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Prediction of Academic Success in the College of Forestry

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PREDICTION OF ACADEMIC SUCCESS IN THE

COLLEGE OF FORESTRY

by

Ronald Skeen Peterson

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Ronald Skeen Peterson

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CHAPTER I

THE NATURE OF THE STUDY

Background of the Problem

The College of Forest, Range and Wildlife Management (hereafter referred to as the College of Forestry) at Utah State University has been concerned for some time with the problem of selecting from the applicants to their school the ones whom they think will be able to complete the requirements for graduation. The large number of freshman students placed on probation at the end of the fall quarter and of succeeding quarters each year gives some idea of the magnitude of the problem. It is not unusual for 40 or 50 percent of the entering freshmen to be in this category.

The faculty of the College of Forestry is interested in the students, not only as potential professional foresters, but also as individuals. They recognize the fact that failure is not only emotionally upsetting but also expensive, especially for students who have come, as many of them have, from out of state. The loss of time and money on the part of the students, as well as the effort expended by the professors, is a waste of human resources.

Because of their desire to give each student as much opportunity as possible to succeed, the College of Forestry has devised a very elaborate probation program.[1] If the student fails to maintain a

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[1]See Appendix A for copy of scholarship policy of the College of Forest, Range and Wildlife Management.

2.0 (C average) for two consecutive quarters, he is asked to sign a statement indicating that if he is unable to get satisfactory grades the next quarter he will withdraw from school and not register again for two quarters. This provides the student with a "cooling off period" during which he can re-evaluate his goals in terms of his past performance in school.

In addition to the students who are not successful in the coursework, there are also some students who transfer to other schools on the campus or to other universities because of changes in vocational interests. The percentage of freshmen who finally graduate from the College of Forestry is comparatively small. For example, only 14.7 percent of the 75 freshmen who entered in 1954 graduated with the 55 members of the Class of 1958.[1] The remainder of the graduating class were students who transferred here from other colleges, junior colleges, or universities. These statistics have been so revealing that the faculty of the College of Forestry have contemplated discontinuing their lower division classes and developing a recruiting program that would supply them with students who would start upper division work in forestry after completion of lower division courses elsewhere.

This information has also prompted the faculty to question the methods of student selection. At present, the applicant's admission to the College of Forestry is based on (a) high school grade point average in English, mathematics, chemistry, and physics, and (b) the

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[1] Of 13,000 freshman entrants to 101 engineering colleges in 1949, 56 percent withdrew or were dropped during the next four years. Johnson, P.A. "Graduation, holdback, and withdrawal rates in engineering Colleges" Journal of Engineering Education. 45:270-273, 1954

committee's over-all impression of the general information supplied by the applicant. However, there has been no quantification of any kind, and comparatively little use has been made of the background data that are supplied on the application form used by the University for admission purposes.

Statement of the Problem

The purpose of this study was twofold: (a) to evaluate the present method of selecting students for admission to the College of Forestry and (b) to consider other predictive instruments that may be of value in selecting qualified applicants.

In making this evaluation the following hypotheses were tested:

1. The total high school grade point average is as effective in predicting college success as is the grade point average for English, mathematics, chemistry and physics, the courses used now for selective admission.

2. There is a positive correlation between the School and College Ability Test and academic success, as indicated by over-all college grade-point average.

3. In predicting academic success, the scores on School and College Ability Test and the Cooperative English Test will be more effective than the method now used by the College of Forestry.

4. There is a significant difference in background variables of successful and non-successful students.

Justification for the Study

In an attempt to help the College of Forestry identify a higher

percentage of applicants who will be successful in their school, it was decided to evaluate the information that is already available before attempting to devise or determine other means of prediction. The School and College Ability Test and the Cooperative English Test are administered to all entering freshmen at Utah State University. The interpretation of these test data, however, lacks local validation. It therefore seemed appropriate to provide empirical evidence of the predictive value of these tests. It was felt that the present study might provide information that would assist the faculty of the College of Forestry and the counselors in Counseling Services in interpretating the test data.

Definition and Abbreviation of Terms

Coop. English

Coop. English refers to the Cooperative English Test, Form Z, Lower Level. This is an English Achievement test.

SCAT

This abbreviation refers to the School and College Ability Test, Form 1 A. It is a scholastic aptitude test.

CHAPTER II

SURVEY OF THE LITERATURE

Background of the Studies Surveyed

The need to be able to predict academic success has been recog-
nized by many. As Travers (17) pointed out, there are few other fields
of systematic educational investigation that have interested such varied
groups. Registrars, university examiners, organized professional groups,
school administrators, individual teachers, and numerous other groups
and individuals have devoted time to the investigation of methods for
the prediction of academic success.

Douglass (18) indicated that the problem of selecting, from those
applying for admission to colleges or universities, those students most
capable of profiting from higher education is not one of recent origin.
From the first establishment of colleges in this country various methods
have been employed as means of identifying those applicants thought to
be more promising. He stated that until the 1870's the method uniformly
employed was that of the entrance examination. The accrediting method
(admitting graduates from accredited high schools) was first employed
at the University of Michigan in 1871 and has continued as the principle
avenue of entrance to practically every state-supported institution and
to a very large majority of privately supported colleges and universi-
ties ever since.

The first attempt to establish a relationship between intelligence
(as measured by "mental tests") and college scholarship was made by
Cattell. His tests were largely measures of simple sensory capacities.

When it was discovered that they had no relationship to scholarship they were discarded as mental tests. (21)

This was only a beginning, however. It was during World War I that the Army Alpha tests were developed, and these were given extensively throughout the country during and following the war. Their results had sufficient predictive value to justify further research in this area.

The American Council on Education Psychological Examination, developed by Drs. L. L. Thurstone and Thelma Gwinn Thurstone, was first used in 1924. It has been used so widely since that time that it is better known now by its initials, "ACE", than by its full title. (40) The ACE is not what is commonly referred to as an intelligence test, but rather, a test of certain intellectual abilities that have been shown to be closely related to scholastic success. In recent years the ACE has been replaced by the School and College Ability Test used in the present study.

Since the Development of these tests other studies have encouraged continued research in prediction of academic success with different variables. Eursch and Cain (21) reported that few problems in education and psychology have received as much attention as the relationship of intelligence or scholastic aptitude tests to college scholarship.

Summary of Studies Using Similar Predictor Variables

The literature is replete with studies using the predictor variables selected for this investigation. While an attempt will be made to give a general overview of the problem, the survey will not be exhaustive.

First quarter college grade point average

The use of first quarter grades in the present study as a criterion of success seems justified in light of the many studies reporting high correlations between early college work and subsequent semesters. Studies (31, 16, 13, 2, 46, 36) investigating the relationship between first semester or quarter grades and second semester or quarter grades showed correlations ranging from .66 to .87. Travers (17) pointed out that for the prediction of second semester grades the first semester grades are by far the best criterion. This would seem to support the studies previously mentioned. Gerberich (27) concluded that differences obtained between students on the first semester grades were maintained reliably throughout their entire scholastic career.

When comparing early college work with total college scholarship, Lehman (37) obtained a correlation of .66 for first quarter point-hour ratio with final cummulative point-hour ratio. Jex (36) reported a correlation of .72 between first quarter grades and grade point average at graduation. Eursch and Cain (21) summarized a number of studies by pointing out that the accuracy of prediction can be increased if early college scholarship is used to forecast scholarship throughout the remaining years of college. For such prediction, correlations above .70 are not uncommon between scholarship during the first semester in college and scholarship over the four year period. Even these correlations account for only about 50 percent of the common variance, however.

High school indices

With very few exceptions, investigators have considered average high school grades as the best predictors of academic success in college.

Durflinger (19) reported that there appears to be sufficient basis for concluding that the correlations between college scholarship and high school marks will vary from .50 to .60 with a median of approximately .55. Travers (17) indicated that study after study has shown the average high school grade to be a better predictor of college grades than either subject matter or psychological tests. Recent studies by Jex, (36) Stone, (47) Boyd, (6) Fredrickson and Schrader, (23) Henderson and Masten, (33), and Ashmore (2) seem to verify the earlier research.

Segel (44) noticed in his summary of studies, however, that the correlations based on high school marks vary more than do those based on a scholastic aptitude test or on general intelligence tests. His review showed correlation coefficients from school to school varying from .29 to .77. He attributed this greater variability to the fact that marks given at different high schools do not have the same meaning, whereas tests given to students at different schools yield more stable values.

It is also interesting to note that Chahbazi, (9) in comparing high school average with first term grade point average in the College of Agriculture at Cornell University, reported a correlation coefficient of .37. Bertrand (3) in a study also using agricultural students, concluded that as single indicators of scholastic achievement in college, there is little difference between high school grade point average and an overall measure of aptitude. He further stated that as a single indicator of academic success, when completion of the second year is used as the achievement criterion, high school grades are only slightly more useful than are aptitude scores. These two findings have relevance for the present study inasmuch as students

in forestry and agriculture seem to have goals that are somewhat similar.

In explaining the reportedly higher predictive value of high school grades Taylor and Constance (48) concluded that high grades in high school forecast superior achievement in college because they afford evidence of well organized study habits and rather definite scholarly interests. Variations in grading practices are not so likely to be reflected in high grades as in average grades, making the former more significant in the prediction of college scholarship. Travers (17) concluded that the predictive value of school grades that are high is undoubtedly a result of the fact that they represent a combination of the ability and motivational factors operating in much the same way as they will operate in college. He further stated that, in general, correlations of high school grades and first year college grades are between .50 and .70, depending upon such circumstances as the extent to which it is possible for the college concerned to select its students.

Basic high school courses

Only a few reported studies deal directly with prediction of college success using basic high school courses such as English, mathematics, chemistry, and physics. Arnold and Schoepfle (1) found that for success in college mathematics a student should be among the top 40 percent of the entering college freshmen or among the top 22 percent of his high school senior class. They also found that most of the students who did well in high school physics did correspondingly well in college physics and that students who did poorly in mathematics were likely to encounter difficulty in physics. Hanna (30) reported a correlation coefficient of .49 between high school grades in English and college grades in English, a correlation of .35 between

high school mathematics and college mathematics and a correlations of
.51 for a general average which included English, mathematics, and
foreign languages. Pierson (42) reported that the total grade point
ratio received in high school was more indicative of general scholarship
in engineering than the results obtained through multiple regression
equation by combining the marks earned in high school English, mathe-
matics, physics and chemistry. Although the results of these studies
are not conclusive, they do suggest that basic high school courses
have about the same predictive value as the total high school grade
point average.

It is interesting to note that Douglass (18) found that zero
order correlations show no significant relationship between the amount
of credit presented in any one subject and college marks. The coeffi-
cients ranged from .07 in vocational subjects to .17 in foreign lang-
uages. A study of the partial coefficient revealed that the relation-
ships which appeared to exist are probably largely the result of the
operation of a third factor--intelligence. It is commonly believed
that the brighter and more industrious students tend to elect more work
in foreign languages and in mathematics and less in vocational subjects
than do less able and less industrious pupils. There appears to be
no appreciable relationship between subjects chosen and success in
college.

Measuring instruments

In an attempt to increase the degree to which college scholarship
can be predicted, many intelligence and aptitude tests have been de-
vised. Two that are widely used are the American Council on Education
Psychological Examination and The Cooperative English Test. As was

mentioned earlier, the American Council on Education Psychological
Examination was developed by Drs. L. L. Thurstone and Thelma Gwinn
Thurstone, and was first used in 1924. Since that time, according to
Traxler (50), upwards of 50,000 freshmen, distributed among several
hundred colleges, have contributed annually to the national norms on
this test.

The forms of the college freshmen edition, published during
the last 15 years, have contained 6 sub-tests. Three of these sub-
tests, completion, verbal analogies, and same-opposite have been com-
bined to form a linguistic score. The other three subtests, arithmetic
reasoning, figure analogies and number series, have been added together
to provide a quantitative score. The test also yields a total score.

There have been numerous studies using the ACE as a predictor
variable. The writer will attempt to present some of the more recent
findings. Fredrickson and Shrader (23) in a study made by Educational
Testing Service with the support of the Carnegie Cooperation of New
York, found a median correlation of .47 between ACE scores and college
grades for 22 sub-groups of male students. The range was .28 to .61.
They also indicated that the correlation coefficient reported was
in agreement with the observations of the Thurstones, who, in 1932,
reported that the correlations between the ACE scores and college
grades averaged around .50. Other investigators have reported cor-
relation coefficients ranging from .20 to .57, with a median of .44
(8, 24, 29, 31, 32, 33, 35, 36, 51).

It is interesting to note that most researchers (8, 10, 24, 31, 34)
have found that the linguistic score has a higher correlation with
college grades than does the quantitative score. Smith and Triggs (45)

observed that the level of linguistic skill effects the extent to which students can apply the "Q" ability and that this level varies with type of courses. There is also an indication that above a given level, "overlearning" in the verbal area may bring profitable results if reward from college work is great enough to warrant the effort.

School and College Ability Tests

The information given on the American Council on Education Psychological Examination is presented primarily as background data for the more recent aptitude test (SCAT) recently published by the Cooperative Test Division of Educational Testing Service. Traxler (50) made a careful analysis of the two tests to determine whether Educational Testing Service was justified in substituting the SCAT for the ACE. The study compared the relative difficulty and predictive value of the new Cooperative School and College Ability Test, Form 1 A, and the American Council on Education Psychological Examination, 1948 college edition. Traxler found that (a) the relative difficulty of the ACE and the SCAT according to the distribution of scores tends to be fairly normal without a large amount of piling up of the scores at either end of the scale, (b) the SCAT quantitative part is evidently a little easier for pupils than the corresponding part of the ACE, (c) the verbal part of the SCAT is somewhat more difficult than the linguistic part of the ACE and, (d) while there is some evidence that the ACE discriminates a little better at the extreme ends of the scale, for all practical purposes the two tests are virtually equal in difficulty.

In appraising the relative predictive value of the SCAT and the ACE Traxler showed that the difference between the two tests in predicting effectiveness was slight. The medians of the 108 correlations

of the tests scores and school marks were .52 for the SCAT and .48 for the ACE. Traxler concluded that the two tests are as effective in predicting school success, as indicated by marks, as are most intelligence or scholastic aptitude tests.

In summary, Traxler observed that on the basis of the data of his study no clear cut case could be made for preference of either of the tests over the other for use among independent schools. In reaching a decision as to whether or not SCAT should replace ACE, schools should take into consideration other aspects, such as foremat, ease and time of administering and scoring, meaningfulness and utility of scores, number of available forms, continuity of test results from year to year, and data pertinent to the reliability and intercorrelation of the scores.

North (41) summarized his study comparing the SCAT with the ACE by pointing out that at both the tenth and twelfth grade levels the correlations between the verbal and quanitative scores of the SCAT, and between the linguistic and quantitative scores of the ACE, fall within the range of .53 to .56. The reliability of the differences between the scores on the two principal parts is somewhat greater on the ACE than on the SCAT, suggesting that the ACE scores may provide a more reliable basis for making predictions of differential success in the language and quantitative areas. The linguistic or verbal scores have somewhat higher correlations with the total scores than do the quantitative scores on both tests and at both grade levels. This means that the linguistic or verbal scores have a slightly greater influence on the total scores. The difference between the contributions of the two part scores to the total score is greater on the ACE

test than it is on the SCAT, however. The correlations between the verbal and linguistic scores of the two tests, and between the total scores, are in the range of .78 to .85. These correlations are quite substantial, and compare favorably with the correlations that are usually found between different measures of academic ability. The correlation between the quantitative scores at the twelfth grade level is also quite high, .75, but the correlation between these scores at the tenth grade level is only .65. In general, the study of the test results yielded evidence that is slightly in favor of the American Council on Education Psychological Examination over the School and College Ability test.

Cooperative English Test

This test has been published by the Cooperative Test Division of Educational Testing Service for almost thirty years and is certainly one of the most widely used and best known tests available today. Pooley (7) stated that the Cooperative English Test is a combination of reading skills tests and two English skills tests, the latter being mechanics of expression and effectiveness of expression. The tests are combined to permit, in two hours testing time, a rather full analysis and diagnosis of English abilities at the high school and college levels. Travers (17) pointed out that next to high school grades, subject matter tests have been established as the second best predictor of college grades and that the Cooperative English Test has been found to be particularly valuable as a predictor of academic success. Hanna (30) stated that the Cooperative English Test in his study was found to be approximately equivalent to grades (covering four years

experience in high school English) in predicting achievement in college English. Carlin (8) found that the Cooperative English Test was a better predictor of total college scholarship than the ACE linguistic score. Studies have indicated that correlation coefficients for the Cooperative English Test and success in college range from .41 to .57, the median score being .48. (11, 24, 33, 51) Durflinger (19) concluded (as cited earlier) that the correlations between college scholarship and high school marks will vary from .50 to .60 with a median of approximately .55. He continued by pointing out that this is practically the same correlation between achievement tests and college scholarship as found by Segel (44). Thus it appears that a two hour achievement test will give a score that is as predictive of scholarship as the more laborious method of accumulating the high school grade point average.

Age of applicant

There are not many published studies that consider the age of applicant as it is related to academic success. Pierson (43), in a study at Michigan State College, used 600 randomly selected students to test the hypothesis that there is a positive correlation between the age of college students and the quality of their academic work. He found that the youngest students (up to and including 18 years) made the highest grades and the oldest students (25 years and older) were next. He concluded that the age of a student upon entering Michigan State College was of little significance as far as his academic success is concerned. Freehill (24), in a study using the ACE and the Coop. English to measure academic ability, found that students who arrive at school by 17 years of age or less were more able students.

Eursch and Cain (21) pointed out that a review of the literature

revealed a negative relationship between age and freshmen scholastic

success. Dwyer (20) also made an analysis of age as a predictive

measure. His results showed a negative trend up to a college entering

age of 21, and a positive trend beyond 21. When students enter college

beyond the age of 21, they are more likely to succeed. They are also

more likely to succeed if they enter at an early age, suggesting that

students who enter college early usually do so because they have super-

ior intellectual ability.

Parent's education

Nemzek (39), in a study considering non-intellectual factors for

prediction of academic success, concluded that the amount of education

of the father and the amount of education of the mother have little value

for predicting academic success. Honor point average in mathematics

and the education of the father had a correlation coefficient of .38.

The correlation coefficient for honor point average in languages and

the education of the father was .35. The other correlation coeffi-

cients computed were considerably lower. Bonner (4), in evaluating

factors associated with academic achievement of freshmen students,

found no significant relationship between the education of parents and

student's grade point average.

Factors Contributing to Prediction

Value of testing for prediction

Chauncey (12) observed that test scores and school marks together

predict more accurately than either one separately, and that each pre-

dictor identifies some potentially-high achiever not identified by the

other. Although results will vary, of the students in the top 20 percent on most scholastic aptitude tests such as the ACE, about 45 percent will do honor work, 52 percent will do satisfactory work and only about 3 percent will fail. Of the students in the bottom 20 percent on the test, only about 3 percent will do honor work, 52 percent more will pass, 45 percent will fail. In the middle 60 percent, 17 percent will do honor work, 66 percent satisfactory work and 17 percent will fail. He pointed out that when tests are properly understood and properly used they offer a potent aid in the selection, guidance, or placement of students.

Value of multiple variables

The various predictor variables in the studies cited do not give the accuracy that is needed in identifying the students who will be academically successful. Inasmuch as there are a number of variables that show a positive correlation with academic success and yet comparatively little correlation with each other, it would seem advisable to use these predictor variables in combination with each other. Travers (17) recommended this procedure when he stated that it is probable that the most satisfactory method of predicting general academic success in college is to combine a measure of high school success with a measure of scholastic aptitude. Using multiple correlation coefficients it is possible to obtain results as high as .70 to .80. There is a point of diminishing returns, however, and it is unlikely that any more than 3 variables will add much to the predictive value of the battery. In fact, Garrett (26) suggested that the addition of a third variable often adds very little to the predictive value of a combination. This is demonstrated in the following table:

Table 1. A comparison of the predictive effectiveness of two-variable
multiple correlations and three or more variable multiple
correlations

Relationship	No. of Studies	Range	Median
Two variable multiple correlations with college success	59	.47 to .79	.58
Three or more variable multiple correlations with college success			
Median of 3 variable studies	22	.54 to .81	.61
Median of 4 or more variables	8	.54 to .71	.55

Review of prediction studies

In considering the various predictor variables in the present
study it would seem appropriate to give further consideration to
Garrett's study, in which he brings together the findings of other
research workers. The results of studies dealing with factors re-
lating to college success are presented in Tables 2 and 3 in modified
form. (22)

Grades as a criterion of success

When an attempt is made to determine who is and who is not academi-
cally successful, the question arises, "What is academic success?" In
this study the student grade point average has been used as the criter-
ion. As Jex (36) has pointed out, however, this criterion admittedly
leaves much to be desired. Teachers at all levels vary considerably
in their philosophies and practices, and certainly a grade of "A"

Table 2. A summary of studies dealing with factors relating to college
success

Relationship	No. of Studies	Range	Median
High school scholarship with college average	32	.29 to .83	.56
Rank in high school graduating class and grades in college	29	.18 to .72	.54
General achievements tests and college achievement	24	.23 to .85	.49
Achievement tests in specific subject matter and general college achievement	57	.10 to .70	.40
Intelligence with general scholastic success	94	.17 to .67	.47

Table 3. Summary averages of coefficients of correlation reported
between achievement examinations and college scholarship and
between intelligence tests and college scholarship.

Relationship	Summary by	Date	N	Median r
Use of achievement in specific subject matter and general scholastic achievement in college	Douglass	1931	67	.55
	Segel	1934	13	.54
	Wagner	1934	88	.56
	Durflinger	1942	20	.48
Correlation of intelligence with general scholastic success	Douglass	1931	160	.45
	Kinney	1932	442	.45
	Segel	1934	100	.44

does not have the same meaning for all classes. Fink (22) observed that the measurement of relationship between grades and some other variable is dependent upon the reliability of the grades. The measured validity of an achievement test which predicts grades, will not, except for chance fluctuations, exceed the reliability of the criterion. However, most of the studies over the past 30 years have supported the notion that grades are fairly reliable. As mentioned earlier in this review, Cleeton (13) reported correlations from .77 to .82 between first and second semester grades of college freshmen. Crawford (16) found a reliability of .85 for one semester grades of Yale freshmen. Gerberich (27) concluded that differences obtained between students on first semester grades were maintained reliably throughout their college career. Jex (36) in a study at the University of Utah, concluded, that with grade reliabilities that are generally obtained, multiple correlations much larger than .70 cannot be expected. Greater accuracy of prediction than that which is usually reported will be possible only under more reliable systems for assigning college grades.

Summary

There are many limitations of the existing measures. Travers (49, p. 294) suggested that there is a need for a new trend in the approach to the study of predicting achievement.

> First, there is a need of knowledge on the extent to which commonly occuring variations in the students environment affects the achievement of various outcomes. Second, much more information is needed concerning the outcome that any program of teaching is designed to achieve, and valid measures must be developed for each of these outcomes. When such basic steps have been taken, the time will be right for the preparation of new tests

to predict achievement. In the meantime, the pro-
liferation of many new tests of academic aptitude will
represent an activity analogous to the search for the
philosopher's stone.

Travers (17) has gathered together the results of many studies of the

empirical relationships between scores on tests and grades. It seems

appropriate to include here, in summary, the conclusions at which he

has arrived from his survey of literature in this field.

1. Measures of various aspects of intelligence, such as verbal

reasoning and quantitative reasoning, provide better predictions of

academic success than are provided by measures of general scholastic

ability.

2. The best single predictor of general academic success in

college is the student's high-school performance. The particular

sequences he has had in high school, however, bears no relationship

to college success, and little advantage is gained in a specific

course in college by taking the corresponding course in high school.

3. Subject-matter tests and tests of scholastic aptitude have

some value in predicting success in college but they are less valid

than the high school record for this purpose. It is probable that

the most satisfactory method of predicting general academic success in

college is to combine a measure of high school success with a measure

of scholastic aptitude.

4. At the college level, prediction of academic success in

specific subject-matter fields can be made with greater accuracy than

over-all predictions.

Most of Traver's conclusions are substantiated by the studies reported

in the present survey. In addition, the following observations based

on the literature cited are presented:

1. Correlations using high school marks as predictor variables vary more than do those using scholastic aptitude tests.

2. The difference in the predictive value of high school marks and scholastic aptitude tests is comparatively small.

3. The linguistic or verbal score on scholastic aptitude tests has greater predictive value than the quantitative score.

4. The difficulty and predictive value of the SCAT and ACE are virtually the same.

5. There appears to be no significant relationship between the education of parents and the academic success of their children.

6. Basic high school courses such as English and mathematics, have approximately the same predictive value as the total high school grade point average.

CHAPTER III

METHODS AND PROCEDURES

Selecting the Subjects

The subjects in this study were freshman students who were admitted
to the College of Forestry fall quarter, 1958. The sample included
only those who (a) took the Cooperative English Test and the School
and College Ability Test during orientation week and (b) received
grades at the end of fall quarter. Of the 133 students, who were
accepted for admission to the College of Forestry, 88 actually regis-
tered at the beginning of fall quarter. Two of that group did not take
the placement exams and six withdrew before the quarter was completed,
leaving 80 subjects at the beginning of the study.

Variables in the Study

To test the hypotheses listed earlier the following variables
were considered:

First quarter grade point average

The grade point average was used as the criterion of academic
success. This average, based on grades received in all classes, is
the sum of grade points (A equals 4, B equals 3, C equals 2, D equals
1, F equals 0) divided by the number of quarter hours for which the
student is registered. This is the procedure for determining a stu-
dent's academic standing at the end of each quarter.

First year grade point average

Inasmuch as the first year grade point average was also available, zero order correlations were computed using that measure as the criterion of academic success. The sample was restricted, somewhat, because of the number who discontinued their studies in the College of Forestry during their first year. Of the 80 subjects who began the study, only 54 registered in the College of Forestry all three quarters, with 11 transferring to other colleges on the campus and 17 withdrawing from school.

High school grade point average

The grades received by the students during his four years in high school.

Basic courses of English, mathematics, chemistry and physics

The high school courses used at the present time by the College of Forestry in selecting students for admission to their school.

School and College Ability Test

This test consists of four rather-short sub-tests. Two of these parts, sentence completion and vocabulary, have to do with verbal tasks, while the other two parts, computation and problem solving are concerned with numerical tasks. In all, the test contains 60 verbal items and 50 numerical items. The entire test requires a total of 70 minutes working time and yields three scores, verbal, quantitative and total. Each of the 3 kinds of raw scores is translated into a three digit converted score for the purpose of recording results.

Cooperative English Test

The first section, "A", Mechanics of Expression concerns matters of correct usage and syntax, punctuation and capitalization, and spelling. The second section, "B", Effectiveness of Expression, attempts to measure factors in self expression which lend themselves to the objective testing technique. The third section, "C 1", is Reading Comprehension and provides scores in vocabulary, speed of comprehension, level of comprehension and total reading. The reading sections of this test are based on the belief that reading comprehension is essentially a thinking process, a process which requires mental facilities in manipulating verbal concept, a background of experience, and skill in the specialized techniques of reading comprehension.

Age of applicant at the time of entrance

This information is presented in years. A comparison was made between the students 20 and under and the students 21 and over to determine if one group was more successful, academically, than the other.

Father's education

The number of years of formal education the father had had, including short courses or years in trade schools. A comparison was made of students whose fathers had had less than 12 years of formal education with those whose fathers had had 12 years or more to determine if one group of students was more successful academically than the other group of students.

Mother's education

The number of years of formal education the mother had had, not including years in business school or beauty school. A comparison was made of the students whose mothers had had less than 12 years of formal education and those whose mothers had had 12 years or more to determine if one group of students was more successful academically than the other group of students.

Difference between father's and mother's education

This variable is the difference in the number of years of formal education the parents had had. A comparison was made between the students whose mothers had more education than their fathers and those whose fathers had as much as or more education than their mother to determine if one group of students was more successful academically than the other group of students.

Gathering and Processing Data

The following procedures were used in gathering and processing the data:

1. Students apply for admission to Utah State University on a uniform application form used by all universities in the state. The applications are received by the admissions officer of the university who directs them to the college selected by the applicant. In addition to the completed application form, the student is also required to send a transcript of high school credits, which is also forwarded to the college of his choice. The college evaluates the transcript and the information presented on the application form and then notifies the

registrar as to whether or not the applicant has been (a) accepted, (b) accepted on probation, or (c) rejected.

2. The high school grade point average was computed by converting the grades listed on the transcript to the 4 point system. All subjects taken during the 9th, 10th, 11th, and 12th grades were included in the average unless they were listed as P, indicating credit only.

3. The Cooperative English Test and the School and College Ability Test were given to all entering Freshman as part of orientation procedures during the week prior to registration.

4. The tests were scored by IBM process and all results were double checked. The same precautions were taken in recording the data.

5. All data used in this study were then quantified and coded for analysis by IBM processes.

Statistical methods used

The present study attempted to determine (a) the significance of difference between various predictor variables, (b) the relationship between different variables, and (c) which variables would best identify potentially successful students.[1] The following statistics were used:

Chi-square.--This is a method used for comparing experimentally obtained results with those expected theoretically on some hypothesis. In this study the 2 x 2 contingency table was used to determine the significance of difference between the criterion and the non-intellectual variables.

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[1]See Garrett, Henry E., Statistics in Psychology and Education, Longmans, Green and Co: New York, for a more complete discussion.

Product-moment coefficient of correlation.--This statistic is
used to determine the correlation between scores when the relation-
ship between measures is linear. The coefficient is designated by
the letter "r". It was used in this study to determine the relation-
ship between the criterion and the results obtained with the tests and
as predictor variables. Correlation coefficients were also computed
to show the intercorrelation of the predictor variables.

Correction for restriction of range.--Since some students withdrew
from school or transferred to other colleges on the campus before
the end of the academic year, it was necessary to correct for a re-
striction of range of grades or scores for the various predictors.
The restriction of range theoretically resulted in a lower correlation
between first year grade point average and the other variables.
Garrett (26) presents a formula for estimating the correlation in
an uncurtailed range from the correlation in a curtailed range and
in this instance, the formula was used to estimate the correlation
between the first quarter grades and the predictor variables. The
group using first quarter grades was less restricted in range than
the group who completed three quarters of work.

Biserial correlation.--This statistic is used to measure the rela-
tionship between one variable that is continuous and a second variable that
is dichotomous. In the present study the continuous variables were the
scores received on the various tests, or grades achieved in high school.
The dichotomized variable was made up of the group who received a 2.0
college grade average or better and the group who did not; or in another

instance, it was the group who had achieved a 2.0 and were still in school and the group who had not received a 2.0 and had dropped out of school. In the latter case a widespread biserial correlation was computed.[1]

Under specified conditions the biserial r is an estimate of the product moment r.

Statistical comparisons made

Product moment correlations were computed between college grade point average and the following variables: high school grade point average, high school English, Mathematics, Chemistry and Physics grade point average, high school English and mathematics grade point average SCAT Verbal score, SCAT Quantitative score, SCAT Total score, Coop. English Reading Comprehension score, Coop. English Effectiveness of Expression score, Coop. English Mechanics of Expression score and Total English score. These computations were made for first quarter grade point average and first year grade point average. A correction for restriction in range was computed when the latter was used as the criterion.

To determine the interrelationship of all of the variables, product moment correlations were run using all possible combinations of variables including first quarter grade point average.

Biserial correlations were computed for the group who received a 2.0 college grade point average or higher and the group who received less than a 2.0 grade average. The college grade point was considered

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[1]See Peters, Charles C. and Van Voorhis, Walter R., Statistical Procedures and their Mathematical Bases, McGraw Hill Book Company, Inc: New York, for a discussion of this statistic.

the dichotomous variable, with the following tests and grade point averages as the continuous variables: high school grade point average, high school English and mathematics grade point average, SCAT Verbal score, SCAT Quantitative score, SCAT Total score, Coop. English Reading Comprehension score, Coop. English Effectiveness of Expression score, Coop. English Mechanics of Expression score and Total English score.

Widespread biserial correlations were computed for the group who had achieved a 2.0 college grade point average and were still in school and the group who had received less than a 2.0 grade average and had dropped out of school. The college grade point average was considered the dichotomous variable with the following tests and grade point averages as continuous variables: English and mathematics grade point average, SCAT Total score and Coop. English Total score.

In an attempt to establish a cut-off point for selecting students for admission, biserial correlations were computed, using the scores on the SCAT Total and the Coop. English Total as the dichotomous variables and first year grade point average as the continuous variable. Correlations were determined with the cut-off point at the 10th, 15th, and 25th percentiles.

The Chi square contingency table was used to compute the differ- ence between students who achieved 2.0 and students who received less than a 2.0 in relation to (a) mother's education (b) father's educa- tion (c) difference between father's and mother's education and (d) age of applicant.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The data obtained from the research in the present study are
presented in tables on the following pages. Observations are made
concerning the significant data found in each table.

Contrary to the findings reported in the review of literature
the high school grade point average did not correlate as highly with
fall quarter grade point average as did the other variables tested.
The obtained correlation coefficient of .17 is lower than any reported
in the studies cited. (See Table 4)

The relationships found in this study between fall quarter college
grade point average and SCAT Total score (.52), SCAT Verbal score (.50),
Coop. English Reading Comprehension score (.50), Coop. English Effecti-
veness of Expression score (.45), Coop. English Total English score
(.43), and SCAT Quantitative score (.41) are comparable to the results
obtained in previous research.

The composite grade point average for English, mathematics,
chemistry, and physics, correlated more highly with fall quarter grade
point average than did the total high school grade point average. The
correlation coefficient for the composite score was .35 as compared
to .17 for high school grade point average. The number of students
who had taken all four subjects was rather small (N = 22). All stu-
dents had taken English and mathematics however, and the correlation

coefficient between these two subjects and the criterion (.37) was slightly higher than the correlation for the composite score for English, mathematics, chemistry and physics (.35).

All correlation coefficients for first quarter grade point average and the predictor variables except high school grade point average were statistically significant at the .01 level of confidence.

Table 4. Correlations between fall quarter grade point average and nine predictor variables

Variable	Number	Correlation
High School GPA	80	.17
English, Mathematics Chemistry, and Physics GPA	22	.35**
English and Mathematics GPA	80	.37**
SCAT Verbal	80	.50**
SCAT Quantitative	80	.41**
SCAT Total	80	.52**
Coop. English Total Reading Comprehension	80	.50**
Coop. English Mechanics of Expression	80	.31**
Coop. English Effectiveness of Expression	80	.45**
Coop. English Total English	80	.43**

**Significant at the .01 level of confidence

The intercorrelations between the predictor variables and the criterion are presented in Table 5. A high relationship between the

SCAT Verbal and several scales of the Coop. English Test is shown by correlations of .83, .70, .75 with the scales of Reading Comprehension, Effectiveness of Expression and Total English, respectively. There are also significant relationships between SCAT Total and two scores on the Cooperative English Tests, Reading Comprehension (.67) and Total English (.67).

The correlation coefficient between fall quarter grade point average and winter quarter grade point average was .77, which is comparable to those cited in the survey of the literature. Inasmuch as the results for the three quarters of the freshmen year were also available, it was decided to compute product moment correlations using first year grade point average as the criterion, with the same predictor variables as were used with the fall quarter point average. This served to cross validate the present study and to compare the value of these instruments for predicting academic success the first year with their value for predicting academic success the first quarter.

Because the range of scores was restricted when 26 of the subjects withdrew from school or transferred to other colleges on the campus, a correction was also computed.

There are distinct differences between the correlation coefficients for first quarter grade point average and the predictor variables as compared with the first year grade point average and the same variables. (Table 6) English and mathematics grade point average was the only variable that had a relationship with first year grade point average (.36) comparable to the one obtained with first quarter grade point average (.37). One variable showed an increase, however. The correlation provided by high school grade point average changed from .17 to .24.

Table 5. Intercorrelations of fall quarter grade point average (GPA), high school grade point average (HSGPA), English-mathematics grade point average (E-MGPA), SCAT Verbal score (SCAT V), SCAT Quantitative score (SCAT Q), SCAT Total score (SCAT T), Cooperative English Total Reading Comprehension (TRC), Cooperative English Mechanics of Expression (ME), Cooperative English Effectiveness of Expression (EE), and Cooperative English Total (TE).

	GPA	HSGPA	E-MGPA	SCAT V	SCAT Q	SCAT T	TRC	ME	EE	TE
GPA		.17	.37	.50	.41	.52	.50	.31	.45	.43
HSGPA			.79	.26	.22	.25	.24	.02	.17	.13
E-MGPA				.39	.28	.37	.38	.12	.42	.41
SCAT V					.37	.80	.83	.37	.70	.75
SCAT Q						.72	.34	.29	.37	.32
SCAT T							.67	.42	.58	.67
TRC								.51	.73	.84
ME									.42	.72
EE										.83
TE										

Table 6. Correlations between first year grade point average and various predictor variables

Variable	Number	Correlation	Corrected Correlation[1]
High School Grade Point Average	54	.24	.18
English-Mathematics Grade Point Average	54	.36**	.38**
SCAT Verbal	54	.20	.33*
SCAT Quantitative	54	.02	.05
SCAT Total	54	.15	.18
Coop. English Total Reading Comprehension	54	.35**	.54**
Coop. English Mechanics of Expression	54	-.10	-.02
Coop. English Effectiveness of Expression	54	.10	.16
Coop. English Total English	54	.04	.03

[1]Corrected for restriction of range.
*Significant at the .05 level of confidence.
**Significant at the .01 level of confidence.

Coop. English Reading Comprehension was the only test that had a correlation coefficient (.35) with first year grade point average that was significant at the .01 level of confidence. While all of the test scores correlated at the .01 level of significance when first quarter grade point average was the criterion, this relationship between test scores and college grades was not evident when the criterion of first year grades was used.

After the correction for restriction in range was added to the correlation coefficients, SCAT Verbal and Coop. English Reading Comprehension were the only variables to show very much increase, i.e. .20 to .33 and .35 to .54 respectively. SCAT Verbal was then significant at the .05 level of confidence. High school grade point average and Coop. Total English both decreased slightly.

In considering combinations for the computation of a multiple correlation, the advisability of using any of the SCAT results with sub-scores on the Coop. English was questioned because of their high inter-correlations. Combining SCAT Total with English and Mathematics grade point average was considered as a possibility, but in view of the low r's obtained in the computations between first year grade point average and the other variables, this idea was abandoned. Instead, biserial correlations were computed in an attempt to select the measures that would identify those students who can succeed in the College of Forestry by achieving a 2.0 or better and to identify those who will drop out because of a low grade point average.

SCAT Total has the highest correlation (.47) with the dichotomous variable. Coop. English Total was also one of the more predictive variables (.40). English-Mathematics grade point average was the highest non-test variable (.29) but had even less value for prediction than the test scores. (Table 7)

On the basis of these results another dichotomy was established in which widespread biserial correlations were computed. For the latter correlations, the three highest variables were used as the continuous variables; the group of subjects who had achieved a 2.0 or better and were still registered in the College of Forestry, and the

Table 7. Biserial correlations between various predictor variables
and first year grade point average.[1]

Variable	Number	Biserial Correlation
High School Grade Point Average	80	.25
English-Mathematics Grade Point Average	80	.29
SCAT Verbal	80	.21
SCAT Quantitative	80	.21
SCAT Total	80	.47
Coop. English Total Reading Comprehension	80	.27
Coop. English Mechanics of Expression	80	.12
Coop. English Effectiveness of Expression	80	.17
Coop. English Total English	80	.40

[1]This variable was dichotomized at 2.0 grade point average.

group of subjects who had received less than 2.0 and had dropped out of school were considered the dichotomous variable.

The correlation coefficients for both continuous variables increased markedly when the students who had withdrawn from the College of Forestry with passing grades were not included in the sample. SCAT Total increased from .47 to .58 and Coop. English Total changed from .40 to .71. (Table 8)

Table 8. Biserial correlations between predictor variables and grade point average.[1]

Variable	Number	Biserial Correlation
English-Mathematics Grade Point Average	54	.44
SCAT Total	54	.58
Coop. English Total English	54	.71

[1]A widespread dichotomy was created by grouping students who had received a 2.0 and were still in school at one tail of the curve and grouping students who had received less than a 2.0 and had dropped out of school at the other tail of the curve.

Table 9 shows that the most significant correlation coefficients were found when the test scores were dichotomized at the 10th percentile. First year grades compared to SCAT Total score was 1.07 and the Coop. English Total score was .87.

There was no significant relationship between the non-intellectual variables and academic success indicated in the present study. (Table 10)

Table 9. Biserial correlations between first year grade point average
and the SCAT Total score and the Coop. English Total score[1]

Variables	Number	10%ile	15%ile	25%ile
First year grade point average vs. SCAT Total score	80	1.07^2	.70	.46
First year grade point average vs. Coop. English Total score	80	.87	.82	.46

[1]These variables were dichotomized at the 10th, 15th, and 25th
percentiles using publisher's freshmen norms.
[2]Biserial correlations are not restricted to the $\pm$ 1.0 range.

Table 10. Chi square comparison of academic success,[1] and non-
intellectual variables

Variable	N.	df.	Chi Square
Age of Applicant	80	1	1.44
Education of Father	73	1	.53
Education of Mother	74	1	.018
Difference[2]	71	1	.23

[1]Academic success is determined by grade point average. C is passing.
[2]Difference between father's and mother's education in years.

Discussion

In light of the findings reported in the review of literature, it would seem that the low correlation coefficient obtained between high school grade point average and first year college grade point average in the present study points up the problem of selection which confronts the College of Forestry. Although high school grade point average might be used to help identify students who will succeed in other academic areas, the present study does not support the use of this criterion for selection in the College of Forestry.

One might speculate on the disparity between the results of the present study and those reported in the review of literature. It has been suggested by the faculty of the College of Forestry that the prospective forestry student approaches his courses with considerable misinformation about the forestry training program. Although he may have the aptitude to succeed, he loses interest when he takes mathematics and physics courses instead of those involving outdoor activities. It is possible that he loses the motivation necessary to achieve satisfactory grades. Further research should be done to determine the validity of this assumption.

It was also noted that the predictive value of a composite of grades in English and mathematics was somewhat better than a high school grade point average using all subjects. Although neither measure contributes significantly to the prediction of academic success, the best tentative measure of the two would be the computation of a grade point average involving just two subjects since it would be less complicated than computing one for all high school courses.

The difference in the relationship of these two measures with college grades might also support the hypothesis advanced in explaining the low correlation between high school grade point average and college grade point average. It is possible for a student to have a fairly-high total grade point average in high school and not have received above average grades in English and mathematics. Success in academic courses such as English and mathematics would seem to require the same type of motivation necessary to succeed in the courses of the forestry curriculum.

The correlation coefficients between the test scores and first quarter grades were comparable to those reported in other studies. When a comparison was made between the predictor variables and first year grades, however, only two correlation coefficients were significant at the accepted levels of confidence. This apparently was due in part to the restriction of range caused by the large number of dropouts (32 percent) during the first two quarters. But even after the correction for restriction of range was made, only one other variable became significant (SCAT Verbal). This difference suggests that the variables considered are predicting more accurately at the lower end of the scale.

The value of the predictor variables for identifying students who may be on "warned" or "probationary" status after one year of study is somewhat more significant than their value for predicting the student's level of academic achievement as measured by his grade point average. The biserial correlations were considerably higher than the product moment correlations coefficients. As a rule, however, biserial r is somewhat higher than product moment r. The biserial correlation

coefficient gives an estimate of the product-moment r to be expected, and this only when certain assumptions such as a large sample have been met. It is therefore difficult to compare it with other coefficients of correlation. In addition to these limitations, biserial r usually has a larger standard error than product moment r.

The markedly higher correlation coefficients obtained when the widespread biserial r was used demonstrates the effect of focusing on the ends of the distribution. In this instance the students who had withdrawn from the College of Forestry with passing grades were not included in the sample. It was this group that formed the middle of the distribution. Inasmuch as the extremes follow regression lines a statistic that would expose this relationship was necessary. The widespread biserial r focused attention on these extremes, whereas regular biserial r had a tendency to conceal this relationship. This technique allowed a more careful scrutiny of the subjects at the ends of the distribution.

According to the analysis of the SCAT Total score, it is possible, theoretically, to determine the point below which all students will fail. Although the number who will obviously fail according to the test scores is rather small (six percent) it may still be desirable to use the SCAT Total score to identify this group and question their admission. Additional research into the question of misinformation concerning the content of the forestry program and its effect on moti- vation may provide the key to more accurate screening.

The results of the present study comparing non-intellectual variables and academic success were similar to the findings reported in the review of literature. There seems to be very little relationship

between the applicant's academic achievement and his age, the education
of his father, the education of his mother, or the difference in the
parents' educational levels.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The faculty of the College of Forestry is concerned about the
drop-out rate of freshmen students who enter the forestry program.
It is not unusual for as many as 40 to 50 percent of these new students
to be on "warned" or "probationary" status at the end of their first
quarter. Only 10 to 15 percent of the entering freshmen will graduate
in Forest, Range or Wildlife Management four years later.

This information has prompted the faculty to question their
methods of student selection. At present, the applicant's admission
is based on (a) high school grade point average in English, mathe-
matics, chemistry, and physics, and (b) the committee's over-all
impression of the general information supplied by the applicant.

The purpose of this study was twofold: (a) to evaluate the pre-
sent method of selecting students for admission to the College of
Forestry and (b) to consider other predictive instruments that may
be of value in selecting qualified applicants.

It was decided to evaluate the results of the School and College
Ability Test and the Cooperative English Test inasmuch as they are
already given as part of the placement battery administered to all
entering freshmen at Utah State University. It was felt that this
would also provide empirical evidence of the predictive value of these
tests, which in turn would assist the faculty of the College of

Forestry and the counselors in the Counseling Service in interpreting these test data to students.

All freshmen in the College of Forestry who (a) took the Cooperative English Test and the School and College Ability Test during orientation week and (b) completed one quarter of schooling were included in the sample. There were 80 subjects who met these requirements. First quarter and first year grade point averages were used as the criteria of academic success. The following variables were evaluated as predictors: high school grade point average, a composite grade point average of high school courses in English, mathematics, chemistry and physics, School and College Ability Test, Cooperative English Test, age of applicant at the time of entrance, father's education, mother's education and difference between father's and mother's education.

High school grade point averages were computed from the high school transcript of credits which had been sent to the university admissions officer with the student's application for admission to the university. The Cooperative English Test and the School and College Ability Test were given to all entering freshmen during orientation week.

The present study attempted to determine (a) the significance of difference between various predictor variables, (b) the relationship between different variables, and (c) which variables would identify potentially successful students in forestry. The following statistics were used: Chi square, product-moment coefficient of correlation, correction for restriction of range, biserial correlation, and widespread biserial correlation.

Statistical comparisons were made comparing college grade point

average with grade point averages in various high school courses and with sub-scores and total scores on the SCAT and the Coop. English tests. Biserial correlations were computed for the group who had a 2.0 college grade point average or higher and the group who had received less than 2.0 grade point average as the dichotomous variable. Test results and high school grade point averages were the continuous variables. Widespread biserial correlations were computed for the group who had achieved a 2.0 college grade point average and were still in school and the group who had received less than a 2.0 grade average and had dropped out of school. English and mathematics grade point average, SCAT Total score and Coop. English Total score were used as the continuous variable.

In an attempt to establish a cut-off point for selecting students for admission, biserial correlations were computed, using the scores on the SCAT Total and the Coop. English Total as the dichotomous variables and first year grade point average as the continuous variable. Correlations were determined with the cut-off point at the 10th, 15th and 25th percentiles.

The Chi square contingency table (2 x 2) was used to compute the difference between students who achieved 2.0 and students who received less than a 2.0 in relation to (a) mother's education (b) father's education (c) difference between father's and mother's education and (d) age of applicant.

Contrary to the findings reported in the review of the literature the high school grade point average did not correlate as highly with fall quarter grade point average (correlation of .17) as did the other variables tested. The relationship between fall quarter grade point

averages and the scores on the various tests are comparable to the results obtained in previous research (correlations from .41 to .52). The composite grade point average for English and mathematics correlated more highly with fall quarter grades than did total high school grade point average. The correlation coefficient between fall quarter grade point average and winter grade point average was .77. There was a significant difference between the correlations for first quarter grade point average and the predictor variables as compared with the first year grade point average and the same variable. All but one correlation coefficient was significant at the .01 level when first quarter grade point average was used as the criterion but only one correlation coefficient was statistically significant when first year grade point average was used as the criterion. When biserial correlations were computed, SCAT Total score (biserial r = .47) and Coop. English Total score (biserial r = .40) had the highest relationship with the dichotomous variable. A widespread biserial, however, produced correlations of .58 for the SCAT Total and .71 for the Coop. English Total.

The most significant correlation coefficients were found when the test scores were dichotomized at the 10th percentile. First year grades correlated 1.07 with SCAT Total score and .87 with the Coop. English Total score.

There was no significant relationship between academic success and the non-intellectual variables investigated in the present study.

Conclusions

On the basis of the results of this study the following conclusions have been reached:

1. The high school grade point average, although quite useful in predicting general college achievement, was not effective for this group of students in determining who will succeed in the College of Forestry.

2. Inasmuch as the correlation coefficient for first quarter grade point average and a composite grade point average for English, mathematics, chemistry, and physics was greater than that obtained for total high school grade point average, the hypothesis that the latter is more effective in predicting college success is considered untenable.

3. The correlation coefficients for the School and College Ability Test and the Cooperative English Test with first quarter grade point average justify the acceptance of the hypothesis that these two tests would be more effective in predicting academic success than the method now used by the College of Forestry.

4. Inasmuch as there was no significant difference between grades received by students who were of different ages or whose parents had had different amounts of education, the hypothesis that there would be a significant difference in the background variables of successful and non-successful students is rejected.

5. The value of the predictor variables for identifying applicants who will be on "warned" or "probationary" status after one year of study is somewhat more significant than their value for predicting the applicant's level of academic achievement as measured by his grade point average.

6. There is a need for additional research in this area to identify other factors that are contributing to the high drop-out rate in the College of Forestry.

Recommendations

As a result of the information gathered and the conclusions reached the following recommendations are made:

1. The College of Forestry should consider other criteria for new forestry students than the student's high school grades, but if grades are used, it would seem that a composite grade point average of English and mathematics would be the best combination. All applicants have had these two subjects, whereas only about one fourth of the applicants have had courses in all four subjects of English, mathematics, chemistry, and physics.

2. If admission to the College of Forestry is to be based in part, on a test score such as the School and College Ability Test Total score, it is recommended that the applicant be required to send the results of the School and College Ability Test with his application and transcript of credits. This would make it possible for him to be informed of his acceptance or rejection prior to his coming to the campus.

3. It is recommended that additional research be conducted to identify other factors that may be contributing to the high dropout rate in the College of Forestry.

APPENDIX

SCHOLARSHIP POLICY OF THE SCHOOL OF FOREST, RANGE

AND WILDLIFE MANAGEMENT

Classes of student scholarship:

Class I Satisfactory Scholarship

All students with a total grade-point average of 2.00 or better
whose grade-point average for the most recent quarter is 2.00 or
better.

Class II Students Warned about Unsatisfactory Scholarship

a. Regular second-quarter freshmen earning a total grade-point
average of more than 1.75 but less than 2.0 in the first quarter.

b. Transfer students with one year or less of college credit with
a total grade-point average of more than 1.75 but less than 2.0.

c. Regular students with a total grade-point average of 2.0 or
better whose grade-point average for the most recent quarter is
less than 2.0.

d. Regular students with a total grade-point average of more
than 1.75 but less than 2.0 whose grade-point average for the
most recent quarter is 2.0 or better.

Class II students remain in Class II until such time as they qualify
for Class I status by earning a total grade-point average of 2.0 or
better and a grade-point average in the most recent quarter of 2.0
or better. They will move to Class III upon failure to earn a
grade-point average in the most recent quarter of 2.0, if their
total grade-point average is below 2.0.

Class III Students on Probation

a. Any Class II student with a total grade-point average of less
than 2.0 whose grade-point average for the most recent quarter is
less than 2.0.

b. Any regular student with a total grade-point average of 1.75
or less.

c. Entering freshmen and transfer students whose performance
record merits admission but indicates substandard scholarship.

Class III students will remain in Class III until such time as they
qualify for Class I status by earning a total grade-point average
of 2.0 and a grade-point average in the most recent quarter of 2.0
or better. They will move to Class IV upon failure to earn a grade-
point average in the most recent quarter of 2.0 or better.

Class III students' registration will be limited to 15 credit hours, including P.E. and M.S.

Class IV Students on Probation under Written Contract

a. Any Class III student who fails to earn a grade-point average in the most recent quarter of 2.0 or better.

Class IV students will remain in Class IV, on written probation, until they qualify for Class I status by earning a total grade-point average of 2.0 or better and a grade-point average in the most recent quarter of 2.0 or better. Class IV students will have their registration book impounded if they fail to earn a grade-point average of 2.0 or better in the most recent quarter.

Class IV students will be permitted to re-register in the School of Forest, Range and Wildlife Management only after:
1) A plan is proposed by the student and his advisor whereby the student can improve his scholastic standing.
2) A written contract is signed by the student, by which he agrees not to register in the School of Forest, Range and Wildlife Management for at least two quarters, if he fails to earn a 2.0 grade-point average.

Class V Students with Impounded Registration Book

Any Class IV student who fails to earn a grade-point average of 2.0 or better.

Class V students will be denied registration in the School of Forest, Range and Wildlife Management. However, a student who has been denied registration because of his Class V status may, after an interval of two quarters or longer, ask permission to register again in the School of Forest, Range and Wildlife Management. He will then be required to present evidence of improved attitude, performance or condition which may have been responsible for the previous poor record. At the discretion of the "Scholarship Committee" the student will then be placed again on written contract and given opportunity to make a grade-point average of 2.0 each quarter thereafter. Any failure to earn at least a 2.0 grade point or better average will result in denial of future registration in the School of Forest, Range and Wildlife Management.

Grade Requirements in Upper Division

In addition to maintaining a grade-point average of 2.0, a maximum of only 18 hours of D grades earned while the student is in upper-division standing will be counted toward graduation.

Restricted Extracurricular Activities

Students with unsatisfactory scholarship and placed in Class III or lower will be restricted from holding Forestry Club offices and publications offices, such as "Juniper," "Chips," etc.

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