contingencies are presented in Table 11.

Hypothesis 14 was: There is no statistically significant mean difference among college students with high-, medium-, and low-scholastic aptitude with regard to attitude towards teaching. Between high- and medium-scholastic aptitude groups the obtained "t" value was .99 and the required value for significance was 2.62; between high- and low-scholastic aptitude groups the obtained "t"

TABLE 11

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO CERTIFICATION LEVEL

Certification Level	High (N=57)	Medium (N=66)	Low (N=75)	Total
Elementary	4.332	3.139	2.039	7.510
Secondary	.389	.876	.121	1.386
Grades 1-12	2.400	.014	1.353	3.767
Total	7.121	4.029	1.513	$\chi^2 = 12.663$ (df=4)

value was 2.64 and the required value for significance was 2.61; and between medium- and low-scholastic aptitude groups the obtained "t" value was 1.54 and the required value for significance was 2.61. Because the obtained "t" value between high- and low-scholastic aptitude groups was so close to the borderline of significance, the required value for significance was calculated by Formula 6, Appendix D. The value required by this method was 2.66. Since the obtained value did not exceed the criterion value of "$t_{.01}$", the null hypothesis of no difference in attitude towards teaching was accepted. The "t" ratios are presented in Table 5.

Oklahoma High School Information

Hypothesis 15 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the size of their high school graduating class. The obtained Chi-square was 10.07 and the required value for significance was 20.09. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in the size of the high school graduating class was accepted. The cell-square contingencies are presented in Table 12.

TABLE 12

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO SIZE OF HIGH SCHOOL GRADUATING CLASS

Size of Class	High (N=57)	Medium (N=66)	Low (N=75)	Total
1 - 49	1.506	.900	3.821	6.227
50 - 99	.010	.174	.090	.274
100 - 199	.010	.050	.090	.150
200 - 299	.009	.052	.016	.077
300 and above	1.443	.095	1.800	3.338
Total	2.978	1.271	5.817	$\chi^2 = 10.066$ (df=8)

Hypothesis 16 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to whether or not their high school was accredited by the North Central Association of Colleges and Secondary Schools. The obtained Chi-square was 4.01 and the required value for significance was 9.21. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in whether or not their high school was accredited was accepted. The cell-square contingencies are presented in Table 13.

TABLE 13

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO WHETHER OR NOT ACCREDITED BY NORTH CENTRAL ASSOCIATION

Accredited	High (N=57)	Medium (N=66)	Low (N=75)	Total
Yes	.247	.008	.270	.525
No	1.633	.056	1.800	3.489
Both	1.880	.064	2.070	$\chi^2 = 4.014$ (df=2)

Hypothesis 17 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the proportion of their high school teachers having master's degrees. The obtained Chi-square was 2.70 and the required value for significance was 13.28. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in proportion of their high school teachers having master's degrees was accepted. The cell-square contingencies are presented in Table 14.

TABLE 14

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO THE PROPORTION OF HIGH SCHOOL TEACHERS HAVING MASTER'S DEGREES

Proportion Having Master's Degrees	High (N=57)	Medium (N=66)	Low (N=75)	Total
Less than .30	.110	.431	.757	1.298
.30 through .49	.438	.209	.022	.669
.50 and above	.195	.470	.066	.731
Total	.743	1.110	.845	$\chi^2 = 2.698$ (df=4)

Hypothesis 18 was: There is no statistically significant difference in the frequency of college students with high-, medium-, and low-scholastic aptitude with regard to the educational level of their principal. The obtained value of Chi-square was 2.92 and the required value for significance was 13.28. Since the obtained value did not exceed the required value for significance, the null hypothesis of no difference in educational level of high school principal was accepted. The cell-square contingencies are presented in Table 15.

TABLE 15

THE CELL-SQUARE CONTINGENCIES FOR CHI-SQUARE TEST AMONG SCHOLASTIC APTITUDE GROUPS RELATIVE TO THE EDUCATIONAL LEVEL OF HIGH SCHOOL PRINCIPAL

Highest Degree Obtained	High (N=57)	Medium (N=66)	Low (N=75)	Total
Bachelor's	.642	.250	1.388	2.280
Master's	.131	.018	.196	.345
Doctor's	.166	.000	.125	.291
Total	.939	.268	1.709	$\chi^2 = 2.916$ (df=4)

The second part of the study was concerned with determining if there were any statistically significant correlations between the criterion, success in the three professional education courses, and eight independent variables. For purposes of testing the eight zero order correlations the required level of significance was set at the .01 level of confidence. Zero order correlations between the criterion and the eight independent variables for the three courses are presented in Table 16. These coefficients were tested for significance by finding their "t" ratio values. After the eight specific hypotheses were tested, the multiple regression equations were developed and the multiple correlation coefficients were computed in the third part of the study.

Relationship between Criterion and Independent Variables

Hypothesis 19 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and scholastic aptitude. In Education 52, Education 151, and Education 222 the obtained coefficients of correlation were r = .595 ("t" = 7.80), r = .391 ("t" = 3.15), and r = .611 ("t" = 6.59), respectively. These were statistically significant at the .01 level. The null hypothesis was rejected and the correlations were considered to have occurred as a

TABLE 16

ZERO ORDER COEFFICIENTS OF CORRELATION BETWEEN CRITERION AND EIGHT INDEPENDENT VARIABLES

Coefficient	Education 52	Education 151	Education 222
r_{12}	.595**	.391**	.611**
r_{13}	.587**	.482**	.578**
r_{14}	.520**	.373**	.456**
r_{15}	.508**	.379**	.458**
r_{16}	.564**	.248	.379**
r_{17}	.728**	.450**	.688**
r_{18}	.330**	.319*	.455**
r_{19}	-.055	-.167	-.033

**Significant at the .01 level.
*Significant at the .05 level.

result of a relationship between success in the professional education courses and scholastic aptitude.

Hypothesis 20 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and reading comprehension. In Education 52, Education 151, and Education 222 the obtained coefficients of correlation were r = .587 ("t" = 7.64), r = .482 ("t" = 4.08), and r = .578 ("t" = 6.05), respectively. These were statistically significant at the .01 level. The null hypothesis was rejected

and the correlations were considered to have occurred as a result of a relationship between success in the professional education courses and reading comprehension.

Hypothesis 21 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and mastery in high school English. In Education 52, Education 151, and Education 222 the obtained coefficients of correlation were r = .520 ("t" = 6.41), r = .373 ("t" = 2.98), and r = .456 ("t" = 4.38), respectively. These were statistically significant at the .01 level. The null hypothesis was rejected and the correlations were considered to have occurred as a result of a relationship between success in the professional education courses and mastery in high school English.

Hypothesis 22 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and mastery in high school history. In Education 52, Education 151, and Education 222 coefficients of correlation were r = .508 ("t" = 6.21), r = .379 ("t" = 3.04), and r = .458 ("t" = 4.40), respectively. These were statistically significant at the .01 level. The null hypothesis was rejected and the correlations were considered to have occurred as a result of a relationship between success in the professional education courses and mastery in high school history.

Hypothesis 23 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and grade point average for the freshman year in college. In Education 52, Education 151, and Education 222 the obtained coefficients of correlation were $r = .564$ ("t" = 7.20), $r = .248$ ("t" = 1.90), and $r = .379$ ("t" = 3.50), respectively. Two of these were statistically significant at the .01 level. The null hypothesis was rejected and the correlations in Education 52 and Education 222 were considered to have occurred as a result of a relationship between success in the professional education courses and grade point average for the freshman year of college.

Hypothesis 24 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and verbal ability. In Education 52, Education 151, and Education 222 the obtained coefficients of correlation were $r = .728$ ("t" = 11.19), $r = .450$ ("t" = 3.74), and $r = .688$ ("t" = 8.10), respectively. These were statistically significant at the .01 level. The null hypothesis was rejected and the correlations were considered to have occurred as a result of a relationship between success in the professional education courses and verbal ability.

Hypothesis 25 was: There is no statistically significant correlation between the criterion, success in the

professional education courses, and attitude towards teaching. In Education 52, Education 151, and Education 222 the obtained coefficients of correlation were r = .330 ("t" = 3.68), r = .319 ("t" = 2.50), and r = .455 ("t" = 4.37), respectively. Two of these were statistically significant at the .01 level. The null hypothesis was rejected and the correlations in Education 52 and Education 222 were considered to have occurred as a result of a relationship between success in the professional education courses and attitude toward teaching.

Hypothesis 26 was: There is no statistically significant correlation between the criterion, success in the professional education courses, and social class identification. In Education 52, Education 151, and Education 222 coefficients of correlation were r = -.055 ("t" = .58), r = -.167 ("t" = 1.26), and r = -.033 ("t" = .28), respectively. Since the obtained values did not exceed the required values for significance, the null hypothesis of no correlation between success in the professional education courses and social class identification was accepted.

Multiple Correlations

The coefficients of correlation in the preceding section were tested for statistical significance by running "t" ratios to determine if their relationship to the criterion, success in professional education courses, was

significant. In order to have a better understanding of the relationship of each independent variable to the criterion when the influence of the other seven variables was held constant, partial correlations were also tested for significance by "t" tests. The size of the zero order coefficients, the size of the partial coefficients, and the size of the Beta coefficients were used as the basis of selection of variables as the best predictors of success. Scatter diagrams of selected variables with the criterion were plotted and inspected for three assumptions: normal distribution, rectilinearity, and homoscedasticity.[1] From the eight independent variables tested and inspected the three best predictors that met the underlying assumptions were combined to compute the coefficients of multiple correlation. The coefficients of multiple correlation indicate the combined importance of the selected independent variables to the criterion.

The coefficients of multiple correlation were interpreted for each course in three ways. The standard error of estimate was computed as a measure of the variability of the discrepancies between the actual and the predicted scores. The significance of the coefficients were tested by entering the table of coefficients of correlation with

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[1] Guilford, op. cit., pp. 149-51.

N - m degrees of freedom and four variables, where N is the number of cases and m is the number of variables.[1] The coefficients of multiple determination tell the proportions of variance in the criterion, success in the professional education courses, that were predicted by the three selected independent variables combined with their regression weights. The variances were reported in terms of percentages by multiplying the proportions by one hundred.

In Education 52, School in American Culture, the three variables in order of the size of the Beta weights were: X_7, T score of verbal ability on the Cooperative School and College Ability Tests, Form 1C; X_6, grade point average for freshman year in college; and X_8, T score on the Minnesota Teacher Attitude Inventory, Form A. The solution for the coefficient of multiple correlation was as follows:

$$R^2_{1\cdot 768} = (.5746)(.728) + (.2440)(.564) + (.2039)(.330)$$

$$R_{1\cdot 768} = .789$$

The obtained value of the multiple correlation was significant at the .01 level of confidence. The standard error of estimate was $SE_R = \pm .035$. The coefficient of multiple determination was .6577 indicating that 65.77 per cent of the variance on the test, School in American Culture, was accounted

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[1] Ibid., p. 538.

for by the variation in the three selected variables combined. This amount was further divided as follows: 32.49 per cent by correlation with verbal ability; 5.76 per cent by correlation with grade point average for the freshman year; 4.16 per cent by correlation with attitude towards teaching; 14.36 per cent by indirect correlation with verbal ability and grade point average for the freshman year; 4.62 per cent by indirect correlation with verbal ability and attitude towards teaching; and 1.31 per cent by indirect correlation with grade point average for the freshman year and attitude towards teaching.

In Education 151, Human Growth and Development, the three variables in order of the size of the Beta weights were: X_3, T score in reading comprehension on the Ohio State Psychological Examination, Form 23; X_8, T score on the Minnesota Teacher Attitude Inventory, Form A; and X_7, T score of verbal ability on the Cooperative School and College Ability Tests, Form 1C. The solution for the coefficient of multiple correlation was as follows:

$$R^2_{1\cdot 387} = (.3247)(.482) + (.1862)(.319) + (.1312)(.450)$$

$$R_{1\cdot 387} = .524$$

The obtained value of the multiple correlation was significant at the .01 level of confidence. The standard error of estimate was $SE_R = \pm .096$. The coefficient of multiple

determination was .2749 indicating that 27.49 per cent of the variance on the test, Human Growth and Development, was accounted for by the variation in the three selected variables combined. This amount was further divided as follows: 10.54 per cent by correlation with reading comprehension; 3.47 per cent by correlation with attitude towards teaching; 1.72 per cent by correlation with verbal ability; 3.40 per cent by indirect correlation with reading comprehension and attitude towards teaching; 6.82 per cent by indirect correlation with reading comprehension and verbal ability; and 1.55 per cent by indirect correlation with attitude towards teaching and verbal ability.

In Education 222, Educational Evaluation and Guidance, the three variables in order of the size of the Beta weights were: X_7, T score of verbal ability on the Cooperative School and College Ability Tests, Form 1C; X_2, T score on the total score of the Ohio State Psychological Examination, Form 23; and X_8, T score on the Minnesota Teacher Attitude Inventory, Form A. The solution for the coefficient of multiple correlation was as follows:

$$R^2_{1\cdot 728} = (.4812)(.688) + (.1581)(.611) + (.1874)(.455)$$

$$R_{1\cdot 728} = .716$$

The obtained value of the multiple correlation was significant at the .01 level of confidence. The standard error of

estimate was $SE_R = \pm .056$. The coefficient of multiple determination was .5129 indicating that 51.29 per cent of the variance on the test, Educational Evaluation and Guidance, was accounted for by the variation in the three selected variables combined. This amount was further divided as follows: 23.16 per cent by correlation with verbal ability; 2.50 per cent by correlation with scholastic aptitude; 3.51 per cent by correlation with attitude towards teaching; 12.10 per cent by indirect correlation with verbal ability and scholastic aptitude; 7.81 per cent by indirect correlation with verbal ability and attitude towards teaching; 2.22 per cent by indirect correlation with scholastic aptitude and attitude towards teaching.

Regression Equations

The multiple regression equation computed is the sum of the constant and the products of the selected independent variables and their corresponding b or regression coefficients. The b or regression coefficients show how many fractional parts of units the predicted variable changes for each unit of change in the independent variables. The constant is computed by subtracting the sum of the products of the means of the independent variables and their corresponding b or regression coefficients from the mean of the criterion. Graphically, the b-coefficients represent the slope of the regression line and (a) represents the value where the line

crosses the axis of the predicted variable.[1] The regression equations indicate the relationship of the dependent criterion, success in the professional education courses, to the selected independent variables, respectively, excluding the influence of the other independent variables.

The purpose of the multiple correlations in the preceding section was to determine the effectiveness of the three selected independent variables in predicting success in the three professional education courses. Since the multiple correlations were significant at the .01 level of confidence, the same variables were used in the development of the regression equations for actual prediction of success.

The regression equations for the three professional education courses were as follows:

Education 52

$$X_1 = 1.92 + (.5746)X_7 + (3.1387)X_6 + (.2039)X_8$$

Education 151

$$X_1 = 18.63 + (.3091)X_3 + (.2131)X_8 + (.1099)X_7$$

Education 222

$$X_1 = 18.19 + (.3418)X_2 + (.1254)X_7 + (.1377)X_8$$

In Chapter I success was defined as a score on the concept mastery test that was greater than one standard deviation below the mean. On this basis scores ≥ 37, ≥ 41, and ≥ 41 on the

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[1] McNemar, op. cit., pp. 170-71.

concept mastery test were considered as indicating success in Education 52, Education 151, and Education 222, respectively.

Summary

On the basis of the analysis of the data in the first part of the study nine of the eighteen null hypotheses were rejected. All six of the null hypotheses related to achievement and mastery were rejected, indicating that scholastic aptitude was a responsible factor in reading comprehension, mastery of high school English, mathematics, science, and history, and freshman grade point average in college.

The four null hypotheses related to background were accepted, indicating that scholastic aptitude was not significantly affected by social class identification, occupation of parent, or educational level of parents.

Relative to information on teaching two of the null hypotheses were accepted and two were rejected, indicating that the frequency of students at the various scholastic aptitude levels was contingent with certification level and attitude towards teaching but was not contingent with college within the university to which assigned or major teaching field. The College of Arts and Science tended to attract a greater proportion of students with high-scholastic aptitude than other colleges within the University of Oklahoma. The teaching fields of language arts and mathematics tended to attract a greater proportion of students

with high-scholastic aptitude than the other teaching fields.

The four null hypotheses related to the Oklahoma high schools from which the subjects graduated were accepted, indicating that scholastic aptitude was not affected significantly by the size of the graduating class, whether or not accredited by the North Central Association, the proportion of teachers having master's degrees, or the educational level of the principal.

On the basis of an analysis of data in the second part of the study seven of the eight null hypotheses were rejected relative to Education 52, School in American Culture, because the correlations were significant at the .01 level of confidence. The independent variables that correlated significantly with success were: verbal ability, scholastic aptitude, reading comprehension, grade point average for the freshman year in college, mastery of high school English, mastery of high school history, and attitude towards teaching. The coefficient between success and social class identification was not significant.

Five of the eight null hypotheses were rejected relative to Education 151, Human Growth and Development, because the correlations were significant at the .01 level of confidence. The independent variables that correlated significantly with success were: reading comprehension, verbal ability, scholastic aptitude, mastery of high school

history, and mastery of high school English. The independent variables that did not correlate significantly with success were: attitude towards teaching, grade point average for the freshman year in college, and social class identification.

Seven of the eight null hypotheses were rejected relative to Education 222, Educational Evaluation and Guidance, because the correlations were significant at the .01 level of confidence. The independent variables that correlated significantly with success were: verbal ability, scholastic aptitude, reading comprehension, mastery of high school history, mastery of high school English, attitude towards teaching, and grade point average for the freshman year in college. The correlation coefficient between success and social class identification was not statistically significant.

Coefficients of multiple correlation and determination for the three professional education courses were $R = .789$ and $R^2 = .6577$, $R = .524$ and $R^2 = .2749$, and $R = .716$ and $R^2 = .5129$. Coefficients of multiple correlation were statistically significant at the .01 level of confidence.

Regression equations were solved for the prediction of success in the three sequential professional education courses. They were based on the three independent variables used in the respective multiple correlations. Predicted scores ≥ 37, ≥ 41, and ≥ 41 on the regression equation

were considered as the criterion score for predicting success in Education 52, Education 151, and Education 222, respectively.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was designed to determine the effectiveness of scholastic aptitude and other selected variables in the prediction of success in the three sequential professional education courses of the teacher education program at the University of Oklahoma. The design of the study required the testing of two general hypotheses: that there are no statistically significant differences in selected characteristics among college students with high-, medium-, and low-scholastic aptitude, and that there are no statistically significant correlations between the criterion, success in one of the three sequential professional education courses, and the independent variables, scholastic aptitude and other selected characteristics. The general hypotheses were divided into twenty-six specific null hypotheses.

The sample included 632 students enrolled in sixteen sections of the three required sequential professional education courses of the teacher education program at the

University of Oklahoma during the fall semester of the 1960-1961 school year. Of this group 198 students met the general requirements for selection for the first part of the study and 245 for the second part of the study. Criteria for selection were: undergraduate, graduate of an Oklahoma public high school, planning to teach, less than twenty-five years of age, matriculated as a freshman at the University of Oklahoma, no previous classroom teaching experience, and complete data available.

Instruments used in the study were the Ohio State Psychological Examination, Form 23, the Cooperative School and College Ability Tests, Form 1C, the Iowa High School Content Examination, the Sims Social Class Identification (SCI) Occupational Rating Scale, the Minnesota Teacher Attitude Inventory, Form A, and concept mastery tests in the three education courses. The majority of the data on each subject in the study was obtained from the records of Research Project #73403100 in the College of Education under a Title VII grant of the National Education Defense Act.

Statistical tests indicated significant differences at the .01 level among scholastic aptitude groups with regard to nine of the eighteen null hypotheses. The number of significant correlations at the .01 level were seven out of eight in Education 52, five out of eight in Education 151, and seven out of eight in Education 222. Multiple correlations of .789, .524, and .716 with three selected

variables were significant at the .01 level.

Conclusions

From the results of the investigation the following conclusions were made concerning the subjects in this study:

1. That scholastic aptitude had an effect upon reading comprehension, mastery of high school English, mastery of high school science, mastery of high school mathematics, mastery of high school history, and grade point average for the freshman year in college. The greater the scholastic aptitude, the greater the achievement in these areas was apt to be.

2. That the frequency of students in different scholastic aptitude groups did not differ with regard to social class identification, occupation of parent, and educational level of parents. Background did not tend to affect scholastic aptitude.

3. That the frequency of students in different scholastic aptitude groups differed with regard to college within the university to which assigned. The College of Arts and Science tended to attract a greater proportion of students with high-scholastic aptitude than other colleges.

4. That the frequency of students in different scholastic aptitude groups differed with regard to major

teaching field. The teaching fields of language arts and mathematics tended to attract a greater proportion of students with high-scholastic aptitude than other fields.

5. That scholastic aptitude had no apparent effect upon attitude towards teaching. Attitude towards teaching was not apt to be affected by scholastic aptitude.

6. That the number of students in different scholastic aptitude groups did not differ with regard to certification level. The level at which a student planned to teach was not apt to be affected by scholastic aptitude.

7. That the number of students in different scholastic aptitude groups did not differ with regard to size of graduating class, whether accredited by North Central Association, the proportion of teachers with master's degrees, or the educational level of the principal. Only thirty or 15.2 per cent of the subjects graduated with a class size of less than fifty students; only twenty-five or 12.6 per cent of the subjects graduated from high schools that were not accredited by the North Central Association; and only eleven or 5.6 per cent of the subjects graduated from high schools whose principal had only a bachelor's degree.

8. That success in the sequential professional education courses was related to scholastic aptitude, reading comprehension, mastery of high school English, mastery of high school history, grade point average for the freshman

year in college, verbal ability, and attitude towards teaching. The greater the score on these variables, the greater the score was apt to be on the concept mastery test.

9. That success in the sequential professional education courses was not related to social class identification. A subject's conception of his social class identification did not tend to affect success in the professional education courses.

10. That verbal ability, grade point average for the freshman year in college, and attitude towards teaching had a significant multiple correlation of .789 with success in Education 52. These variables combined accounted for 65.77 per cent of the score on the concept mastery test in the course.

11. That reading comprehension, attitude towards teaching, and verbal ability had a significant multiple correlation of .524 with success in Education 151. These variables combined accounted for 27.49 per cent of the score on the concept mastery test in the course.

12. That verbal ability, scholastic aptitude, and attitude towards teaching had a significant multiple correlation of .716 with success in Education 222. These variables combined accounted for 51.29 per cent of the score on the concept mastery test in the course.

Recommendations

From the results of the investigation the following recommendations are presented:

1. That the multiple regression equation developed in this study for Education 52 be used as the basis for permission to enroll in Education 52. This recommendation would necessitate that the two instruments used to obtain two of the independent variables in the equation be administered prior to the sophomore year. A predicted score $\geq$ 37 would be considered as the criterion for predicting success in the course.

2. That admission to the teacher education program at the University of Oklahoma be based on the successful completion of Education 52 and the recommendation of a College of Education faculty committee after an interview with the student.

3. That permission to continue in teacher education be the prerogative of a College of Education faculty committee whose decision would be based on the successful completion of Education 151 and the use of the multiple regression equation developed in this study for predicting success in Education 222. This recommendation would necessitate that the instrument measuring attitude towards teaching be repeated before permission is granted to enroll in Education 222. A predicted score $\geq$ 41 would be considered as the criterion for predicting success in the course.

4. That a longitudinal study be conducted using the subjects of this study to determine which students successfully complete the teacher education program at the University of Oklahoma and which students later become successful teachers.

5. That a factor analysis study be done using the three concept mastery tests and other data of this study.

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APPENDIX A

TABLE 17

DATA ON THE CLASSIFICATION OF CERTAIN CHARACTERISTICS OF HIGH-SCHOLASTIC APTITUDE STUDENTS INTO CATEGORIES

Subjects	Occupational Group of Parent	Educational Level of Mother	Educational Level of Father
56	6	AB	8
67	5	12	8
76	6	13	8
98	1	AB	BS
106	1	14	DO
116	1	12	AB
127	5	12	10
128	1	12	AB
139	1	12	DDS
147	4	15	12
182	1	15	15
199	1	AB	13
204	1	15	BS
207	2	13	13
217	1	12	AB
220	2	MA	13
229	5	12	12
233	1	BS	MA
255	5	8	6
256	1	14	AB
257	1	14	12
261	1	AB	LLB
303	2	AB	12
319	1	14	12
322	1	AB	LLB
331	2	13	12
361	3	15	12
363	5	12	8
364	5	12	12
373	1	BS	MS
375	4	12	12
440	1	13	AB
447	1	14	AB
453	2	AB+	14
456	6	12	8
461	1	AB	MA
471	5	8	12
472	2	BS	AB
476	1	14	AB

TABLE 17--Continued

Subjects	Occupational Group of Parent	Educational Level of Mother	Educational Level of Father
501	2	9	14
504	2	12	10
506	6	12	11
517	1	12	14
518	1	BS	MD
519	5	12	12
532	5	12	12
541	3	12	13
549	2	AB+	12
602	1	14	MEd
606	1	12	14
609	2	12	14
611	1	AM	14
628	2	12	12
640	5	12	13
644	3	10	8
650	1	13	8
659	2	15	13

TABLE 17--Continued

Subjects	College To Which Assigned	Major Teaching Field	Certification Level
56	5	Music	1-12
67	1	Foreign Language	Secondary
76	3	Elementary	Elementary
98	3	Elementary	Elementary
106	1	Speech	Elementary
116	1	Social Studies	Secondary
127	1	Mathematics	Secondary
128	5	Drama	Secondary
139	1	Biology	Secondary
147	1	Physical Education	Secondary
182	3	English	Secondary
199	1	Foreign Language	Secondary
204	1	English	Secondary
207	3	Social Studies	Secondary
217	1	English	Secondary
220	1	Social Studies	Secondary
229	1	Chemistry	Secondary
233	3	Biology	Secondary
255	1	Language Arts	Secondary
256	1	English	Secondary
257	3	Social Studies	Secondary
261	1	English	Secondary
303	1	English	Secondary
319	3	Special Education	Secondary
322	1	English	Secondary
331	3	Language Arts	Secondary
361	9	Home Economics	Secondary
363	1	Speech	1-12
364	1	Social Studies	Secondary
373	3	Elementary	Elementary
375	3	English	Secondary
440	1	Social Studies	Secondary
447	3	Business	Secondary
453	1	Foreign Language	Secondary
456	3	Mathematics	Secondary
461	5	Art	1-12
471	1	English	Secondary
472	1	Languages	Secondary
476	1	Letters	Secondary
501	5	Vocal Music	1-12
504	1	Mathematics	Secondary
506	5	Art	1-12

TABLE 17--Continued

Subjects	College To Which Assigned	Major Teaching Field	Certification Level
517	1	English	Secondary
518	1	Speech	1-12
519	3	Business	Secondary
532	3	Elementary	Elementary
541	1	Physical Education	1-12
549	5	Vocal Music	1-12
602	1	Foreign Language	Secondary
606	1	Mathematics	Secondary
609	1	Psychology	Secondary
611	3	Social Studies	Secondary
628	1	English	Secondary
640	3	Language Arts	Secondary
644	3	Social Studies	Secondary
650	9	English	Secondary
659	3	Foreign Language	Secondary

TABLE 18

DATA ON THE CLASSIFICATION OF CERTAIN CHARACTERISTICS OF MEDIUM-SCHOLASTIC APTITUDE STUDENTS INTO CATEGORIES

Subjects	Occupational Group of Parent	Educational Level of Mother	Educational Level of Father
4	2	14	15
19	1	14	AB
20	1	14	LLB
27	1	12	MS
35	4	8	12
52	1	14	14
55	1	AB	LLB
57	5	12	12
77	1	12	12
83	1	14	BS
85	1	12	13
94	5	11	12
101	2	12	15
103	1	12	12
112	1	12	12
125	5	13	12
129	1	12	12
155	1	14	AB
164	1	15	14
165	1	14	14
181	7	10	10
205	5	MA	12
214	1	14	14
216	5	12	12
219	5	15	11
234	5	12	12
249	1	14	12
258	5	12	14
260	5	12	12
264	1	AB	AM
301	1	14	15
305	1	14	AB
346	2	MEd	14
365	4	11	9
374	2	AB	10
381	2	14	12
413	5	12	8
415	1	AB	MA
420	2	13	13

TABLE 18--Continued

Subjects	Occupational Group of Parent	Educational Level of Mother	Educational Level of Father
432	5	12	8
441	2	14	AB
442	1	14	AB
469	1	MS	AB
505	1	12	DDS
514	1	12	12
525	1	13	MS
526	1	12	14
533	1	11	13
534	1	12	BS
551	1	14	BS
566	1	AB	14
568	1	AB	LLB
574	1	13	BBA
574	1	AB	BS
579	1	14	14
588	2	11	12
589	2	12	12
597	1	AB	EdD
605	1	12	12
614	4	AB+	MA+
616	1	AB	MA+
617	2	BS	DVM
618	1	RN	BS+
633	2	AB	14
647	1	8	BS
660	1	12	12

TABLE 18--Continued

Subjects	College To Which Assigned	Major Teaching Field	Certification Level
4	3	Elementary	Elementary
19	3	Elementary	Elementary
20	1	History	Secondary
27	9	Speech	1-12
35	9	Elementary	Elementary
52	3	Business	Secondary
55	3	Elementary	Elementary
57	3	Social Studies	Secondary
77	1	Home Economics	Secondary
83	3	Elementary	Elementary
85	3	Elementary	Elementary
94	3	Elementary	Elementary
101	1	Social Studies	Secondary
103	1	Foreign Language	Secondary
112	3	Home Economics	Secondary
125	3	Elementary	Elementary
129	5	Art	1-12
155	3	Elementary	Elementary
164	3	Science	Secondary
165	9	Speech	1-12
181	3	Biology	Secondary
205	3	Language Arts	Secondary
214	3	Elementary	Elementary
216	5	Art	1-12
219	3	Business	Secondary
234	9	Elementary	Elementary
249	3	Business	Secondary
258	3	Elementary	Elementary
260	5	Theatre	Secondary
264	3	Language Arts	Secondary
301	3	Science	Secondary
305	3	Foreign Language	Secondary
346	3	Elementary	Elementary
365	3	Social Studies	Secondary
374	1	Social Studies	Secondary
381	3	Business	Secondary
413	3	Business	Secondary
415	3	Special Education	1-12
420	1	History	Secondary
432	9	Industrial Arts	Secondary
441	3	Elementary	Elementary
442	9	Business	Secondary

TABLE 18--Continued

Subjects	College To Which Assigned	Major Teaching Field	Certification Level
469	5	Instrumental Music	Secondary
505	3	Social Studies	Secondary
514	3	Elementary	Elementary
525	3	Elementary	Elementary
526	3	Elementary	Elementary
533	3	Business	Secondary
534	3	Business	Secondary
551	1	English	Secondary
566	5	Instrumental Music	Secondary
568	3	Elementary	Elementary
574	3	Elementary	Elementary
575	1	Speech	Secondary
579	5	Drama	Secondary
588	3	Physical Education	Secondary
589	3	Business	Secondary
597	3	Mathematics	Secondary
605	1	Foreign Language	Secondary
614	1	Home Economics	Secondary
616	1	English	Secondary
617	3	Speech	Secondary
618	3	Business	Secondary
633	3	Special Education	1-12
647	3	English	Secondary
660	3	Elementary	Elementary

TABLE 19

DATA ON THE CLASSIFICATION OF CERTAIN CHARACTERISTICS OF LOW-SCHOLASTIC APTITUDE STUDENTS INTO CATEGORIES

Subjects	Occupational Group of Parent	Educational Level of Mother	Educational Level of Father
1	5	13	12
10	1	AB	14
11	1	12	14
17	2	14	14
28	2	12	12
33	1	MA	MA
36	2	12	12
43	1	14	MD
49	5	11	8
50	1	12	12
61	5	12	12
64	1	12	13
71	1	12	12
80	1	11	8
87	4	13	12
95	3	BS	13
113	5	12	13
115	5	12	11
117	1	MA	AB
120	6	10	13
132	1	15	12
140	5	12	8
153	1	15	AB
154	2	12	12
159	5	7	4
172	4	12	12
175	1	14	7
185	1	14	13
187	1	MA	AB
189	1	AB	15
193	1	13	12
197	1	14	AB
211	1	BS	LLB
224	1	AB	AB
236	5	12	8
241	1	14	12
242	1	12	AB+
243	1	11	10

TABLE 19--Continued

Subjects	Occupational Group of Parent	Educational Level of Mother	Educational Level of Father
253	5	13	13
272	4	MA	MA
275	1	MA	LLB
306	1	MMus	AB
317	1	14	14
320	1	14	15
342	5	11	12
376	1	12	AB
393	7	10	10
395	1	12	12
397	1	MA	PhD
410	1	AB	AB
421	5	MEd	12
445	6	11	8
454	4	8	14
466	1	12	14
473	6	12	14
521	1	12	14
523	4	RN	12
528	2	12	12
544	6	8	7
545	5	14	8
547	1	13	12
548	5	12	12
550	1	AB	AB
558	1	AB	12
586	1	15	AB
587	2	12	12
604	3	12	12
607	1	12	10
620	4	12	12
624	1	13	BS
651	2	12	12
656	1	AB	LLB
657	1	15	15
661	2	12	12
670	1	12	14

TABLE 19--Continued

Subjects	College To Which Assigned	Major Teaching Field	Certification Level
1	3	Elementary	Elementary
10	3	Elementary	Elementary
11	5	Art	Secondary
17	5	Music	Secondary
28	3	Elementary	Elementary
33	3	Business	Secondary
36	3	Elementary	Elementary
43	9	Social Studies	Secondary
49	9	Social Studies	Secondary
50	3	Elementary	Elementary
61	3	Elementary	Elementary
64	3	Business	Secondary
71	3	Language Arts	Secondary
80	3	Science	Secondary
87	9	Business	Secondary
95	3	Elementary	Elementary
113	9	Social Studies	Secondary
115	9	Science	Secondary
117	3	Business	Secondary
120	3	Science	Secondary
132	9	Biology	Secondary
140	3	Industrial Arts	Secondary
153	3	Industrial Arts	Secondary
154	1	History	Secondary
159	9	Elementary	Elementary
172	9	Business	Secondary
175	3	Social Studies	Secondary
185	3	Language Arts	Secondary
187	1	History	Secondary
189	3	Industrial Arts	Secondary
193	3	Business	Secondary
197	1	History	Secondary
211	1	Home Economics	Secondary
224	3	Business	Secondary
236	9	Physical Education	Secondary
241	9	Elementary	Elementary
242	3	Social Studies	Secondary
243	3	Language Arts	Secondary
253	9	Foreign Language	Secondary
272	9	Physical Education	Secondary
275	9	Drama	Secondary
306	1	Foreign Language	Secondary

TABLE 19--Continued

Subjects	College To Which Assigned	Major Teaching Field	Certification Level
317	3	Business	Secondary
320	5	Art	1-12
342	3	Elementary	Elementary
376	3	Business	Secondary
393	3	Physical Education	Secondary
395	3	Business	Secondary
397	1	Home Economics	Secondary
410	3	Special Education	1-12
421	3	Elementary	Elementary
445	3	Industrial Arts	Secondary
454	3	Industrial Arts	Secondary
466	3	Physical Education	Secondary
473	9	Home Economics	Secondary
521	3	Elementary	Elementary
523	3	Elementary	Elementary
528	3	Physical Education	Secondary
544	5	Instrumental Music	Secondary
545	3	Science	Secondary
547	9	Social Science	Secondary
548	3	Elementary	Elementary
550	3	Elementary	Elementary
558	3	Business	Secondary
586	3	Business	Secondary
587	3	Language Arts	Secondary
604	3	Elementary	Elementary
607	3	Elementary	Elementary
620	3	Social Studies	Secondary
624	3	Special Education	1-12
651	1	Social Studies	Secondary
656	3	Social Studies	Secondary
657	3	Biology	Secondary
661	3	Foreign Language	Secondary
670	3	Business	Secondary

TABLE 20

DATA ON OKLAHOMA HIGH SCHOOLS FROM WHICH HIGH-SCHOLASTIC APTITUDE SUBJECTS GRADUATED

Subjects	Size of Senior Class	Accredited by North Central Association	Proportion of Teachers with Masters	Educational Level of Principal
56	272	X	.43	Masters
67	78	X	.39	Masters
76	207	X	.51	Masters
98	424	X	.52	Masters
106	71	X	.39	Masters
116	424	X	.52	Masters
127	171	X	.40	Masters
128	278	X	.54	Masters
139	591	X	.49	Masters
147	20	X	.12	Bachelors
182	185	X	.44	Masters
199	357	X	.55	Masters
204	234	X	.39	Masters
207	207	X	.51	Masters
217	234	X	.39	Masters
220	58	X	.55	Masters
229	532	X	.53	Doctors
233	299	X	.47	Masters
255	297	X	.44	Masters
256	318	X	.59	Masters
257	272	X	.43	Masters
261	332	X	.47	Masters
303	718	X	.69	Doctors
319	424	X	.52	Masters
322	311	X	.56	Masters
331	315	X	.64	Masters
361	16		.30	Masters
363	532	X	.53	Doctors
364	40		.42	Masters
373	946	X	.78	Masters
375	230	X	.58	Masters
440	72	X	.65	Masters
447	230	X	.58	Masters
453	39	X	.42	Masters
456	68	X	.22	Masters
461	163	X	.62	Masters
471	230	X	.58	Masters
472	946	X	.78	Masters

TABLE 20--Continued

Subjects	Size Senior Class	Accredited by North Central Association	Proportion of Teachers with Masters	Educational Level of Principal
476	591	X	.49	Masters
501	184	X	.62	Masters
504	591	X	.49	Masters
506	230	X	.59	Masters
517	93	X	.35	Masters
518	177	X	.50	Doctors
519	532	X	.53	Doctors
532	396	X	.50	Masters
541	206	X	.30	Masters
549	181	X	.32	Masters
602	92	X	.26	Masters
606	181	X	.32	Masters
609	629	X	.54	Masters
611	215	X	.49	Masters
628	206	X	.30	Masters
640	172	-	.43	Masters
644	17		.14	Bachelors
650	92	X	.26	Masters
659	591	X	.49	Masters

TABLE 21

DATA ON OKLAHOMA HIGH SCHOOLS FROM WHICH MEDIUM-SCHOLASTIC APTITUDE SUBJECTS GRADUATED

Subjects	Size of Senior Class	Accredited by North Central Association	Proportion of Teachers with Masters	Educational Level of Principal
4	151	X	.46	Masters
19	197	X	.36	Masters
20	421	X	.47	Masters
27	230	X	.54	Masters
35	13		.24	Masters
52	287	X	.41	Masters
55	234	X	.39	Masters
57	85	X	.56	Masters
77	184	X	.62	Masters
83	404	X	.60	Masters
85	76	X	.50	Masters
94	76	X	.50	Masters
101	239	X	.58	Masters
103	239	X	.58	Masters
112	26		.11	Bachelors
125	214	X	.41	Masters
129	230	X	.58	Masters
155	272	X	.43	Masters
164	74	X	.61	Masters
165	75	X	.30	Masters
181	814	X	.65	Doctors
205	155	X	.71	Masters
214	91	X	.35	Masters
216	532	X	.53	Doctors
219	315	X	.64	Masters
234	197	X	.36	Masters
249	239	X	.58	Masters
258	299	X	.47	Masters
260	814	X	.65	Doctors
264	29	X	.31	Masters
301	137	X	.48	Masters
305	230	X	.58	Masters
346	126	X	.75	Masters
365	26		.30	Bachelors
374	51	X	.31	Masters
381	237		.41	Masters
413	532	X	.53	Doctors
415	53		.67	Masters

TABLE 21--Continued

Subjects	Size of Senior Class	Accredited by North Central Association	Proportion of Teachers with Masters	Educational Level of Principal
420	396	X	.50	Masters
432	34		.31	Masters
441	318	X	.59	Masters
442	396	X	.50	Masters
469	56	X	.58	Masters
505	25	X	.27	Masters
514	234	X	.39	Masters
525	230	X	.58	Masters
526	92	X	.26	Masters
533	378	X	.58	Masters
534	184	X	.62	Masters
551	208	X	.45	Masters
566	309	X	.66	Masters
568	282	X	.62	Masters
574	396	X	.50	Masters
575	342	X	.54	Masters
579	215	X	.49	Masters
588	332	X	.47	Masters
589	718	X	.69	Doctors
597	84	X	.67	Masters
605	718	X	.69	Doctors
614	184	X	.62	Masters
616	237		.41	Masters
617	14		.25	Bachelors
618	721	X	.72	Doctors
633	718	X	.69	Doctors
647	206	X	.30	Masters
660	230	X	.58	Masters

TABLE 22

DATA ON OKLAHOMA HIGH SCHOOLS FROM WHICH LOW-SCHOLASTIC APTITUDE SUBJECTS GRADUATED

Subjects	Size of Senior Class	Accredited by North Central Association	Proportion of Teachers with Masters	Educational Level of Principal
1	287	X	.41	Masters
10	234	X	.39	Masters
11	60	X	.57	Masters
17	814	X	.65	Doctors
28	214	X	.41	Masters
33	12		.22	Masters
36	234	X	.39	Masters
43	24		.33	Bachelors
49	235	X	.41	Masters
50	239	X	.58	Masters
61	297	X	.44	Masters
64	22		.20	Bachelors
71	409	X	.44	Doctors
80	21		.25	Bachelors
87	12		.20	Bachelors
95	115	X	.15	Masters
113	215	X	.78	Masters
115	58	X	.47	Masters
117	121	X	.75	Masters
120	85	X	.56	Masters
132	70	X	.33	Masters
140	230	X	.58	Masters
153	65	X	.53	Masters
154	278	X	.54	Masters
159	239	X	.58	Masters
172	9		.50	Bachelors
175	933	X	.75	Masters
185	234	X	.39	Masters
187	113	X	.72	Masters
189	387	X	.57	Masters
193	237		.41	Masters
197	421	X	.47	Masters
211	83	X	.47	Masters
224	163	X	.62	Masters
236	200	X	.52	Doctors
241	814	X	.65	Doctors
242	214	X	.41	Masters
243	79	X	.60	Masters
253	22		.38	Masters

TABLE 22--Continued

Subjects	Size of Senior Class	Accredited by North Central Association	Proportion of Teachers with Masters	Educational Level of Principal
272	116	X	.54	Masters
275	282	X	.62	Masters
306	230	X	.58	Masters
317	269	X	.48	Doctors
320	99	X	.67	Masters
342	33	X	.23	Masters
376	26	X	.36	Masters
393	29	X	.27	Masters
395	184	X	.62	Masters
397	230	X	.58	Masters
410	230	X	.58	Masters
421	32		.31	Masters
445	15		.33	Masters
454	13		.33	Masters
466	83	X	.75	Masters
473	19		.33	Bachelors
521	65	X	.36	Masters
523	35	X	.25	Masters
528	177	X	.50	Doctors
544	181	X	.32	Masters
545	495	X	.77	Doctors
547	42		.38	Masters
548	107	X	.75	Masters
550	230	X	.58	Masters
558	14		.14	Bachelors
586	933	X	.75	Masters
587	591	X	.49	Masters
604	230	X	.58	Masters
607	532	X	.53	Doctors
620	47	X	.29	Masters
624	396	X	.50	Masters
651	503	X	.47	Doctors
656	148	X	.43	Masters
657	310	X	.50	Masters
661	163	X	.62	Masters
670	313	X	.54	Masters

TABLE 23

DATA FOR STUDENTS ENROLLED IN EDUCATION 52

Subjects*	Freshman Grade Point Average	Concept Mastery Test	Course Grade
1	1.84	42	B
3	2.25	33	B
4	3.07	43	B
10	2.11	38	B
11	2.53	48	C
17	2.07	40	B
19	2.77	50	B
20	3.27	50	B
25	1.96	28	B
27	1.84	39	C
28	2.25	42	C
31	3.30	58	A
33	2.21	48	B
35	1.65	39	C
36	2.50	29	B
41	2.87	48	A
43	1.13	44	C
47	1.20	54	B
49	1.58	34	B
50	2.10	37	B
52	2.37	36	B
53	2.08	45	C+
55	3.18	61	B
56	3.80	48	A
57	2.25	52	C
61	2.93	45	B
64	1.65	37	C
67	3.73	58	A
71	2.17	43	B
76	2.30	47	B
77	2.30	57	A
80	2.57	44	C
83	3.03	49	B
85	2.32	55	B
87	1.28	48	C+
88	2.11	46	C+
94	3.00	49	B
95	2.41	38	C
98	2.96	41	C

TABLE 23--Continued

Subjects*	Freshman Grade Point Average	Concept Mastery Test	Course Grade
101	2.23	55	C
103	3.87	50	B
105	2.70	45	C
106	3.50	60	B
111	1.36	32	F
112	3.09	52	C
113	1.70	34	F
115	2.07	50	C
116	3.56	68	B
117	2.43	45	C
120	2.17	49	C
125	2.63	54	C
127	3.05	49	C
128	2.76	54	C
129	1.88	50	D
130	2.60	43	C
132	2.34	41	C
139	2.60	60	B
140	2.00	36	C
147	3.57	55	A
153	2.12	47	C
154	3.00	49	B
155	2.56	38	D
159	1.93	31	C
163	2.48	45	D
164	2.00	51	B
165	2.23	37	C
170	3.10	48	C
172	1.50	40	D
175	1.96	35	C
181	2.13	53	F
182	2.89	56	B
185	2.08	31	C
187	2.74	50	B
189	2.00	54	C
193	2.24	34	C
197	2.64	43	B
199	3.31	54	B
200	1.45	55	C
204	3.56	46	B
205	2.02	32	B
207	3.84	59	B

TABLE 23--Continued

Subjects*	Freshman Grade Point Average	Concept Mastery Test	Course Grade
211	2.43	43	C
214	2.44	48	C
216	1.96	46	B
217	3.16	49	A
219	2.41	42	B
220	3.62	61	B
224	2.35	39	B
226	1.06	31	C
227	3.40	52	B
229	3.38	50	B
230	3.06	49	B
233	2.68	60	B
234	1.85	37	B
236	1.50	40	B
241	2.32	47	C
242	2.33	39	C
243	2.10	41	B
249	2.50	57	B
253	1.71	45	C
255	2.75	50	B
256	2.53	46	B
257	3.03	55	B
258	2.83	50	B
259	2.73	60	B
260	2.03	40	F
261	3.96	62	A
264	2.74	41	B
268	2.84	50	B
272	.80	38	F
274	2.28	42	B
275	1.51	25	C
Means	2.45	46.01	
S.D.'s	.66	8.49	

*Identification numbers of subjects are not consecutive because subjects represent a select sample from 632 students used in Research Project #73403100.

TABLE 24

DATA FOR STUDENTS ENROLLED IN EDUCATION 151

Subjects	Freshman Grade Point Average	Concept Mastery Test	Course Grade
301	3.21	50	C
303	2.64	57	C
304	2.76	48	B
305	2.48	57	B
306	2.71	40	C
307	3.17	56	C
316	2.93	53	B
317	2.25	36	C
319	2.86	55	A
320	2.64	35	C
322	2.46	43	C
324	3.20	48	B
331	3.73	53	A
342	2.86	46	C
346	3.13	55	A
347	3.22	51	C
352	2.23	48	C
361	2.33	49	C
363	2.92	47	B
364	2.78	52	B
365	2.88	57	B
368	3.53	41	B
369	2.70	45	C
370	2.23	32	B
373	2.13	45	C
374	3.57	41	B
375	2.56	53	B
376	2.20	47	B-
381	2.51	44	D
393	2.16	48	B
395	2.03	33	C
397	2.82	44	B
410	2.48	49	C
411	2.00	54	C
413	2.11	47	C
415	3.38	45	B
420	2.83	45	C+
421	2.61	55	B+
422	2.25	41	C+
430	2.76	57	B+

TABLE 24--Continued

Subjects	Freshman Grade Point Average	Concept Mastery Test	Course Grade
432	1.85	47	C
440	3.23	58	B+
441	2.50	57	A-
442	1.62	51	D
445	2.17	37	B
447	2.73	44	C
453	3.08	53	B
454	1.52	48	D-
456	2.03	59	C
461	3.85	56	B
466	1.96	49	B-
468	2.54	49	B-
469	2.54	28	D
471	3.45	48	C
472	4.00	61	A
473	1.48	49	B
476	3.50	50	B
Means	2.67	48.18	
S.D.'s	.57	7.13	

TABLE 25

DATA FOR STUDENTS ENROLLED IN EDUCATION 222

Subjects	Freshman Grade Point Average	Concept Mastery Test	Course Grade
501	3.48	49	C+
504	2.62	57	D+
505	2.93	45	B-
506	2.75	59	C
507	2.09	54	D+
513	2.23	46	B-
514	2.80	46	C-
517	2.83	53	C
518	3.22	47	C-
519	2.73	39	C
521	2.13	52	C+
522	3.17	48	C
523	2.80	39	D+
525	3.43	52	A-
526	2.44	39	C-
528	2.48	43	C
531	2.62	53	C+
532	3.57	48	B-
533	2.20	49	C-
534	2.41	39	C-
537	3.12	49	B-
541	3.09	62	B-
542	2.70	45	B-
544	3.19	48	C
545	2.20	49	C-
547	1.12	31	D+
548	2.13	40	C-
549	2.96	57	B
550	3.16	45	C
551	2.33	50	B-
554	2.78	43	C-
557	2.67	45	C-
558	2.13	46	C+
559	1.70	52	C-
561	2.54	48	C+
562	3.40	50	B-
566	3.00	45	C+
568	2.43	47	B-
574	3.86	42	A-

TABLE 25--Continued

Subjects	Freshman Grade Point Average	Concept Mastery Test	Course Grade
575	2.63	49	C
576	2.72	48	C
579	2.45	46	C+
582	3.35	54	B
586	1.88	45	D
587	2.07	40	B
588	1.46	49	C
589	2.28	38	C
597	1.81	46	C
602	3.54	54	B
604	2.16	40	C
605	2.70	43	A
606	2.87	60	A
607	2.47	51	C
609	2.53	60	B
611	3.64	56	B
614	2.83	57	A
616	2.53	53	B
617	2.66	53	B
618	3.29	52	B
620	1.75	42	D
624	1.51	44	C
628	2.84	56	B
633	2.55	44	C
640	2.28	56	A
644	3.44	60	B
647	2.03	41	B
650	3.50	64	B
651	1.89	54	C
655	3.36	43	B
656	1.44	40	C
657	2.42	41	B
659	2.33	50	B
660	2.19	51	B
661	1.55	38	C
670	1.51	51	C
Means	2.59	48.27	
S.D.'s	.60	6.57	

APPENDIX B

TABLE 26

APPLICATION OF F TESTS FOR HOMOGENEITY OF VARIANCE FOR SCHOLASTIC APTITUDE GROUPS RELATIVE TO CERTAIN CHARACTERISTICS

Areas	Variances for Scholastic Aptitude Groups			F
	High (N=57)	Medium (N=66)	Low (N=75)	
Reading Comprehension	20.787	18.522		1.12
	20.787		19.920	1.04
		18.522	19.920	1.08
English	29.117	46.561		1.60*
	29.117		44.863	1.54*
		46.561	44.863	1.04
Mathematics	87.723	76.784		1.14
	87.723		62.143	1.41
		76.784	62.143	1.24
Science	85.596	50.274		1.70*
	85.596		62.937	1.36
		50.274	62.937	1.25
History	65.717	46.043		1.43
	65.717		53.101	1.24
		46.043	53.101	1.15
Freshman Grade Point Average	.246	.280		1.14
	.246		.231	1.06
		.280	.231	1.21
Social Class Identification	10.960	29.114		2.66**
	10.960		22.057	2.01**
		29.114	22.057	1.32

TABLE 26--Continued

Areas	Variances for Scholastic Aptitude Groups			
	High (N=57)	Medium (N=66)	Low (N=75)	F
Attitude	56.225	65.508		1.16
Towards	56.225		53.215	1.06
Teaching		65.508	53.215	1.23

**Significant at the .01 level.
*Significant at the .05 level.

APPENDIX C

TABLE 27

MATRIX OF INTERCORRELATIONS BETWEEN CRITERION AND PREDICTOR VARIABLES FOR EDUCATION 52, N = 113

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	
1.00	.595	.587	.520	.508	.564	.728	.330	-.055	X_1
	1.00	.860	.687	.557	.605	.777	.112	-.009	X_2
		1.00	.532	.514	.603	.729	.124	-.117	X_3
			1.00	.655	.557	.704	.171	.098	X_4
				1.00	.474	.581	.076	.032	X_5
					1.00	.528	.135	.169	X_6
						1.00	.217	.052	X_7
							1.00	.091	X_8
								1.00	X_9

X_1 Concept Mastery Test
X_2 OSPE Total
X_3 OSPE Reading Comprehension
X_4 IHSC English
X_5 IHSC History
X_6 Freshman Grade Point Average
X_7 SCAT Verbal
X_8 MTAI Attitude Towards Teaching
X_9 SIMS Social Class Identification

TABLE 28

MATRIX OF INTERCORRELATIONS BETWEEN CRITERION AND PREDICTOR VARIABLES FOR EDUCATION 151, N = 57

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	
1.00	.391	.482	.373	.379	.248	.450	.319	-.167	X_1
	1.00	.854	.675	.553	.467	.873	.388	-.035	X_2
		1.00	.663	.539	.465	.800	.281	-.015	X_3
			1.00	.600	.600	.643	.222	.124	X_4
				1.00	.451	.523	-.004	-.138	X_5
					1.00	.466	.161	.122	X_6
						1.00	.317	-.126	X_7
							1.00	.007	X_8
								1.00	X_9

X_1 Concept Mastery Test
X_2 OSPE Total
X_3 OSPE Reading Comprehension
X_4 IHSC English
X_5 IHSC History
X_6 Freshman Grade Point Average
X_7 SCAT Verbal
X_8 MTAI Attitude Towards Teaching
X_9 SIMS Social Class Identification

TABLE 29

MATRIX OF INTERCORRELATIONS BETWEEN CRITERION AND PREDICTOR VARIABLES FOR EDUCATION 222, N = 75

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	
1.00	.611	.578	.456	.458	.379	.688	.455	-.033	X_1
	1.00	.911	.656	.445	.574	.795	.375	.132	X_2
		1.00	.591	.400	.554	.746	.359	.053	X_3
			1.00	.548	.491	.635	.298	.169	X_4
				1.00	.452	.617	.210	.099	X_5
					1.00	.660	.301	.266	X_6
						1.00	.433	.158	X_7
							1.00	.187	X_8
								1.00	X_9

X_1 Concept Mastery Test
X_2 OSPE Total
X_3 OSPE Reading Comprehension
X_4 IHSC English
X_5 IHSC History
X_6 Freshman Grade Point Average
X_7 SCAT Verbal
X_8 MTAI Attitude Towards Teaching
X_9 SIMS Social Class Identification

TABLE 30

BETA COEFFICIENTS, b-COEFFICIENTS, AND CONSTANTS (a)

Variables	Education 52	Education 151	Education 222
		Beta Coefficients	
X_2	.018	-.548	.195
X_3	-.091	.484	.000
X_4	-.151	.068	-.022
X_5	.133	.231	.103
X_6	.306	-.032	-.117
X_7	.614	.283	.490
X_8	.195	.298	.218
X_9	-.156	-.117	-.152
		b-Coefficients	
X_2	.018	-.510	.155
X_3	-.091	.460	.000
X_4	-.139	.064	-.017
X_5	.126	.206	.079
X_6	3.927	-.398	-1.288
X_7	.628	.237	.348
X_8	.227	.340	.160
X_9	-.287	-.186	-.187
		Constant (a)	
	7.8212	17.424	20.292

TABLE 31

PARTIAL CORRELATION COEFFICIENTS

Coefficients	Education 52	Education 151	Education 222
$r_{12 \cdot 3456789}$	.013	-.258	.104
$r_{13 \cdot 2456789}$	-.067	.288	.000
$r_{14 \cdot 2356789}$	-.143	.052	-.023
$r_{15 \cdot 2346789}$	.157	.203	.113
$r_{16 \cdot 2345789}$	.343	-.031	-.125
$r_{17 \cdot 2345689}$	.488	.160	.335
$r_{18 \cdot 2345679}$	.298	.312	.279
$r_{19 \cdot 2345678}$	-.235	-.134	-.208

TABLE 32

"t" RATIOS OF PARTIAL CORRELATION COEFFICIENTS BETWEEN CRITERION AND EIGHT INDEPENDENT VARIABLES

Coefficients	Education 52	Education 151	Education 222
$r_{12 \cdot 3456789}$	.133	1.852	.849
$r_{13 \cdot 2456789}$	.684	2.084*	.000
$r_{14 \cdot 2356789}$	1.474	.361	.187
$r_{15 \cdot 2346789}$	1.619	1.436	.922
$r_{16 \cdot 2345789}$	3.720**	.215	1.024
$r_{17 \cdot 2345689}$	5.714**	1.123	2.883**
$r_{18 \cdot 2345679}$	3.177**	2.276*	2.358*
$r_{19 \cdot 2345678}$	2.463*	.936	1.728

**Significant at the .01 level.
*Significant at the .05 level.

APPENDIX D

FORMULAE USED IN COMPUTING TESTS OF SIGNIFICANCE

Formula 1 (Chi-square test):

$$\chi^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right]$$

where:

f_o = observed frequency

f_e = expected frequency

Formula 2 (F test for homogeneity of variance):

$$F = \frac{\text{larger variance}}{\text{smaller variance}}$$

Formula 3 ("t" test used when variances are homogeneous and the number of cases in the two samples are unequal):

$$t = \frac{M_1 - M_2}{\sqrt{\left(\frac{\Sigma x^2_1 + \Sigma x^2_2}{N_1 + N_2 - 2} \right) \left(\frac{N_1 + N_2}{N_1 N_2} \right)}}$$

where:

M_1 and M_2 = means of the two samples

x^2_1 and x^2_2 = sums of squares of the two samples

N_1 and N_2 = numbers of cases in the two samples

Formula 4 ("t" test used when variances are heterogeneous):

$$t = \frac{M_1 - M_2}{\sqrt{\frac{s^2_1}{N_1} + \frac{s^2_2}{N_2}}}$$

where:

M_2 and M_2 = means of the two samples

s^2_1 and s^2_2 = variances of the two samples

N_1 and N_2 = numbers of cases in the two samples

Formula 5 (used to determine criterion "t" when obtained value of "t" and table value of "t" are very close):

$$t_{.01} = \frac{(s_{\bar{X}_1}^2)(t_1) + (s_{\bar{X}_2}^2)(t_2)}{s_{\bar{X}_1}^2 + s_{\bar{X}_2}^2}$$

where:

$s_{\bar{X}_1}^2$ and $s_{\bar{X}_2}^2$ = squares of the standard error of the mean for each sample

t_1 and t_2 = table values for each sample for the corresponding degrees of freedom

Formula 6 (a Pearson r computed from original data for zero order correlations):

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

where:

r_{xy} = the correlation coefficient between X and Y

ΣXY = sum of the products of X and Y

Formula 7 (standard error of a Pearson product-moment coefficient of correlation):

$$\sigma_r = \frac{1 - r^2}{\sqrt{N - 1}}$$

Formula 8 ("t" ratio for testing the significance of a coefficient of correlation):

$$t = r \sqrt{\frac{N - 2}{1 - r^2}}$$

where:

r^2 = the square of the coefficient of correlation

N = the number of cases

Formula 9 ("t" ratio for testing the significance of a partial coefficient of correlation):

$$t = \frac{r_{12 \cdot 3 \ldots k}}{\sqrt{\frac{1 - r^2_{12 \cdot 3 \ldots k}}{N - k}}}$$

where:

df = N - k, an additional degree of freedom is lost for each additional variable eliminated

Formula 10 (constant in a multiple regression equation):

$$a = M_1 - b_{12}M_2 - b_{13}M_3 - b_{14}M_4 - \ldots$$

where:

b_{12}, b_{13}, b_{14} = b-coefficients for each variable used

M_2, M_3, M_4 = the corresponding means of each variable used

Formula 11 (multiple regression equation):

$$X_1 = a + b_2X_2 + b_3X_3 + \ldots b_mX_m$$

where:

X_1 = the dependent variable

$X_2, X_3, \ldots X_m$ = the several independent variables used

Formula 12 (beta coefficients computed from b-coefficients):

$$\beta_{12\cdot34} = b_{12\cdot34} \frac{s_2}{s_1}$$

Formula 13 (solution of multiple correlation from beta coefficients):

$$R^2 = \beta_{12}r_{12} + \beta_{13}r_{13} + \beta_{14}r_{14} + \beta_{15}r_{15} + \ldots$$

where:

R = the square root of R^2

Formula 14 (standard error of a multiple correlation involving n variables):

$$\sigma_{r_{1\cdot23\ldots n}} = \frac{1 - r^2_{1\cdot23\ldots n}}{\sqrt{N}}$$

where:

$r^2_{1\cdot23\ldots n}$ = the coefficient of multiple determination, or the square of the multiple correlation

n = the number of variables

N = the number of cases