

University of New Mexico

UNM Digital Repository

Teacher Education, Educational Leadership &
Policy ETDs

Education ETDs

5-2-1940

Predictive Value of the State-Wide College Placement Tests

Arthur C. Woodburn Jr.

Follow this and additional works at: https://digitalrepository.unm.edu/educ_teelp_etds

Recommended Citation

Woodburn, Arthur C. Jr.. "Predictive Value of the State-Wide College Placement Tests." (1940).
https://digitalrepository.unm.edu/educ_teelp_etds/251

This Thesis is brought to you for free and open access by the Education ETDs at UNM Digital Repository. It has been accepted for inclusion in Teacher Education, Educational Leadership & Policy ETDs by an authorized administrator of UNM Digital Repository. For more information, please contact disc@unm.edu.

UNIVERSITY OF NEW MEXICO-UNIVERSITY LIBRARIES



A14429 104939

WOOD-
BURN

COLLEGE
PLACE-
MENT
TESTS

378

.789

Un

30 wo

1940

60p.2

LIBRARY
of
THE UNIVERSITY OF
NEW MEXICO



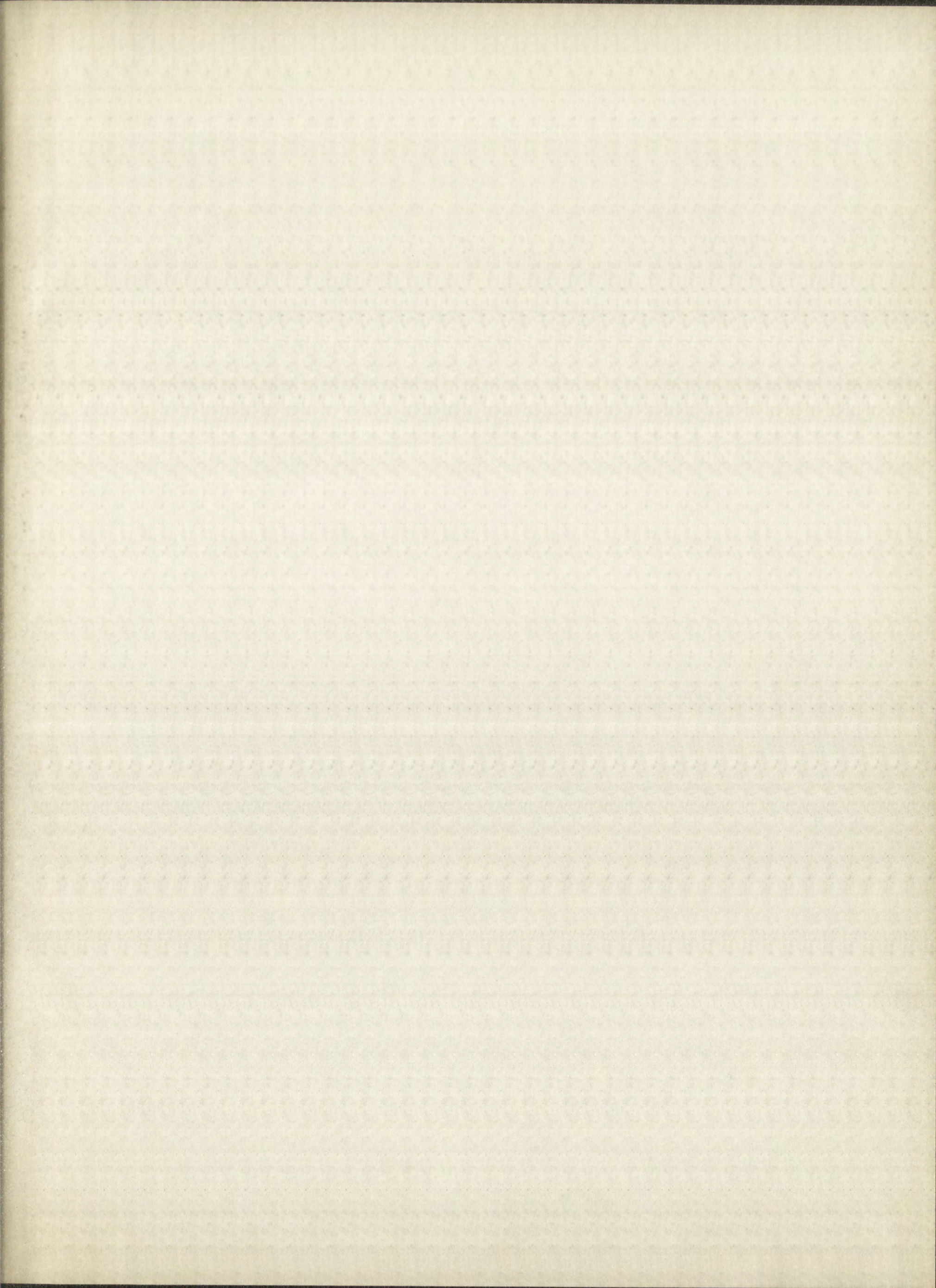
69857

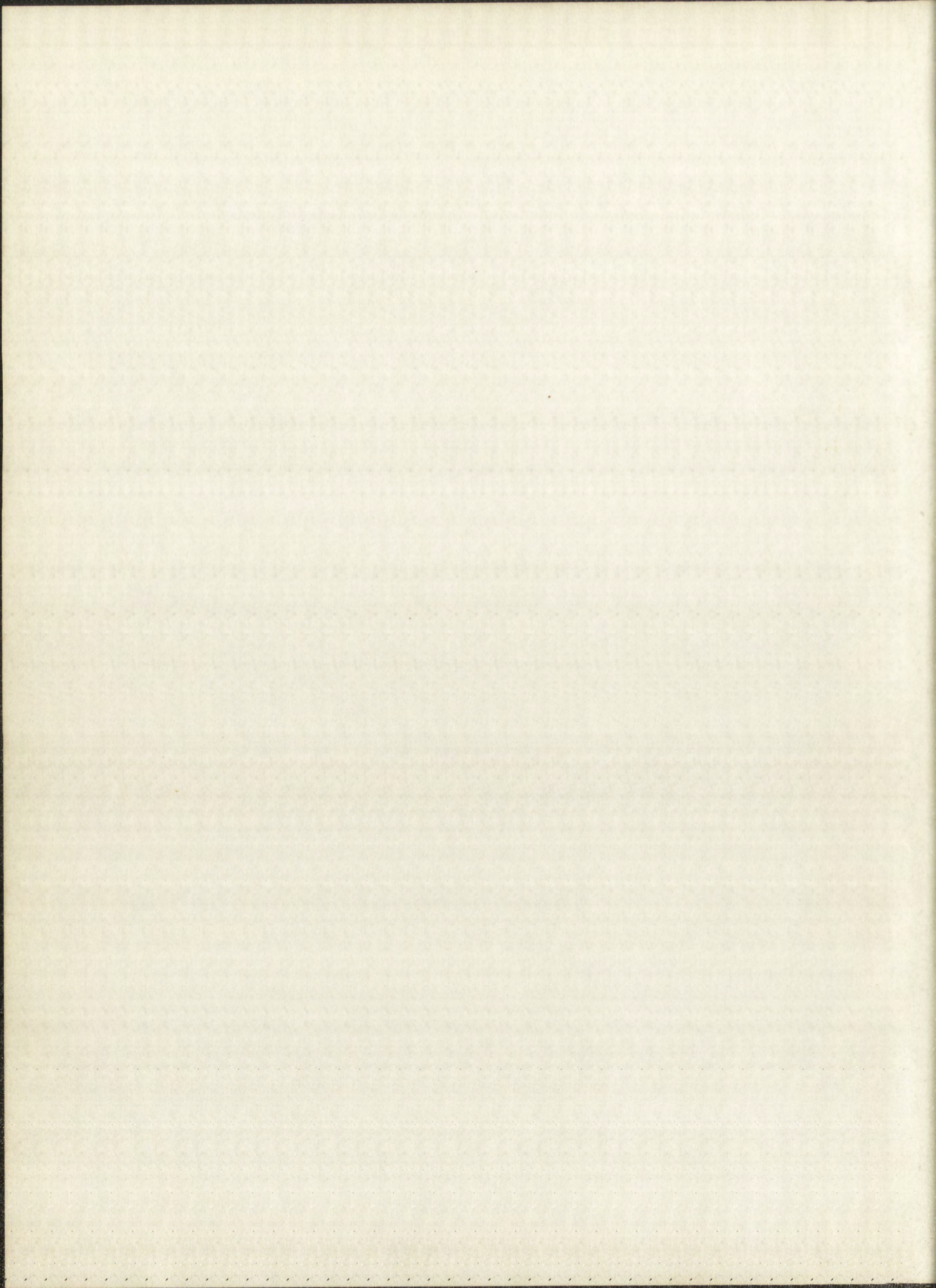
CLASS
378.789

BOOK
Un 30wo
1940
cop. 2

[illegible]

DEMCO 38-297





UNIVERSITY OF NEW MEXICO LIBRARY

MANUSCRIPT THESES

Unpublished theses submitted for the Master's and Doctor's degrees and deposited in the University of New Mexico Library are open for inspection, but are to be used only with due regard to the rights of the authors. Bibliographical references may be noted, but passages may be copied only with the permission of the authors, and proper credit must be given in subsequent written or published work. Extensive copying or publication of the thesis in whole or in part requires also the consent of the Dean of the Graduate School of the University of New Mexico.

This thesis by ..A..C..Woodburn, Jr.
has been used by the following persons, whose signatures attest their acceptance of the above restrictions.

A Library which borrows this thesis for use by its patrons is expected to secure the signature of each user.

NAME AND ADDRESS

DATE

MANUSCRIPT - 1472

PREDICTIVE VALUE OF THE STATE-WIDE
COLLEGE PLACEMENT TESTS

By

A. C. Woodburn, Jr.

A Thesis

Submitted in partial fulfillment of the
Requirements for the Degree of
Master of Arts in Education

University of New Mexico

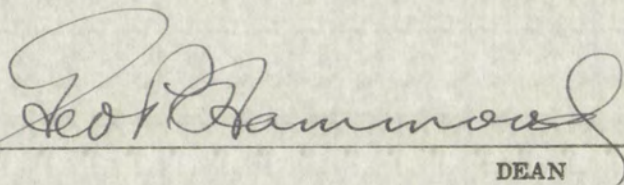
1940

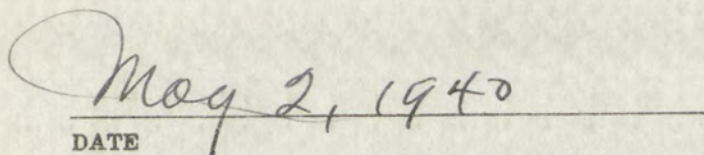
RECEIVED
JAN 11 1901
U.S. DEPT. OF AGRICULTURE
WASHINGTON, D.C.

378.789
Un 30 wo
1940
cop. 2

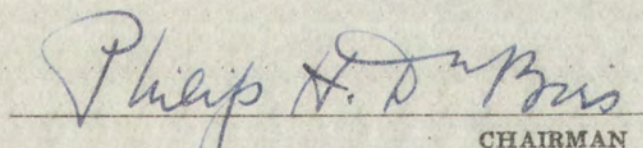
This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

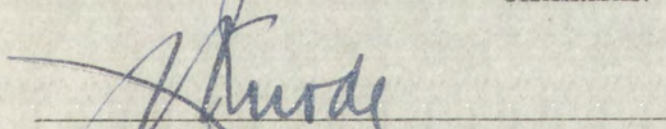
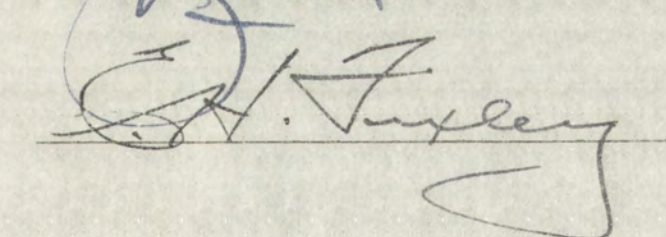
MASTER OF ARTS


DEAN


DATE

Thesis committee


CHAIRMAN

10/6/40 Distw 1.10

The thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

JEAN

DATE

Thesis Committee

CHAIRMAN

[Signature]

[Signature]

TABLE OF CONTENTS

CHAPTER	PAGE
I. REVIEW OF RELATED STUDIES	1
Importance of the Study	1
Review of Related Studies	2
II. THE PROBLEM	14
Statement of the Problem	14
Limitations of the Study	14
Definitions and Delimitations	15
Sources of the Data	17
Procedure	18
III. RESULTS	24
IV. STATISTICAL ANALYSIS OF CORRELATIONS	29
V. ANALYTICAL STUDY OF UNIVERSITY	
GROUP	38
VI. GENERAL CONCLUSIONS AND	
RECOMMENDATIONS	51
BIBLIOGRAPHY	53
APPENDIX	58

CHAPTER

I. REVIEW OF RELATED LITERATURE	1
II. THE PROBLEM	10
III. STATEMENT OF THE PROBLEM	15
IV. LIMITATIONS OF THE STUDY	20
V. DEFINITION OF TERMS	25
VI. SOURCES OF THE DATA	30
VII. PROCEDURE	35
VIII. RESULTS	40
IX. STATISTICAL ANALYSIS OF DATA	45
X. ANALYTICAL SUMMARY OF FINDINGS	50
GROUP	55
VI. GENERAL CONCLUSIONS AND RECOMMENDATIONS	60
RECOMMENDATIONS	65
BIBLIOGRAPHY	70
APPENDIX	75

LIST OF TABLES

TABLE	PAGE
I. Curriculum Choices of Students in the Different Schools	15
II. Scale for Transmuting High School and Col- lege Marks to Score Form	20
III. Scale for Transmuting X_1 to College Marks . . .	23
IV. Correlations by Subjects - School Groups . . .	25
V. Correlations by Subjects - University Group - Other Schools	27
VI. Data for Setting up Regression Equations for Total College Marks - Others	29
VII. Data for Setting up Regression Equations for Total College Marks - University	30
VIII. Data for Setting up Regression Equations for Different College Subject Marks - Others . . .	31
IX. Data for Setting up Regression Equations for Different College Subject Marks - Univer- sity	34
X. Correlations of Total High School Marks, Total College Marks and Total Test Scores with Psychological Test Scores - University . . .	38

LIST OF TABLES

TABLE	
I.	Correlation of Scores of Students in the Different Schools 15
II.	Scale for Transmuting High School and Col- lege Marks to Test Scores 20
III.	Scale for Transmuting College Marks 23
IV.	Correlations of Subjects - School Groups 25
V.	Correlations of Subjects - University Groups - Other Groups 27
VI.	Data for Setting up Regression Equations for Total College Marks - School 30
VII.	Data for Setting up Regression Equations for Total College Marks - University 33
VIII.	Data for Setting up Regression Equations for Different College Subject Marks - General 34
IX.	Data for Setting up Regression Equations for Different College Subject Marks - Univer- sity 36
X.	Correlations of Total High School Marks, Total College Marks and Total Test Scores with Psychological Test Scores - University 38

TABLE

PAGE

XI.	Correlations of Sub-tests with Total Psychological Test Scores and Total College Marks - University	39
XII.	Correlations Between College Subject Marks and Total High School Marks, Total Test Scores, Total Psychological Test Scores - University	41
XIII.	Data for Setting up Regression Equations for Total College Marks - University	43
XIV.	Data for Setting up Regression Equations for Scholastic Index - University	48

TABUL

12	Correlation of Sub-Test with Total Test - Cholera Test Scores and Total College	XI
13	Marks - University Correlation Between College Subject Marks	XII
14	and Total High School Marks, Total Test Scores, Total Psychological Test Scores -	XIII
15	University Data for Setting up Regression Equations for	XIV
16	Total College Marks - University Data for Setting up Regression Equations for	XV
17	Genetic Index - University	

CHAPTER I

REVIEW OF RELATED STUDIES

I. IMPORTANCE OF THE STUDY

Knowledge of the predictive value of high school marks, psychological test scores, and college placement test scores upon college academic success, as measured by college marks, is of importance to guidance officers and administrators in schools and colleges of New Mexico.

With large numbers of high school seniors entering colleges and institutions of higher learning it is of prime importance for high school principals, guidance officers, and teachers to be able to counsel the student on his probable success in college. It is hoped that this study will provide a basis for this guidance and prevent a waste of human effort, student time, and educational expense. This study is presented with the point of view that graduating high school seniors may be better advised as to their probable academic success upon entering college.

It is necessary to know the criteria upon which to base a predictive estimate that will enable college officials, deans, and guidance officers to classify entering college freshmen so that they may succeed to the best of their abilities. To college officials, deans, and guidance officers

CHAPTER I

REVIEW OF RELATED STUDIES

I. IMPORTANCE OF THE STUDY

Knowledge of the predictive value of high school marks, psychological test scores, and college placement test scores upon college academic success, as measured by college marks, is of importance to guidance officers and administrators in schools and colleges of New Mexico.

With large numbers of high school seniors entering colleges and institutions of higher learning it is of great importance for high school principals, guidance officers, and teachers to be able to counsel the student on his probable success in college. It is hoped that this study will provide a basis for this guidance and prevent a waste of human effort, student time, and educational expense. This study is presented with the point of view that graduating high school seniors may be better advised as to their probable academic success upon entering college.

It is necessary to know the criteria upon which to base a predictive estimate that will enable college officials, deans, and guidance officers to counsel entering freshmen so that they may succeed to the best of their abilities. To college officials, deans, and guidance officers

this study is presented in the hope that they may better guide the beginning college students in order that their college careers will be more profitable to themselves and the college, and more successful from an academic point of view.

II. REVIEW OF RELATED STUDIES

Many studies have been made concerning the elements that go to make up college success. The problem has been treated from both philosophical and statistical points of view.

Terman¹ correlated scores made on college placement tests, high school marks, college marks, and psychological test scores for students from twenty-five colleges.

Roberts, Root, Gowen and Gooch, Jordon, and others² made studies similar to this one in the 1920's.

Odell³ reported a study in 1927 on prediction of college success and reviewed studies made up to that time. The studies up to this time were of little significance except

¹Lewis M. Terman, "Intelligence Tests in Colleges and Universities," School and Society, 13:481-494, April 23, 1921.

²David Segel, Prediction of Success in College, Office of Education Bulletin No. 15. Washington, D. C.: United States Government Printing Office, 1934. pp. 98-104.

³Charles W. Odell, "Predicting Scholastic Success of College Freshmen," Bureau of Educational Research, No. 37. Urbana, Illinois: University of Illinois, 1937. pp. 1-54.

for exploratory and foundation work.

David Segel⁴ gives a resume of statistical studies made before 1934. He reports that the correlations between intelligence test scores and college marks vary from .20 to .70, the medians of the different groups varying from .38 to .58 depending on the test used. The correlations between college placement test scores or achievement tests and college marks vary from .43 to .75 and the medians vary from .46 to .59 depending upon the test used. The correlations between high school marks and college marks vary from .29 to .69 and the median is .55. Multiple correlations between all three variables are also reported. Correlations between college subjects and other criteria are given. Using from two to six criteria for predicting college success the multiple correlation coefficients vary from .56 to .81.

In 1932 Reeder⁵ reported a study made at Ohio University to determine the value of the high school rank, Ohio State Psychological test scores, entrance conditions and placement test scores in predicting academic success in the

⁴David Segel, Prediction of Success in College, Office of Education Bulletin No. 15. Washington, D. C.: United States Government Printing Office, 1934. pp. 98-104.

⁵C. W. Reeder, "Forecasting Academic Success in the College of Commerce and Administration," Bureau of Educational Research Bulletin No. 15:206-220. 1932.

for explanatory and formative work.

David G. Stoddard, Director of Educational Research

made before 1934. The report is a study of the

intelligence test scores of high school seniors

.70, the median of the distribution of scores being 100.

.58 depending on the test used. The correlation between

college placement test scores and high school

test scores was .52 and .58 for the two tests.

to .52 depending on the test used. The correlation between

high school test scores and college placement test

.58 and the median is .52. Multiple correlation between the

three variables is also reported. Correlation between col-

lege placement test scores and high school test scores

to six variables for prediction of college placement test

correlation coefficients were .52 to .58.

In 1935 Stoddard, et al. reported a study of the

study to determine the value of the high school test.

State Psychological Test Scores, and the correlation

placement test scores in predicting college placement test

David G. Stoddard, Director of Educational Research

of Educational Research, U. S. Department of Education

State Government Printing Office, 1935, p. 1-11.

U. S. Bureau of Education, Research in the

College of Education, University of Illinois, 1935.

U. S. Bureau of Education, Research in the

College of Commerce and Administration. The coefficients of correlation ranged from .47 to .65 and the conclusion was that predicting academic success was very uncertain, due to the human equation.

Daniel Harris⁶ reported a study made upon eight hundred men in the College of the City of New York in 1929 upon the relationship of some other factors than intelligence to marks in college and found that intelligence test scores were by far the largest influencing factor.

R. A. Fritz⁷ in 1933 reported a study using the A.C.E. psychological test and a teachers placement test as bases for predicting college marks and teaching success of students in a teacher's college. Between the psychological test scores and the teachers' aptitude test scores he found a correlation coefficient of .732. The former correlated with college marks gave a coefficient of .527 and the teachers' placement test correlated .629 with college marks.

Rhinehart,⁸ using the A.C.E. test scores as a basis

⁶Daniel Harris, "The Relation to College Grades of Some Factors Other Than Intelligence," Archives of Psychology, Vol. XX, No. 131. 1931-32. p. 49.

⁷R. A. Fritz, "Predicting College Marks and Teaching Success for Students in a Teacher's College," Journal of Applied Psychology, 17:439-466, August, 1933.

⁸J. B. Rhinehart, "An Attempt to Predict the Success of Student Nurses by the Use of a Battery of Tests," Journal of Applied Psychology, 17:277-293. June, 1933.

College of Commerce
control for the
that resulting
the same operation
United States
and men in the college
the relationship of
marks in college
by for the largest
R. A. Fisher in 1925

psychological test
predicting college
a teacher's college
and the teachers' college
correlation of
marks gave a correlation
best control for
United States

U.S.
Some factors other than
coll. coll. coll.
Factors for
Applied statistics
at students
of Applied statistics

for prediction of theory grades for forty-eight nurses in a nursing school, reported a coefficient of correlation of .618 in 1933.

H. Easley⁹ found low correlations between intelligence and achievement of 315 men at Duke University in 1933 and explained this low correlation as due to the lack of effort put forth by the men of high intelligence.

Edds and McCall¹⁰ found that high school marks were better than intelligence test scores, which in turn were better than English placement test scores for predicting scholastic success of eighty-five freshmen at Michigan College in 1933.

Garrett,¹¹ using 272 students, in 1934 reported a study of the predictive value of high school marks and found that the predictive value was not increased by including the first year high school marks. The subjects with highest predictive values were found to be English, mathematics, social

⁹ H. Easley, "On the Limits of Predicting Scholastic Success," Journal of Experimental Education, 1:272-276, March, 1933.

¹⁰ J. H. Edds and W. M. McCall, "Predicting the Scholastic Success of College Freshmen," Journal of Educational Research, 27:127-130, October, 1933.

¹¹ H. L. Garrett, "Predicting College Success Upon the Basis of High School Records," Peabody Journal of Education, 11:194-201, March, 1934.

science, and foreign language, in descending order of importance.

Johnston and Williamson¹² reported a study in 1934 from the University of Minnesota, where a college aptitude ranking is given students based on rank in high school and psychological test scores. The authors found this a very good basis for predicting college success and better than either of its component parts but stated that it might not apply to the same degree in other schools.

Asher¹³ in 1934 at the University of Kentucky found that psychological test scores have four and one-half times the weight of English test scores in predicting college marks for the first semester.

In 1934, Wagner¹⁴ found that for students from a large high school, high school marks were the best index for predicting college marks but for students from a small high school a battery of aptitude tests and psychological tests

¹²J. B. Johnston and E. G. Williamson, "A Follow Up Study of Early Scholastic Predictions in the University of Minnesota," School and Society, 40:730-738, December 1, 1934.

¹³E. J. Asher, "Relative Weights of Intelligence and English Tests in Predicting Grades," Kentucky Personnel Bulletin, No. 11. Lexington, Kentucky: University of Kentucky, 1934. 4 pp.

¹⁴M. E. Wagner, "Regents Grades as Cumulative Educational Records," School and Society, 40:367-368, September 15, 1934.

reference, and foreign language, in German literature, in 1934.
Lancet.

Johnson and Williamson¹⁸ reported a study in 1934
from the University of Illinois, where a college student
ranked in the top 10% of his class in English and
psychology. The student's record was a 4.0 in
good grades for psychology, English, and history. The
other of the two students who ranked in the top 10%
applied to the same degree in other subjects.

Johnson¹⁹ in 1934 at the University of Kentucky found
that psychological test scores were high and generally high
the weight of English test scores in grading college work
for the first semester.
In 1934, Johnson²⁰ found that for students from a large
high school, high school marks were the best index for pre-
dicting college marks and for students from a small high
school a pattern of aptitude tests and psychological tests

18. J. Johnson and E. C. Williamson, "A Study of
Study of High School Students in the University of
Illinois," *Journal of Educational Psychology*, 26:1-10, 1934.
19. J. Johnson, "Predictive Value of Intelligence and
English Tests in Predicting Success," *Journal of Educational
Psychology*, 26:1-10, 1934.
20. J. Johnson, "Predictive Value of Intelligence and
English Tests in Predicting Success," *Journal of Educational
Psychology*, 26:1-10, 1934.

afforded the best index for predicting college marks. The same year she reported several other studies on prediction. In one of these,¹⁵ a study of the marks made by 822 University of Buffalo students correlated with the Regents' Examination scores, which is a college placement test used in New York, the Regents' Examination was found to be the best index for predicting college success. Another study was made of the ease with which predictions could be made in the special subject fields from the Regents Examination. It was found that college marks could be predicted from the Regents' Examinations in the following order of facility: foreign language, English, social science, science, and mathematics.¹⁶

In a survey of the literature on prediction Wagner found that the average of high school marks was a better index than intelligence test scores for predicting college marks.¹⁷

Wagner and Strabel reported a study in 1935 which found that foreign language marks in college could best be

¹⁵ M. E. Wagner, "Prediction of College Success," University of Buffalo Studies, No. 9. 1934. pp. 124-144.

¹⁶ M. E. Wagner, "Prediction of Specific College Field and Course Performance," University of Buffalo Studies, No. 9. 1934. pp. 145-173.

¹⁷ M. E. Wagner, "A Survey of the Literature on College Performance Prediction," University of Buffalo Studies, No. 9. 1934. pp. 194-209.

estimated the cost of the work at \$100,000.

Some years ago the work was done by the

In one of these, the work was done by the

city of Baltimore, and the work was done by the

institution, and the work was done by the

New York, and the work was done by the

index for the work was done by the

made of the work was done by the

apical and the work was done by the

found that the work was done by the

Examination of the work was done by the

language, and the work was done by the

In the work was done by the

found that the work was done by the

for the work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

work was done by the

predicted from the language sub-test of the Regents' Examination.¹⁸

In 1935 they also reported a study on predicting science marks in college and found that college science marks could not be predicted with any fair amount of accuracy and that the different subjects in the science field required different criteria as indices, which indices were usually not in the science field.¹⁹ The two authors in conjunction also found that the homogeneous grouping of the students improved the predictive value of most all the criteria.²⁰

In 1937 Wagner and Strabel made a study of 661 students at the University of Buffalo and found that the Regents' Examination scores were the best index for predicting college English marks. They also found that the cooperative

¹⁸M. E. Wagner and E. Strabel, "Predicting Success and Failure in College Ancient and Modern Foreign Languages," Modern Language Journal, 19:285-293, January, 1935.

¹⁹M. E. Wagner and E. Strabel, "Predicting Success in the College Physical Sciences," Science Education, 19:4-9, January, 1935.

²⁰M. E. Wagner and E. Strabel, "Homogeneous Grouping as a Means of Improving the Predictions of Academic Success," Journal of Applied Psychology, 19:426-446, August 19, 1935.

English test scores were of almost the same value²¹ as were Regents' Examination scores in predicting English marks in college²².

In 1934 Watson reported on predicting college marks in the University of Kentucky from a scholastic index composed of high school scholarship, intelligence test scores, English achievement test scores and mathematics achievement test scores. It was found that to weight each variable properly it was necessary to multiply by .04, .2, .02, and .08 respectively.

In 1935 Fickens²³ at the University of Minnesota correlated high school marks and college grade point averages and found coefficients of .525 to .689, and Minnesota college aptitude test scores correlated with college grade point average yielded coefficients of .116 to .394.

Byrns and Henmon in 1935 made predictions from elementary school marks and intelligence quotients and corre-

²¹M. E. Wagner and E. Strabel, "Predicting Performance in College English," Journal of Educational Research, 30:694-699, May, 1937.

²²W. E. Watson, "Predicting First Semester Scholarship," Kentucky Personnel Bulletin, No. 10. Lexington, Kentucky: University of Kentucky. 1934. 4 pp.

²³C. E. Fickens, "Predicting Achievement in the Liberal Arts College," School and Society, 42:518-520, October 12, 1935.

English was the first language spoken in the colony.

Regiment, or military unit, was the first to be organized.

College.

In 1855, the first school was established in the colony.

In the history of the colony, the first school was established.

purpose of this school was to provide education for the children.

English school was the first to be established in the colony.

first school. It was founded in 1855, and was the first of its kind.

only to be replaced by a new school in 1855.

respectively.

In 1855, the first school was established in the colony.

closed high school was the first to be established in the colony.

found established in 1855, and was the first of its kind.

applied to the school in 1855, and was the first of its kind.

average school was the first to be established in the colony.

first school was the first to be established in the colony.

mainly school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

first school was the first to be established in the colony.

lated these with college marks actually made; this correlation gave a coefficient of .669.²⁴

Caudrey, in 1935, found that four years of high school marks was more closely related to Stanford scholarship standing than were college aptitude test scores.²⁵

Feder in 1935, after a study of prediction, drew the conclusion that predictions could not be made with a great degree of accuracy in individual cases but were of sufficient importance and weight to be used in guidance.²⁶

In 1935 Jones and Laslett, after a study of a group of five hundred students over a three to four year period of college work at Oregon State College, concluded that predictions made from high school marks and A.C.E. psychological test scores were satisfactory. They concluded that the high school marks furnished an index of industry and the psychological test an index of ability.²⁷

²⁴R. Byrns and V. A. C. Henmon, "Long Range Predictions of College Achievement," School and Society, 41:877-880, June 29, 1935.

²⁵K. M. Caudrey, "Entrance Qualifications and Stanford Scholarship," Faculty Bulletin No. 20, Stanford University, 1935. pp. 1-2.

²⁶D. D. Feder, "An Evaluation of Some Problems in the Prediction of Achievement at the College Level," Journal of Educational Psychology, 26:597-603, November, 1935.

²⁷G.A.A. Jones and H. R. Laslett, "Prediction of College Success," Journal of Educational Research, 29:266-271, December, 1935.

tested these with a series of tests...
 this gave a good measure of...
 Gardner, in 1937, found that...
 results were more clearly...
 the then were...
 -Tanner in 1938, after a study of...
 conclusion that...
 degree of...
 effect...
 In 1938...
 of five...
 college...
 found...
 best...
 school...
 logical...

24. R. Byrne and F. A. G. Gardner, "Some...
 of college achievement," *Journal of Educational Psychology*, 1937,
 28, 29, 1938.
 25. R. Gardner, "Factors...
 of achievement," *Journal of Educational Psychology*, 1937,
 28, 29, 1938.
 26. L. E. Tanner, "A...
 of achievement at the college level," *Journal of Educational Psychology*, 1938,
 29, 30, 1939.
 27. R. A. Jones and R. E. Tanner, "Prediction of...
 of achievement," *Journal of Educational Psychology*, 1938,
 29, 30, 1939.

Gladfelter in 1936, made a study of 120 students at Temple University on the use of A.C.E. psychological test scores, cooperative English test scores, and average high school marks in predicting college marks.²⁸

Paul²⁹ made a study of student mortality and scholastic standing in relationship to placement test scores.

Schmitz in 1937 found that A.C.E. psychological test scores, Army-Alpha test scores, Iowa Reading test scores, high school marks, and total scores on all tests were about equal in value for predicting college marks.³⁰

Dickter³¹ in 1937, found after six years of use and study that scholastic aptitude test scores were of use in predicting college marks in chemistry.

Dwyer, in 1937, found that high school marks were a better index of college marks for the high group of students

²⁸M. E. Gladfelter, "The Value of the Cooperative English Test in Prediction for Success in College," School and Society, 44:383-384, September 19, 1936.

²⁹J. B. Paul, "Relation of Placement Test Scores to Mortality and Scholastic Ratings," Bureau of Research, Cedar Falls, Iowa: Iowa State Teachers College, 1936. p. 17.

³⁰S. B. Schmitz, "Predicting Success in College: A Study of Various Criteria," Journal of Educational Psychology, 28:465-473, September, 1937.

³¹M. R. Dickter, "The Relationship Between Scores on the Scholastic Aptitude Test and College Marks in Chemistry," Journal of Experimental Education, 6:40-45, September, 1937.

than for the low group of students.³² Later in 1937 he reported the same findings for a different group.³³

Landry in 1937, found that predictions in the different fields were more restricted than were general predictions. He found that senior marks in high school were the best index of college marks and other indices were, in descending order of importance: verbal aptitude sub-test of college entrance examinations, examination board test, and mean of general college entrance board test scores. The weights of the different indices varied greatly for different subjects and different schools.³⁴

Drake and Henmon studied the predictive value of co-operative English test scores, Henmon-Nelson Mental Test scores, A.C.E. psychological test scores, and high school percentile rank and found that the latter was the best index and was changed only slightly by adding one, two, or all of

³²P. S. Dwyer, "The Use of Sub-correlation in the Analysis of Non-linear and Non-homoschedastic Correlation Charts," Journal of Educational Psychology, 28:541-547, October, 1937.

³³P. S. Dwyer, "The Use of Sub-correlations in Determining the Predictive Power of High School Grades," Journal of Educational Psychology, 28:673-680, December, 1937.

³⁴H. A. Landry, "The Relative Predictive Value of Certain College Entrance Criteria," Journal of Experimental Education, 5:256-260, March, 1937.

than for the first time in the history of the world.

During the past few years, the world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

experiencing a period of great change and

development. The world has been

the other three criteria.³⁵

Hoffman found that the predictive value of high school marks was relatively high.³⁶

Stella M. Swank at the University of New Mexico found a correlation of .302 between intelligence and college marks for the graduates from the University of New Mexico over a period of ten years.³⁷

Perry in 1934 studied several criteria from which college marks in mathematics might be predicted and set up prediction equations.³⁸

³⁵ L. E. Drake and V. A. C. Henmon, "The Prediction of Scholarship in the College of Letters and Science at the University of Wisconsin," School and Society, 45:191-194, February 6, 1937.

³⁶ W. S. Hoffman, "Predictive, Selective Admissions," School and Society, 45:829-831, June 12, 1937.

³⁷ Stella M. Swank, "Academic Achievement and Intelligence of Graduates of the University of New Mexico," unpublished Master's thesis, Albuquerque, New Mexico: University of New Mexico, 1932, 28 pp.

³⁸ Robert D. Perry, "Prediction Equations for Success in College Mathematics," Nashville, Tennessee: George Peabody College for Teachers, 1934, 58 pp.

CHAPTER II

THE PROBLEM

I. STATEMENT OF THE PROBLEM

In this study an answer to the following question will be sought: What relationship exists between high school marks, college placement test scores, and psychological test scores in predicting college academic success as measured by college marks and what weights can be assigned to each variable in predicting college marks?

II. LIMITATIONS OF THE STUDY

This study is limited in its scope because of the relatively small number of cases. There were 139 cases at the University and 154 cases in the combined groups outside the University (See Table I). The applicability of the findings of this study is lowered because of the institutional differences among colleges in New Mexico, the different types of curricula offered at each school, and the variability of high school and college marking systems.

The applicability of this study is further restricted because college marks used were for the fall term or semester only. High school marks cover the full number of units required for graduation.

In this study of the school situation
will be suggested that the school
school situation is a complex one
local school systems in the United States
measured by college and university
to each year in the United States

This study is a study of the
relatively small number of schools
the University and the University
the University of the United States
the University of the United States
the University of the United States
the University of the United States
the University of the United States

The study is a study of the
of the United States
of the United States
of the United States
of the United States
of the United States

III. DEFINITIONS AND DELIMITATIONS

The data are limited to college marks, test scores, and high school marks for those students who took the state-wide college placement tests given to New Mexico high school

TABLE I
CURRICULUM CHOICES OF STUDENTS
IN THE DIFFERENT SCHOOLS

	Univ.	State C.	Jr. C.	Norm.	Teach.	Totals
Arts & Sc.	64	37	10	8	4	123
Agri.		4	3			7
Educ.	18		13	12	12	55
Engr.	25	22	2			49
Fine Arts	9		11			20
Gen.	23					23
Comm.			10	1		11
Home Econ.			5			5
Totals	139	63	54	21	16	293

seniors in the spring of 1937 and who received college marks for the fall term or semester of 1937 at the University of New Mexico, New Mexico State College, Eastern New Mexico Junior College, New Mexico Normal University, or New Mexico State Teacher's College.

In this study the assumption is that all college and high school marks and test scores are valid.

Psychological test scores were obtained only for the

group of students who received marks at the University of New Mexico.

In this study the following terms are used in a special sense:

Test scores is taken to mean "scores made by students on the state-wide college placement tests given to the upper fifty per cent of high school seniors of New Mexico high schools cooperating in the program." Sub-test scores is taken to mean the "scores made on the separate parts of the test by students."

Psychological test scores is taken to mean "the raw scores made on the A.C.E. Psychological Examination, 1937 edition."³⁹

College marks is taken to mean "marks made by students in cooperating colleges in fall term or semester work 1937."

High school marks is taken to mean "marks made by students on high school subjects taken to earn the units of credit necessary for graduation and college entrance."

In partial and multiple correlations and in regression coefficients:

³⁹"Psychological Examination for High School Graduates and College Freshmen." Prepared by L. L. Thurstone and Thelma Gwinn Thurston: Published by the American Council on Education, 1937.

College marks are designated by 1.

High school marks are designated by 2.

Test scores are designated by 3.

Psychological test scores are designated by 4.

The University group is designated by U.

The group combined other than the University group is designated by 0.

The school groups are designated as follows:

University group by U.

State College group by S.

Teachers College group by T.

Normal University group by N.

Junior College group by J.

IV. SOURCES OF THE DATA

The personal data for each student, total test scores, and sub-test scores were taken from the original test forms.

High school marks were taken from files in the registrars' offices.

College marks were taken from files in the registrars' offices.

Psychological test scores were taken from files in the Psychology Department of the University of New Mexico.

V. PROCEDURE

In securing and treating the data the following procedure was followed:

Cards⁴⁰ six inches by eight inches were printed, having spaces for the following at the top: name of student, college, curriculum, date of birth, sex, high school, sub-test scores and total test scores. Spaces were left for any additional data needed.

The remainder of the card, which was printed width-wise, was divided into three equal columns. Two of these columns were devoted to high school marks and one to college marks.

The columns for recording high school marks were divided into groups of rows to conform as nearly as possible to the sub-test titles and transcript forms. These groups were English, mathematics, language, social science, science, agriculture, art, commercial subjects, home economics, journalism and public speaking. Names of the subjects were placed on rows in each group and extra spaces were left for any other subjects to be added. Spaces were provided in which to put the year in high school the subject was taken, number of periods per week, the length of periods and the

⁴⁰See Appendix A.

grade or mark made.

The column for recording college marks was divided as were the columns for recording high school marks, into groups of rows. These groups were orientation, English, mathematics, language, social science, science, engineering, commerce, home economics, and agriculture. The rows were not named here but left blank and in them was put the name of the department. Spaces were provided for the number of the course, hours of credit, and grade.

A list of the names of freshmen students who had taken the college placement tests and were enrolled at each of the five cooperating colleges was secured and each name, together with the college attended, was placed on a card. The original test forms were then sorted and the data at the top of the card transcribed from the test form to each student's card. Each card was then sent to the college where that student was enrolled and there the other data were recorded on the cards exactly as in the files of the registrars. Psychological test scores were taken from the files in the Psychology Department of the University of New Mexico for the University group.

When the cards were returned it was found that there were three separate systems of grading and parts of two others were different. A scale was devised to transmute the marks to a score of two significant digits in most cases.

Each college and high school mark was transmuted to a score. (See Table II). The subjects were rearranged if necessary so as to fall in their respective groups. The

TABLE II

SCALE FOR TRANSMUTING HIGH SCHOOL
AND COLLEGE MARKS TO SCORE FORM

High School and College Marks					Transmuted Score Based on Semester Hours or H.S. Credit		
					3	2	1
	98-99-100	A+		A+	6	4	2
E	94-95-96-97	A	A	A	12	8	4
	91-92-93	A-		A-	18	12	6
	88-89-90	B+		B+	24	16	8
G	84-85-86-87	B	B	B	30	20	10
	81-82-83	B-		B-	36	24	12
	78-79-80	C+		C+	42	28	14
M	74-75-76-77	C	C	C	48	32	16
	71-72-73	C-		C-	54	36	18
	68-69-70	P+		D+	60	40	20
P	64-65-66-67	P	D	D	66	44	22
		P-		D-	72	48	24
Cr.	WP	D	I	P E	84	56	28
	WF	E	F	F	102	68	34

NOTE: An A in a high school subject earning one credit will receive a score value of 4, while a three-hour course in college with a mark of A will receive a score of 12.

group grades were averaged and the total marks were averaged for both high school and college based on units of high school work or semester hours of college credit.

The cards were grouped according to the institution attended by the student and these groups were kept separate.

High school marks and college marks, high school marks and test scores, and college marks and test scores were correlated by the Pearson-product-moment formula. Correlations were computed for totals, English, mathematics, language, science, and social science for each of these sets.

Due to the small number of cases in many of the groups a correlation coefficient with a large P.E. resulted, which made the coefficient of insignificant value. Since only the University group was composed of a large number of cases (139), the other four groups were combined. In correlating high school marks and test scores all the groups were combined. All were not combined for other correlations because of institutional differences. Institutional differences, such as curricula, student body, and number of students made the results of the combined group less significant but it was used as a check on the University group.

To make a thorough study of the University group other correlations were made in that group only.

To determine the relationship between the three variables if intelligence were a factor, psychological test scores were correlated with total college marks, total high school marks, and total test scores.

Correlations were made of total high school marks, total test scores, and total psychological test scores with the college subject marks in English, social science, math-

High school students...
test scores, and...
led by the...
computer...
and social...
This is...
a correlation...
made the...
University...
the other...
school...
All were...
national...
curriculum...
of the...
as a...
...
correlations...
To...
...
...
school...
...
...
...
the...

ematics, and science. Correlations were made of total college marks, and total psychological test scores with sub-test scores in English, social science, mathematics, science, and language. Sub-test English scores were also correlated with sub-test mathematics scores so that the scholastic index now in use at the University might be checked.

From these zero order correlations first and second order partial correlations and multiple correlations were computed. To find the weight of each variable in predicting college success regression equations were set up. These equations are in two forms. The score form or X form is the practical form from which approximate marks in college may be predicted. The standard score form or z form is used to determine the weights of each variable in predicting college marks.

If the regression equations are to be used for practical purposes X_i representing college marks should have the following values; A--76, B--58, C--40, and D--22. (See Table III). This scale is necessary for interpreting the equations because the scale for transmuting high school and college marks (Table II) when used as a basis for securing correlation coefficients yielded negative coefficients which were treated as positive coefficients in this study.

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

...the ...

TABLE III
SCALE FOR TRANSMUTING X_1
TO COLLEGE MARKS

Value of X_1	College Mark
76	A
58	B
40	C
22	D

CHAPTER III

RESULTS

The results from correlating high school marks and college marks, high school marks, and tests scores, and college marks and test scores are presented in Table IV. Correlations were made within the different school groups separately for English, social science, mathematics, science, language, and totals.

Because of the small number of cases, the P.E. was very large in most instances other than in the University group, which renders the resulting coefficient of little or no value.

The correlation in language between high school marks and sub-test scores, and between college marks and sub-test scores is of very little consequence in any school groups, because the language sub-test is in reality another type of English test and was correlated with foreign language marks in high school and in college. In comparing the two sets of correlations for language, however, the correlation usually is higher between college marks and sub-test scores than between high school marks and sub-test scores, this is also true for English.

In general the correlation is higher between college

The results of the study
collected data, which showed that
large number of respondents
relationships were established
especially for the study
language, and the study
Because of the study
very large in the study
group, which represents the study
no value.
The correlation in the study
and self-rated study
score in the study
because the study
English test and the study
is high school and the study
correlation in the study
is higher between the study
between high school and the study
time for the study
In general, the study

TABLE IV
CORRELATIONS BY SUBJECTS - SCHOOL GROUPS

Sch.	Subj.	H.S. Marks and College Marks			H.S. Marks and Test Scores			College Marks and Test Scores		
		N	r	P.E.	N	r	P.E.	N	r	P.E.
U.	Eng.	121	.615	.040	139	.286	.053	121	.474	.047
S.		62	.320	.078	63	.502	.064	62	.593	.056
T.		15	.548	.125	16	.227	.175	15	.474	.140
N.		21	.636	.090	21	.162	.145	21	.689	.078
J.		51	.335	.082	54	.332	.082	51	.957	.008
U.	Soc. Sc.	86	.345	.065	139	.224	.054	86	.428	.060
S.		21	.249	.148	63	.227	.082	21	-.444	.115
T.		15	.240	.165	16	.588	.125	15	.530	.130
N.		20	.207	.139	21	.498	.110	20	.456	.123
J.		39	.160	.105	54	.256	.086	39	.208	.102
U.	Math.	57	.495	.068	139	.281	.052	57	.639	.054
S.		41	.157	.103	62	.403	.073	41	.382	.092
T.		6	.334	.200	16	.321	.150	6	-.109	.200
N.		4	-.138	.200	21	.282	.135	4	.805	.125
J.		7	.719	.109	54	.270	.086	7	.731	.130
U.	Sc.	97	.422	.054	138	.237	.054	98	.354	.060
S.		63	.453	.068	63	.332	.076	63	.597	.066
T.		13	.475	.150	16	.216	.155	13	.206	.180
N.		6	.169	.200	21	.258	.140	6	-.740	.120
J.		35	.473	.088	52	.221	.088	36	.140	.104
U.	Lang.	84	.551	.052	136	.184	.057	85	.225	.069
S.		16	.268	.160	54	.084	.092	18	.230	.150
T.		2			14	-.391	.155	3	.730	
N.		5	.556	.210	20	.684	.083	5	-.333	.200
J.		7	.145	.200	42	.005	.110	7	.461	.200
U.	Totals	139	.469	.444	139	.102	.056	139	.359	.050
S.		63	.528	.062	63	.254	.080	63	.478	.066
T.		16	.646	.100	16	.326	.151	16	.439	.187
N.		21	.404	.125	21	.574	.100	21	.450	.120
J.		54	.629	.056	54	.203	.090	54	.311	.083

and high school marks than for the other two pairs of variables in all the correlations except for mathematics and social science where the sub-test scores correlate higher with college marks than do high school marks with college marks or high school marks with sub-test scores.

The coefficients of correlation vary from $-.444$ to $.957$. The P.E.'s vary from $\pm .008$ to $\pm .200$. It is to be noted that unless the coefficient of correlation is four times its P.E. the coefficient is not to be regarded as statistically significant.

Since some of these correlations were of little or no significance all the groups other than the University group were combined and correlation coefficients computed for the groups combined and labeled Others (designated by 0). These data are presented in Table V. The University group and the other group were checked against each other and agree in general. The difference in the correlations in English is probably due to sectioning on the basis of the test results at the University. The section of Review English was taken out of the University group. Before it was taken out the correlation was $.317$ between high school marks and college marks, and was $.179$ between the college marks and sub-test scores.

The only large variation in the correlation of high school marks and college marks between the two groups is in

and high school students in all the various social sciences departments with college students in the field of psychology. The results of the study are as follows:

1. The results of the study show that the majority of the students in the social sciences departments are of the opinion that the study of psychology is of great value to the student.

2. The results of the study show that the majority of the students in the social sciences departments are of the opinion that the study of psychology is of great value to the student.

3. The results of the study show that the majority of the students in the social sciences departments are of the opinion that the study of psychology is of great value to the student.

4. The results of the study show that the majority of the students in the social sciences departments are of the opinion that the study of psychology is of great value to the student.

TABLE V
CORRELATIONS BY SUBJECTS
UNIVERSITY GROUP - OTHER SCHOOLS

Grp.	Var.	H.S. Marks and College Marks			H.S. Marks and Test Scores			College Marks and Test Scores		
		N	r	P.E.	N	r	P.E.	N	r	P.E.
U.	Eng.	121	.615	.040	139	.286	.053	121	.474	.047
O.		149	.464	.043	154	.451	.043	149	.536	.041
T.					293	.392	.033			
U.	Soc.	86	.345	.065	139	.225	.054	86	.428	.060
O.	Sc.	95	.248	.064	154	.224	.051	95	.231	.065
T.					293	.232	.036			
U.	Math.	57	.495	.068	139	.281	.052	57	.639	.054
O.		58	.469	.070	153	.338	.049	58	.379	.076
T.					292	.311	.038			
U.	Sc.	97	.422	.054	138	.237	.054	98	.354	.060
O.		117	.439	.054	152	.253	.055	118	.643	.038
T.					290	.236	.033			
U.	Lang.	84	.551	.052	136	.184	.057	85	.225	.069
O.		30	.304	.110	130	.009	.140	33	.060	.130
T.					266	.050	.039			
U.	Tot.	139	.469	.044	139	.102	.053	139	.359	.050
O.		154	.496	.041	154	.232	.052	154	.362	.047
T.					293	.155	.038			

NOTE: U designates the University, O designates the schools other than the University, and T designates the total of both groups.

language, which might be attributed to the fact that few students took foreign language in the schools other than the University.

The only significant difference of correlation results between the two groups in high school marks and test scores is found in the row of totals and here .102 $-$.056 is of little significance because of the large P.E.. Correlations in English vary somewhat, which may be due to the sectioning influence at the University. Correlations in mathematics vary quite appreciably in this group but may be due to curriculum choice. It is to be noted that correlations between marks in mathematics in the New Mexico State College and New Mexico State Teacher's College groups are quite high and significant.⁴¹

In the correlations between college marks and test scores there is much variation but none that may not be explained by curriculum choices of students and the type of students interested in the different subjects at the different schools.

In general it may be said that these zero order correlations are in agreement and check one another.

⁴¹See Table II.

language, which might be attributed to the fact that the students need foreign language in the school system than the University.

The only significant differences of composition results between the two groups in high school were not significant. It is found in the two of local and state tests. Little significant difference between the two groups in high school was not significant. In English very somewhat, which may be due to the section. The influence of the University. Correlation was not significant. Very quite significantly in this group but may be due to the section. It is to be noted that correlation between marks in mathematics in the New Mexico State College and the Mexico State College's College groups are quite high and significant.

In the correlation between college marks and high school marks, it is noted that correlation between marks in mathematics in the New Mexico State College and the Mexico State College's College groups are quite high and significant. In general, it may be said that there were no significant differences in the different subjects of the different groups.

41000 1000 1000

CHAPTER IV

STATISTICAL ANALYSIS OF CORRELATIONS

In treating the correlations in each group, prediction equations were set up for total college marks. Differences may be attributed to interests, schools, and students.⁴² In Table VI are presented the data from which further analytical study was made of the combined group composed of cases from all institutions other than the University, designated Others.

TABLE VI

DATA FOR SETTING UP REGRESSION EQUATIONS
FOR TOTAL COLLEGE MARKS - OTHERS

	1 College Marks		2 H.S. Marks		3 Test Scores	
Means	M ₁	40.65	M ₂	31.27	M ₃	163.64
Standard	SD ₁	13.97	SD ₂	9.53	SD ₃	33.71
Deviations	SD _{1,23}	11.601	SD _{2,13}	8.259	SD _{3,12}	31.60
Correlation	r ₁₂	.496	r ₁₃	.362	r ₂₃	.232
Coefficient	r _{12,3}	.454	r _{13,2}	.292	R ₁₍₂₃₎	.557
Regression						P.E. (est. X ₁)
Equations	$Z_1 = .435Z_2 + .261Z_3$ $X_1 = .727X_2 + 17.917$ $X_1 = .149X_3 + 16.268$ $X_1 = .637X_2 + .108X_3 + 3.057$					8.182 8.784 7.825

⁴²H. A. Landry, "The Relative Predictive Value of Certain College Entrance Criteria," Journal of Experimental Education, 5:256-260, March 1937.

In addition to the above, the following equations were used to determine the values of the various constants which may be determined from the experimental data. Table VI are presented the results of the study which were made of the various constants. All calculations were made with the aid of a slide rule.

Concentration of reactants	Rate of reaction	Order of reaction	Activation energy
0.10	0.001	1	10,000
0.20	0.002	1	10,000
0.30	0.003	1	10,000
0.40	0.004	1	10,000
0.50	0.005	1	10,000
0.60	0.006	1	10,000
0.70	0.007	1	10,000
0.80	0.008	1	10,000
0.90	0.009	1	10,000
1.00	0.010	1	10,000

TABLE VI
 Results of the study of the various constants

The same data are presented for the University group in Table VII.

TABLE VII
DATA FOR SETTING UP REGRESSION EQUATIONS
FOR TOTAL COLLEGE MARKS - UNIVERSITY

	1 College Marks		2 H.S. Marks		3 Test Scores	
Means	M_1	44	M_2	32.25	M_3	169
Standard	SD_1	14.82	SD_2	10.71	SD_3	38.52
Deviations	$SD_{1,23}$	12.24	$SD_{2,13}$	9.427	$SD_{3,12}$	35.836
Correlation	r_{12}	.469	r_{13}	.359	r_{23}	.102
Coefficient	$r_{12,3}$	.466	$r_{13,2}$	.354	$R_{1(23)}$	.564
Regression						P.E. (est. X_1)
Equations	$Z_1 = .331Z_2 + .413Z_3$					
	$X_1 = .635X_2 + 23.521$					8.650
	$X_1 = .135X_3 + 21.185$					9.141
	$X_1 = .495X_2 + .159X_3 + 2.326$					8.256

From a comparison we find that in both groups correlation coefficients between college marks and high school marks are changed only slightly when the test scores are partialled out or held constant. The correlations between high school marks and college marks remain between .40 and .50 and the correlation between test scores and college marks remains between .30 and .35. A rather large difference is shown, however, in the regression coefficients. For the Other group high school marks have about twice the weight of test scores in predicting total college marks. For the University group

high school marks have three-fourths of the weight of test scores in predicting total college marks.

In predicting marks in specific subjects it is found that there are slight institutional differences which may be due to the curriculum choices of the majority of the attending students. These data are presented in Tables VIII and IX.

By a careful study of these data it is found that the

TABLE VIII

DATA FOR SETTING UP REGRESSION EQUATIONS
FOR DIFFERENT COLLEGE SUBJECT MARKS - OTHERS

	1 College Marks		2 H.S. Marks		3 Test Scores	
<u>English</u>						
Means	M_1	40.81	M_2	33.06	M_3	47.86
Standard	SD_1	16.79	SD_2	11.41	SD_3	8.50
Deviations	$SD_{1,2,3}$	13.545	$SD_{2,1,3}$	9.73	$SD_{3,1,2}$	6.909
Correlation	r_{12}	.464	r_{13}	.536	r_{23}	.451
Coefficients	$r_{12,3}$	.295	$r_{13,2}$	.413	$R_{1(2,3)}$	.591
Regression						P.E. (est. X_1)
Equations	$Z_1 = .279Z_2 + .409Z_3$ $X_1 = .441X_2 + .809X_3 - 11.335$					9.136
<u>Social Science</u>						
Means	M_1	32.4	M_2	30.69	M_3	38.16
Standard	SD_1	13.95	SD_2	11.51	SD_3	8.92
Deviations	$SD_{1,2,3}$	13.278	$SD_{2,1,3}$	10.975	$SD_{3,1,2}$	8.541
Correlation	r_{12}	.248	r_{13}	.231	r_{23}	.224
Coefficients	$r_{12,3}$	.207	$r_{13,2}$	.186	$R_{1(2,3)}$	.307
Regression						P.E. (est. X_1)
Equations	$Z_1 = .206Z_2 + .185Z_3$ $X_1 = .250X_2 + .289X_3 + 13.699$					8.956

1

TABLE VIII (continued)

DATA FOR SETTING UP PREDICTION EQUATIONS
FOR DIFFERENT COLLEGE SUBJECT MARKS - OTHERS

<u>Mathematics</u>						
Means	M_1	46.05	M_2	31.26	M_3	41.41
Standard	SD_1	26.58	SD_2	11.63	SD_3	9.52
Deviations	$SD_{1,2,3}$	22.635	$SD_{2,3}$	10.074	$SD_{3,1,2}$	8.638
Correlation	r_{12}	.469	r_{13}	.379	r_{23}	.338
Coefficients	$r_{1,2,3}$	.391	$r_{1,3,2}$	.265	$R_{1(2,3)}$	.524
Regression	P.E. (est. X_1)					
Equations	$Z_1 = .384Z_2 + .248Z_3$					
	$X_1 = .878X_2 + .694X_3 - 10.135$					15.267
<u>Science</u>						
Means	M_1	45.3	M_2	31.68	M_3	29.37
Standard	SD_1	15.49	SD_2	12.37	SD_3	21.61
Deviations	$SD_{1,2,3}$	10.654	$SD_{2,3}$	10.747	$SD_{3,1,2}$	16.486
Correlation	r_{12}	.489	r_{13}	.643	r_{23}	.253
Coefficients	$r_{1,2,3}$	.440	$r_{1,3,2}$	.615	$R_{1(2,3)}$	.726
Regression	P.E. (est. X_1)					
Equations	$Z_1 = .348Z_2 + .554Z_3$					
	$X_1 = .436X_2 + .397X_3 + 19.828$					7.186

correlation of high school marks and college marks in English is decreased by partialing out the sub-test scores more than is the correlation between college marks and sub-test scores with high school marks held constant. In this case sub-test scores have about twice the weight of high school marks in predicting college marks. In social science, college marks may be predicted from either criterion with equal success, this may be noted by examining the zero order and first order correlation coefficients. In mathematics high school

1. The first part of the paper is devoted to a general discussion of the problem of the origin of life. It is shown that the problem is one of the most important and most difficult in the history of science.

2. The second part of the paper is devoted to a detailed discussion of the problem of the origin of life. It is shown that the problem is one of the most important and most difficult in the history of science.

3. The third part of the paper is devoted to a detailed discussion of the problem of the origin of life. It is shown that the problem is one of the most important and most difficult in the history of science.

4. The fourth part of the paper is devoted to a detailed discussion of the problem of the origin of life. It is shown that the problem is one of the most important and most difficult in the history of science.

marks are of slightly more weight (one and one-fourth times sub-test scores) in predicting college marks than are sub-test scores, which may be determined by examining the correlation coefficients.

In predicting college marks in science sub-test scores have almost twice the weight of high school marks.

The same data for the University group are shown in Table IX.

From a careful study of this table it will be seen that in English there is a high correlation of .615 between college marks in English and high school marks in English but when the sub-test scores are held constant this coefficient becomes .568. When the weights of the variables are found the sub-test scores in English have about six times the weight of high school marks in predicting college English marks.

In social science the correlation is greater between sub-test scores and college marks. The weight of high school marks in predicting college marks is about eight times the weight of sub-test scores.

In mathematics the correlation between sub-test scores and college marks is higher than the correlation between high school marks and college marks. In the regression equation the sub-test scores have almost twice the weight of high school marks in predicting college marks.

marks are of slightly more weight (one and one-fourth times sub-test scores) in predicting college marks than the sub-test scores, which may be determined by examining the correlation coefficients.

In predicting college marks in science sub-test scores have almost twice the weight of high school marks. The same data for the University group are shown in

Table IX.

From a careful study of this table it will be seen that in English there is a high correlation of .815 between college marks in English and high school marks in English but when the sub-test scores are held constant this coefficient becomes .523. When the weights of the variables are found the sub-test scores in English have about six times the weight of high school marks in predicting college English marks.

In social sciences the correlation is greater between sub-test scores and college marks. The weight of high school marks in predicting college marks is about eight times the weight of sub-test scores.

In mathematics the correlation between sub-test scores and college marks is higher than the correlation between high school marks and college marks. In the prediction equation the sub-test scores have almost twice the weight of high school marks in predicting college marks.

The correlation between high school marks and college marks is higher than between sub-test scores and college marks in science, and the weight of high school marks in predicting college science marks is greater than the weight of test scores.

Comparison of the two tables indicates that in English the sub-test scores have greater weight in predicting college marks than do high school marks. The wide variation

TABLE IX

DATA FOR SETTING UP REGRESSION EQUATIONS
FOR DIFFERENT COLLEGE SUBJECT MARKS - UNIVERSITY

	1 College Marks	2 H.S. Marks	3 Test Scores
<u>English</u>			
Means	M_1 45.82	M_2 30.65	M_3 49.3
Standard	SD_1 16.48	SD_2 14.08	SD_3 7.74
Deviations	$SD_{1,23}$ 11.938	$SD_{2,13}$ 11.103	$SD_{3,12}$ 6.814
Correlation	r_{12} .615	r_{13} .474	r_{23} .286
Coefficients	$r_{12,3}$.568	$r_{13,2}$.395	$R_{1(23)}$.689
Regression			P.E. (est. X_1)
Equations	$Z_1 = .522Z_2 + 3.250Z_3$		
	$X_1 = .611X_2 + .692X_3 - 7.023$		8.052
<u>Social Science</u>			
Means	M_1 44.36	M_2 31.23	M_3 41.15
Standard	SD_1 17.83	SD_2 13.39	SD_3 1.84
Deviations	$SD_{1,23}$ 15.451	$SD_{2,13}$ 12.515	$SD_{3,12}$ 16.55
Correlation	r_{12} .345	r_{13} .428	r_{23} .224
Coefficients	$r_{12,3}$.283	$r_{13,2}$.384	$R_{1(23)}$.499
Regression			P.E. (est. X_1)
Equations	$Z_1 = 2.621Z_2 + .394Z_3$		
	$X_1 = .349X_2 + .356X_3 - 113.157$		10.422

TABLE IX (continued)

DATA FOR SETTING UP REGRESSION EQUATIONS
FOR DIFFERENT COLLEGE SUBJECT MARKS - UNIVERSITY

<u>Mathematics</u>						
Means	M_1	45.55	M_2	34.48	M_3	28.5
Standard	SD_1	21.94	SD_2	14.05	SD_3	11.06
Deviation	$SD_{1,23}$	15.263	$SD_{2,13}$	12.18	$SD_{3,12}$	8.49
Correlation	r_{12}	.495	r_{13}	.657	r_{23}	.281
Coefficients	$r_{12,3}$	.427	$r_{13,2}$	.599	$R_{1(23)}$	.718
Regression	P.E. (est. X_1)					
Equations	$Z_1 =$	$3.426Z_2 + 5.424Z_3$				
	$X_1 =$	$.535X_2 + 1.076X_3 - 3.562$				10.295
<u>Science</u>						
Means	M_1	46.46	M_2	32.34	M_3	38.51
Standard	SD_1	20.22	SD_2	13.07	SD_3	12.59
Deviation	$SD_{1,23}$	17.554	$SD_{2,13}$	11.786	$SD_{3,12}$	11.712
Correlation	r_{12}	.422	r_{13}	.354	r_{23}	.237
Coefficients	$r_{12,3}$	.372	$r_{13,2}$	.288	$R_{1(23)}$	.496
Regression	P.E. (est. X_1)					
Equations	$Z_1 =$	$.358Z_2 + .268Z_3$				
	$X_1 =$	$.554X_2 + .431X_3 + 11.396$				11.84

between the two groups in sub-test score weights may be due to sectioning at the University.

College marks in social science may be predicted from high school marks with more accuracy than from sub-test scores. Here again there is a wide variation which may be due to the difference in technical schools and general schools.

In determining college marks in mathematics in the University group sub-test scores are of twice the weight of high school marks, but only three-fourths the weight of high

TABLE 1.1
 DATA FOR THE STUDY OF THE RELATIONSHIP BETWEEN
 COLLEGE MARKS AND HIGH SCHOOL MARKS - UNIVERSITY

Mathematics					
Mean	45.50	45.50	45.50	45.50	45.50
Standard Deviation	15.50	15.50	15.50	15.50	15.50
Correlation	.85	.85	.85	.85	.85
Coefficient of Determination	.72	.72	.72	.72	.72
Regression	$Y = 1.00X + 1.00$				
Residuals	$e_i = Y_i - \hat{Y}_i$				
	Y_i	\hat{Y}_i	e_i	e_i^2	$\sum e_i^2$
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.00
	45.50	45.50	0.00	0.00	0.

between the two groups in high school marks was not
 to determine if the University
 College marks in social sciences may be predicted from
 high school marks with some accuracy from first and last names.
 Here again there is a wide variation which may be due to the
 difference in technical schools and general schools.
 In determining college marks in mathematics in the
 University group and last names are of little weight.
 high school marks, but only first names are of little weight.

school marks in the Other group. Here again curriculum choice may be the cause of this difference.

There is little agreement between the two groups for predicting college marks in science. In the University group high school marks are about one and one-fourth times the weight of sub-test scores in science in predicting college marks in science. In the Other group science sub-test scores have about one and three-fourths the weight of high school marks for predicting college marks in science.

In summary it may be said that for predicting total college marks there is no agreement between the groups. In the University group high school marks and test scores have a weight ratio of about three to four in predicting college marks. In the Other group the weight ratio is about four to one in the same order.

College marks in English may be predicted with a greater degree of accuracy from sub-test scores than from high school marks, the weight ratio being about three to one.

Social science marks in college may be predicted to a greater extent from high school marks than from sub-test scores. The ratio of weights being from one and one-half to eight, to one.

In predicting mathematics marks in college there is no agreement. In the University group mathematics marks in college may be predicted from test scores and high school

marks on a rational basis of two to one. In the Other group college marks in mathematics may be predicted from high school marks and test scores on a rational basis of five to four. This difference may be due to the fact that those high school students who made good marks in mathematics attended a technical school rather than a general or liberal arts school.

In predicting college marks in science there is little agreement between the two groups. In the University group the marks may be predicted from high school marks and test scores on a rational basis of five to four. In the Other group the weights in the same order have a ratio of three to five. This variation may be explained by the difference in curriculum choices of students.

marks on a national basis of two to one. In the other group college marks in mathematics may be projected from high school marks and test scores on a national basis of five to four. This difference may be due to the fact that these high school students who made good marks in mathematics attended a special school rather than a general or liberal arts school. In projecting college marks in science there is little agreement between the two groups. In the University group the marks may be projected from high school marks and test scores on a national basis of five to four. In the other group the weights in the same order have a ratio of three to five. This variation may be explained by the difference in curriculum tables of students.

CHAPTER V

ANALYTICAL STUDY OF UNIVERSITY GROUP

It is assumed that the two large groups of data are in general similar. It is necessary, then, to study only one group. The University group was selected for this analytical study because the group was larger and it was possible to secure results on psychological tests for this group.

The psychological test scores were correlated with total college marks, total test scores, and total high school marks. The results from these correlations are presented in Table X.

TABLE X

CORRELATIONS OF TOTAL H. S. MARKS, TOTAL
COLLEGE MARKS, AND TOTAL TEST SCORES WITH
PSYCHOLOGICAL TEST SCORES - UNIVERSITY
N = 139

Variables	r	P.E.
Total College Marks and Psy. Test Scores	.407	.048
Total Test Scores and Psy. Test Scores	.800	.022
Total H. S. Marks and Psy. Test Scores	.115	.053

The high coefficient of correlation between psychological test scores and test scores indicates that the tests overlap in the abilities measured about sixty-four per cent.

In the case of the first group, the results of the study showed that the majority of the subjects were in the normal range. The second group, however, showed a higher percentage of subjects in the abnormal range. This difference was statistically significant. The results of the study are summarized in Table 1.

Table 1. Results of the study.

Group	Normal	Abnormal
First Group	15	5
Second Group	10	10
Total	25	15

The results of the study are consistent with the hypothesis that the first group is more likely to be in the normal range than the second group. This is due to the fact that the first group was more likely to be in the normal range than the second group.

To determine which sub-tests overlapped the psychological test to the greatest extent and what sub-tests correlated highest with total average college marks, the five sub-tests were correlated with total psychological test scores and with total college marks. These data are presented in Table XI.

TABLE XI

CORRELATIONS OF SUB-TESTS WITH TOTAL PSYCHOLOGICAL
TEST SCORES AND TOTAL COLLEGE MARKS - UNIVERSITY
N = 139

Subject	Sub-test and Total Psy.		Sub-test and Total College	
	r	P.E.	r	P.E.
English	.664	.032	.375	.049
Soc. Sc.	.663	.034	.480	.044
Math.	.621	.035	.269	.053
Science	.580	.037	.124	.056
Lang.	.564	.039	.318	.051

From these results it is seen that the English and social science sub-tests correlate highest with the psychological test, but that the other sub-tests also show substantial relationships with it.

In the correlations between sub-test scores and total college marks English sub-test scores have a slightly lower coefficient than when correlated with college English marks (.474). English sub-test scores when correlated with total

To determine the effect of the treatment on the growth of the plants, the following test was conducted. The plants were grown in a greenhouse under the following conditions: highest light intensity, highest temperature, and highest humidity. The results of the test are shown in the following table.

TABLE I. GROWTH OF PLANTS UNDER DIFFERENT CONDITIONS.

Subject	Height (cm.)		Weight (gms.)	
	Control	Treatment	Control	Treatment
Plant A	10.0	12.0	5.0	6.0
Plant B	8.0	10.0	4.0	5.0
Plant C	9.0	11.0	4.5	5.5
Plant D	7.0	9.0	3.5	4.5
Plant E	6.0	8.0	3.0	4.0

From these results it is seen that the treatment had a significant effect on the growth of the plants. The plants treated with the highest light intensity, highest temperature, and highest humidity grew taller and heavier than the control plants. This indicates that the treatment was effective in promoting plant growth.

Additional tests were conducted to determine the effect of the treatment on the yield of the plants. The results of these tests are shown in the following table.

TABLE II. YIELD OF PLANTS UNDER DIFFERENT CONDITIONS.

In the following table, the yield of the plants is given in grams per plant. The results show that the treatment had a significant effect on the yield of the plants. The plants treated with the highest light intensity, highest temperature, and highest humidity yielded more than the control plants. This indicates that the treatment was effective in increasing the yield of the plants.

college marks have a slightly higher coefficient than do total test scores when correlated with total college marks (.359). (See Table IV).

Social science sub-test scores have a higher correlation with the total college marks than with social science marks in college (.428). Social science sub-test scores also have a higher correlation with total college marks than do the total test scores (.359).

Mathematics and science sub-test scores both have lower correlation coefficients when correlated with total college marks than when correlated with mathematics marks in college (.639) and science marks in college (.354) respectively.

Language sub-test scores correlate almost as highly with total college marks as do total test scores (.359). Language sub-test scores correlated with language marks in college gives a coefficient of .225, which is the correlation between a form of English sub-test scores with foreign language marks in college.

To find which college subjects were most highly correlated with total high school marks, total test scores, and total psychological test scores, these three sets of correlations were computed. These data are presented in Table XII.

There is a higher correlation between total high school marks and college English marks, and total high school

marks and college social science marks than between test scores or psychological test scores and these same subjects. The correlation between high school English marks and college English marks (.615) is higher than the correlation between total high school marks and college English marks but the

TABLE XII

CORRELATIONS BETWEEN COLLEGE SUBJECT MARKS
TOTAL HIGH SCHOOL MARKS, TOTAL TEST SCORES,
TOTAL PSYCHOLOGICAL TEST SCORES - UNIVERSITY

	Total H.S. Marks Col. Subj. Marks			Total Test Sco. Col. Subj. Marks			Psy. Test Scores Col. Subj. Marks		
Subject	N	r	P.E.	N	r	P.E.	N	r	P.E.
English	138	.434	.046	121	.236	.057	138	.213	.056
Soc.Sc.	88	.396	.032	86	.395	.062	86	.251	.067
Math.	57	.427	.073	57	.521	.066	57	.463	.070
Science	98	.234	.064	98	.483	.052	98	.468	.056

coefficient of correlation between total high school marks and college social science is greater than the correlation between high school social science marks and college social science marks (.345). The correlation between social science sub-test scores and college marks in social science (.428) is higher than either of the above coefficients for social science.

Mathematics marks in college correlated with total test scores yields the highest correlation of this group. Math-

ematics marks in college correlated with mathematics sub-test scores give a coefficient of .639.

College marks in science are significantly correlated with the total test scores which is higher than any other coefficient computed between science marks in college and other criteria.

Sub-test mathematics scores were also correlated with sub-test English scores giving a coefficient of $.384 \pm .048$.

To find the relationship between all four variables, college marks, high school marks, test scores, and psychological test scores, partial correlations, multiple correlations, and regression coefficients were computed. (Table XIII).

The coefficient of correlation between college marks and high school marks is $.469 \pm .044$ and when test scores are held constant is .466. When psychological test scores are held constant it is .465 and when both test scores and psychological test scores are held constant it is .466.

The coefficient of correlation between college marks and test scores is $.359 \pm .050$ and when high school marks are held constant it is .354; but when psychological test scores are held constant it becomes .061. When both psychological test scores and high school marks are held constant the coefficient of correlation is reduced to .004.

The coefficient of correlation between college marks and psychological test scores is $.407 \pm .048$ and when high

1941

1942

1943

1944

1945

1946

1947

1948

1949

1950

1951

1952

1953

1954

1955

1956

1957

1958

1959

1960

1961

1962

1963

1964

1965

1966

1967

1968

1969

1970

TABLE XIII

DATA FOR SETTING UP REGRESSION EQUATIONS
FOR TOTAL COLLEGE MARKS - UNIVERSITY

	1 Col.Marks	2 H.S.Marks	3 Test Scores	4 Psy.T.Sco.
Means	M ₁ 44	M ₂ 32.25	M ₃ 169	M ₄ 164
Stand. Dev.	SD ₁ 14.82	SD ₂ 10.71	SD ₃ 38.52	SD ₄ 50.4
	SD _{1,23} 12.24	SD _{2,13} 9.427	SD _{3,12} 35.836	
	SD _{1,34} 13.509	SD _{2,34} 23.068	SD _{4,13} 29.538	
	SD _{1,24} 11.985	SD _{2,14} 9.419	SD _{4,12} 45.834	
	SD _{1,234} 11.721	SD _{2,134} 9.412	SD _{3,124} 23.095	SD _{4,123} 29.507
Corr.	r ₁₂ .469	r ₁₃ .359	r ₂₃ .102	r ₁₄ .407
	r ₃₄ .800	r ₂₄ .115	r _{12,3} .466	r _{13,2} .354
	r _{14,3} .214	r _{13,4} .061	r _{14,2} .402	r _{12,4} .465
	r _{34,2} .798	r _{24,3} .056	r _{23,4} .000	
	r _{14,23} .212	r _{12,34} .466	r _{13,24} .004	
	R ₁₍₂₃₎ .564	R ₁₍₂₄₎ .588	R ₁₍₃₄₎ .411	R ₁₍₂₃₄₎ .590
Regr. Equa.				P.E. (est. X ₁)
	Z ₁ = .331Z ₂ + .413Z ₃			
	Z ₁ = .094Z ₃ + 3.325Z ₄			
	Z ₁ = .321Z ₂ + .357Z ₄			
	Z ₁ = .419Z ₂ + .005Z ₃ + 2.862Z ₄			
	X ₁ = .635X ₂ + 23.521			8.650
	X ₁ = .135X ₃ + 21.185			9.141
	X ₁ = .117X ₄ + 24.812			8.946
	X ₁ = .459X ₂ + .159X ₃ + 2.328			8.256
	X ₁ = .592X ₂ + .105X ₄ + 7.688			8.084
	X ₁ = .036X ₃ + .978X ₄ - 122.476			9.112
	X ₁ = .580X ₂ + .002X ₃ + .842X ₄ - 113.131			7.906

school marks are held constant is reduced to .402. When test scores are held constant it is reduced still farther to .214, and when both high school marks and test scores are held constant it is reduced to .212.

The coefficient of correlation between high school

The following table shows the results of the examination of the specimens of the various species of the genus *Staphylinus* collected by Mr. J. C. Gahan, and deposited in the collection of the U. S. National Museum.

No.	Species	Length	Width	Height	Color	Habitat	Locality	Date	Collector
1	<i>Staphylinus</i>								
2	<i>Staphylinus</i>								
3	<i>Staphylinus</i>								
4	<i>Staphylinus</i>								
5	<i>Staphylinus</i>								
6	<i>Staphylinus</i>								
7	<i>Staphylinus</i>								
8	<i>Staphylinus</i>								
9	<i>Staphylinus</i>								
10	<i>Staphylinus</i>								
11	<i>Staphylinus</i>								
12	<i>Staphylinus</i>								
13	<i>Staphylinus</i>								
14	<i>Staphylinus</i>								
15	<i>Staphylinus</i>								
16	<i>Staphylinus</i>								
17	<i>Staphylinus</i>								
18	<i>Staphylinus</i>								
19	<i>Staphylinus</i>								
20	<i>Staphylinus</i>								
21	<i>Staphylinus</i>								
22	<i>Staphylinus</i>								
23	<i>Staphylinus</i>								
24	<i>Staphylinus</i>								
25	<i>Staphylinus</i>								
26	<i>Staphylinus</i>								
27	<i>Staphylinus</i>								
28	<i>Staphylinus</i>								
29	<i>Staphylinus</i>								
30	<i>Staphylinus</i>								
31	<i>Staphylinus</i>								
32	<i>Staphylinus</i>								
33	<i>Staphylinus</i>								
34	<i>Staphylinus</i>								
35	<i>Staphylinus</i>								
36	<i>Staphylinus</i>								
37	<i>Staphylinus</i>								
38	<i>Staphylinus</i>								
39	<i>Staphylinus</i>								
40	<i>Staphylinus</i>								
41	<i>Staphylinus</i>								
42	<i>Staphylinus</i>								
43	<i>Staphylinus</i>								
44	<i>Staphylinus</i>								
45	<i>Staphylinus</i>								
46	<i>Staphylinus</i>								
47	<i>Staphylinus</i>								
48	<i>Staphylinus</i>								
49	<i>Staphylinus</i>								
50	<i>Staphylinus</i>								
51	<i>Staphylinus</i>								
52	<i>Staphylinus</i>								
53	<i>Staphylinus</i>								
54	<i>Staphylinus</i>								
55	<i>Staphylinus</i>								
56	<i>Staphylinus</i>								
57	<i>Staphylinus</i>								
58	<i>Staphylinus</i>								
59	<i>Staphylinus</i>								
60	<i>Staphylinus</i>								
61	<i>Staphylinus</i>								
62	<i>Staphylinus</i>								
63	<i>Staphylinus</i>								
64	<i>Staphylinus</i>								
65	<i>Staphylinus</i>								
66	<i>Staphylinus</i>								
67	<i>Staphylinus</i>								
68	<i>Staphylinus</i>								
69	<i>Staphylinus</i>								
70	<i>Staphylinus</i>								
71	<i>Staphylinus</i>								
72	<i>Staphylinus</i>								
73	<i>Staphylinus</i>								
74	<i>Staphylinus</i>								
75	<i>Staphylinus</i>								
76	<i>Staphylinus</i>								
77	<i>Staphylinus</i>								
78	<i>Staphylinus</i>								
79	<i>Staphylinus</i>								
80	<i>Staphylinus</i>								
81	<i>Staphylinus</i>								
82	<i>Staphylinus</i>								
83	<i>Staphylinus</i>								
84	<i>Staphylinus</i>								
85	<i>Staphylinus</i>								
86	<i>Staphylinus</i>								
87	<i>Staphylinus</i>								
88	<i>Staphylinus</i>								
89	<i>Staphylinus</i>								
90	<i>Staphylinus</i>								
91	<i>Staphylinus</i>								
92	<i>Staphylinus</i>								
93	<i>Staphylinus</i>								
94	<i>Staphylinus</i>								
95	<i>Staphylinus</i>								
96	<i>Staphylinus</i>								
97	<i>Staphylinus</i>								
98	<i>Staphylinus</i>								
99	<i>Staphylinus</i>								
100	<i>Staphylinus</i>								

The following table shows the results of the examination of the specimens of the various species of the genus *Staphylinus* collected by Mr. J. C. Gahan, and deposited in the collection of the U. S. National Museum.

marks and test scores is $.102 \pm .056$ but when the psychological test scores are held constant it is reduced to $.000$. The measure of relationship between high school marks and psychological test scores is $.115 \pm .053$ but when test scores are held constant the measure of relationship is reduced to $.056$. The coefficient of correlation between test scores and psychological test scores is $.800$ and when high school marks are held constant is reduced to $.798$.

The coefficient of multiple correlation between college marks, high school marks and test scores is $.564$. The relationship of college marks to high school marks and psychological test scores gives a multiple coefficient of $.588$ but the relationship of college marks to test scores and psychological test scores gives a multiple coefficient of $.411$, which is very little higher than the zero order coefficient between psychological test scores and college marks ($.407$).

From the regression equations it is possible to predict college marks from any one, any two, or all three of the variables by using the score form. This equation will give the average college mark based on semester hours of credit.

From the z form of the regression equation it is possible to get the relative weights of each variable. When high school marks and total test scores are used in predicting college marks the ratio of weights is about three to four. When total test scores and psychological test scores are used

in predicting college marks the ratio of weights is one to thirty-three. When high school marks and psychological test scores are used in predicting college marks the ratio of weights is almost one to one.

The equality of weights of psychological test scores and high school marks and the difference in weights of psychological test scores and placement test scores, and the close similarity in weights of high school marks and test scores shows that the college placement test measures largely the same factor or factors as does the A.C.E. psychological test. Taken with high school marks, the college placement test scores are of more weight than are psychological test scores. In predicting college marks the college placement test is of greater weight than high school marks when the two are taken together.

The weights of high school marks, test scores, and psychological test scores is in the ratio of eight to one to fifty, when all three are taken together. When the college placement test and the psychological test are used together as a basis for predicting college marks the college placement test has very little weight.

The difference in the weights assumed by test scores and high school marks in predicting college marks in the combined group and the weights of the same factors in the University group is not to be taken as rendering either result

in predicting college marks the ratio of weight to score is thirty-three. When high school marks and psychological test scores are used in predicting college marks the ratio of weights is almost one to one.

The equality of weights of psychological test scores and high school marks and the difference in weights of psychological test scores and placement test scores, and the close similarity in weights of high school marks and placement test scores show that the college placement test measures largely the same factor or factors as does the I.Q. psychological test. Taken with high school marks, the college placement test scores are of more weight than are psychological test scores. In predicting college marks the weight of placement test is of greater weight than high school marks when the two are taken together.

The weights of high school marks, test scores, and psychological test scores in the ratio of weight to score is thirty-three, when all three are taken together. When the college placement test and the psychological test are used together as a scale for predicting college marks the college placement test has very little weight.

The difference in the weights assigned by test scores and high school marks in predicting college marks in the combined group and the weights of the same factors in the university group is not so taken as rendering either result

invalid. Several facts might tend to distort the results. In combining several groups into one the number of different methods of marking are increased. In combining several groups there is danger of skewing the curve of normal distribution one way or the other, which would cause the results to be skewed also in comparison with a group that closely follows the normal curve.

Since the results of the college placement tests and of psychological tests are used, at the University, in classifying and in sectioning entering students, a spurious factor might enter in comparing this group with the combined group.

For the purpose of this study the results of the correlations using the University group are considered valid because the group is large. Other correlations tend to point in the same direction, as do the correlations for totals.

It is the contention of this study, then, in defense of the thesis that the state-wide placement tests are of value in predicting college success, that a measure of intelligence or scholastic aptitude plus a measure of effort is the proper criterion for predicting college academic success.

Evidence in defense of this contention are the high correlations of college subject marks with total psychological test scores, the high correlation between the placement test scores and the psychological test scores, and the rel-

ative weights of each criterion in predicting separately and in conjunction with each other, college marks from the variables.

The ability required to make marks in college may be measured either by a psychological test or by the placement test almost equally as well. The same effort used in making marks in high school will be necessary in college. The best bases for predicting college marks, are high school marks and placement test scores together, or high school marks and psychological test scores together.

For the purpose of guidance in the University of New Mexico a scholastic index is used. The scholastic index is the sum of fifty per cent of the psychological test percentile, twenty-five per cent of the English sub-test percentile and twenty-five per cent of the mathematics sub-test percentile. The weights assumed by each variable are shown in Table XIV.

The correlation between college marks and the psychological test scores remains .407 (Table X). The correlation between psychological test scores and English sub-test scores is higher than the correlation between English sub-test scores and English marks in college or English sub-test scores and total college marks. The correlation between the mathematics sub-test scores and psychological test scores is almost as significant as the correlation between mathematics

active weights of each criterion in predicting university and
in conjunction with each other, college marks were
Tables.

The ability ratings to make marks in college were
measured either by a psychological test or by the placement
test almost equally well. The same effort was in making
marks in high school will be necessary in college. The best
basis for predicting college marks, the high school marks and
placement test scores together, or high school marks and
psychological test scores together.

For the purpose of guidance in the University of
Mexico a schematic factor is used. The correlation between
the sum of fifty per cent of the psychological test scores
and twenty-five per cent of the English and test scores
and twenty-five per cent of the mathematical and test
percentile. The weights assigned to each variable are shown
in Table III.

The correlation between college marks and the psycho-
logical test scores remains .407 (Table II). The correlation
between psychological test scores and English and test scores
is higher than the correlation between English and test
scores and English marks in college of English and test
scores and total college marks. The correlation between the
mathematical and test scores and psychological test scores is
almost as significant as the correlation between mathematical

sub-test scores and college mathematics marks and is about the same as between English sub-test scores and psychological test scores. The correlation between the scores made on the

TABLE XIV

DATA FOR SETTING UP REGRESSION EQUATIONS
FOR SCHOLASTIC INDEX - UNIVERSITY

1 Col.Marks 4 Psy.Test Sco. 3 S-Test Eng. 3 S-Test Math.								
Means	M ₁	44	M ₄	164	M _{3STE}	49.3	M _{3STM}	28.5
Stand.	SD ₁	14.52	SD ₄	50.4	SD _{3STE}	11.65	SD _{3STM}	8.72
Dev.	SD _{1.43STE3STM}		13.099		SD _{4.13STE3STM}		34.332	
	SD _{3STE.143STM}		8.597		SD _{3STM.143STE}		6.824	
Corr.	r ₁₄		.407		r _{13STM}		.269	
Coef.	r _{3STM4}		.621		r _{43STE}		.664	
	r _{3STE3STM}		.384		r _{13STE}		.375	
	r _{13STE.4}		.153		r _{13STM.4}		.023	
	r _{13STM.3STE}		.146		r _{14.3STE}		.226	
	r _{43STM.3STE}		.530		r _{3STM3STE.4}		-.048	
	r _{14.3STE3STM}		.179		r _{13STM.43STE}		.031	
	R _{1(43STE3STM)}		.431					
Regr.								P.E. (est. X ₁)
Equa.	Z ₁ =	.231Z ₄	+	.188Z _{3STE}	+	.035Z _{3STM}		
	X ₁ =	.448X _{3STM}	+	31.232				9.433
	X ₁ =	.467X _{3STE}	+	20.977				9.079
	X ₁ =	.117X ₄	+	24.812				8.946
	X ₁ =	.068X ₄	+	.235X _{3STE}	+	.059X _{3STM}	+	19.581
								8.835

two sub-tests is .384 but when psychological test scores are held constant it is reduced to -.048. The coefficient of correlation between college marks and psychological test scores (.407) is reduced to .179 when both sub-tests are held constant. The coefficients of correlation between col-

and last night the old one was removed and the new one was put in. The new one was a better one and it was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one. The new one was a better one than the old one.

lege marks and sub-test scores on mathematics and English are .269 and .375 respectively. When psychological test scores are held constant these coefficients are reduced to .023 and .153 respectively.

From the regression equations in X form we may calculate the probable college mark that will be made by any student. From the z form of the regression equation we get the relative weights of the variables. Psychological test scores, English sub-test scores and mathematics sub-test scores have a ratio of weight of about fifteen to twelve to two in predicting college marks.

When the scholastic index is used the weights would become fifteen to six to one respectively if scores were used. However, percentiles are used which are relative and no definite weights can be assigned to each factor. The scholastic index is not weighted to the best advantage since in the index as it is used, the mathematics sub-test score has the same weight as English sub-test scores which is not true of the relative weights in the regression equation. Psychological test scores have only twice the weight of either sub-test in the scholastic index, but in the regression equation it is not twice each of them. (Table XIV). Psychological test scores give a measure of almost the same factor or factors as does either of the sub-tests. This fact is noted in the partial correlations when psychological test scores

are held constant. A much better index where all the factors would contribute to the predictive value would be high school marks and total test scores or high school marks and psychological test scores.

In general it may be said that in conjunction with high school marks, test scores have a large weight in predicting college marks.

The college placement test measures to largely the same degree the factor or factors that are measured by the A.C.E. psychological tests.

In conjunction with high school marks test scores have more relative weight than do psychological test scores in predicting college marks.

The scholastic index in use at the University of New Mexico is not an index which is weighted in the best possible fashion but it may, nevertheless, be useful in determining those students who will most probably be unable to do work that is acceptable for a degree.

CHAPTER VI

GENERAL CONCLUSIONS AND RECOMMENDATIONS

1. The single factor assuming the greatest weight in predicting college marks is psychological test scores.
2. The college placement test measures largely the same factor or factors as are measured by the A.C.E. psychological test.
3. In the absence of psychological test scores the next best weight for predicting college marks is college placement test scores.
4. The two best criteria for predicting college marks are high school marks and college placement test scores. There is little difference in the relative weights of psychological test scores and placement test scores when taken in conjunction with high school marks in predicting college marks.
5. The scholastic index at the University of New Mexico is not, according to this study, weighted in the proper ratios, although the index as it is used may have predictive value.
6. For predicting college English marks the sub-test scores have about six times the weight of high school marks.
7. In social science high school marks have about

1. The first factor is the degree of socialization of the individual. This factor is measured by the degree of conformity to the norms of the society.

2. The second factor is the degree of individualism. This factor is measured by the degree of independence of the individual from the group.

3. The third factor is the degree of collectivism. This factor is measured by the degree of dependence of the individual on the group.

4. The fourth factor is the degree of individualism. This factor is measured by the degree of independence of the individual from the group.

5. The fifth factor is the degree of collectivism. This factor is measured by the degree of dependence of the individual on the group.

6. The sixth factor is the degree of individualism. This factor is measured by the degree of independence of the individual from the group.

7. The seventh factor is the degree of collectivism. This factor is measured by the degree of dependence of the individual on the group.

8. The eighth factor is the degree of individualism. This factor is measured by the degree of independence of the individual from the group.

9. The ninth factor is the degree of collectivism. This factor is measured by the degree of dependence of the individual on the group.

eight times the weight of sub-test scores in predicting college marks.

8. In mathematics sub-test scores have about twice the weight of high school marks in predicting college marks.

9. In science high school marks have about one and one-fourth times the weight of the sub-test scores in predicting college marks.

10. The state-wide college placement test is of benefit to guidance officers and administrators in both high schools and colleges for guiding students and predicting their probable success in college as measured by college marks.

11. The value of high school marks, placement test scores, and psychological test scores in predicting success are of most value in educational guidance in general and not for an accurate statement of future marks. The guidance is more nearly accurate in general fields than in specific subjects.

eight times the weight of the other two
collage marks.

5. In the collage mark, the weight of the white ink is about the same as the weight of the black ink.

6. In the collage mark, the weight of the white ink is about the same as the weight of the black ink.

one-fourth the weight of the black ink.
disting collage mark.

10. The collage mark is made of two parts: a black part and a white part.
parallel to the black part.

high schools and colleges for many years and was
the chief product of the collage mark.

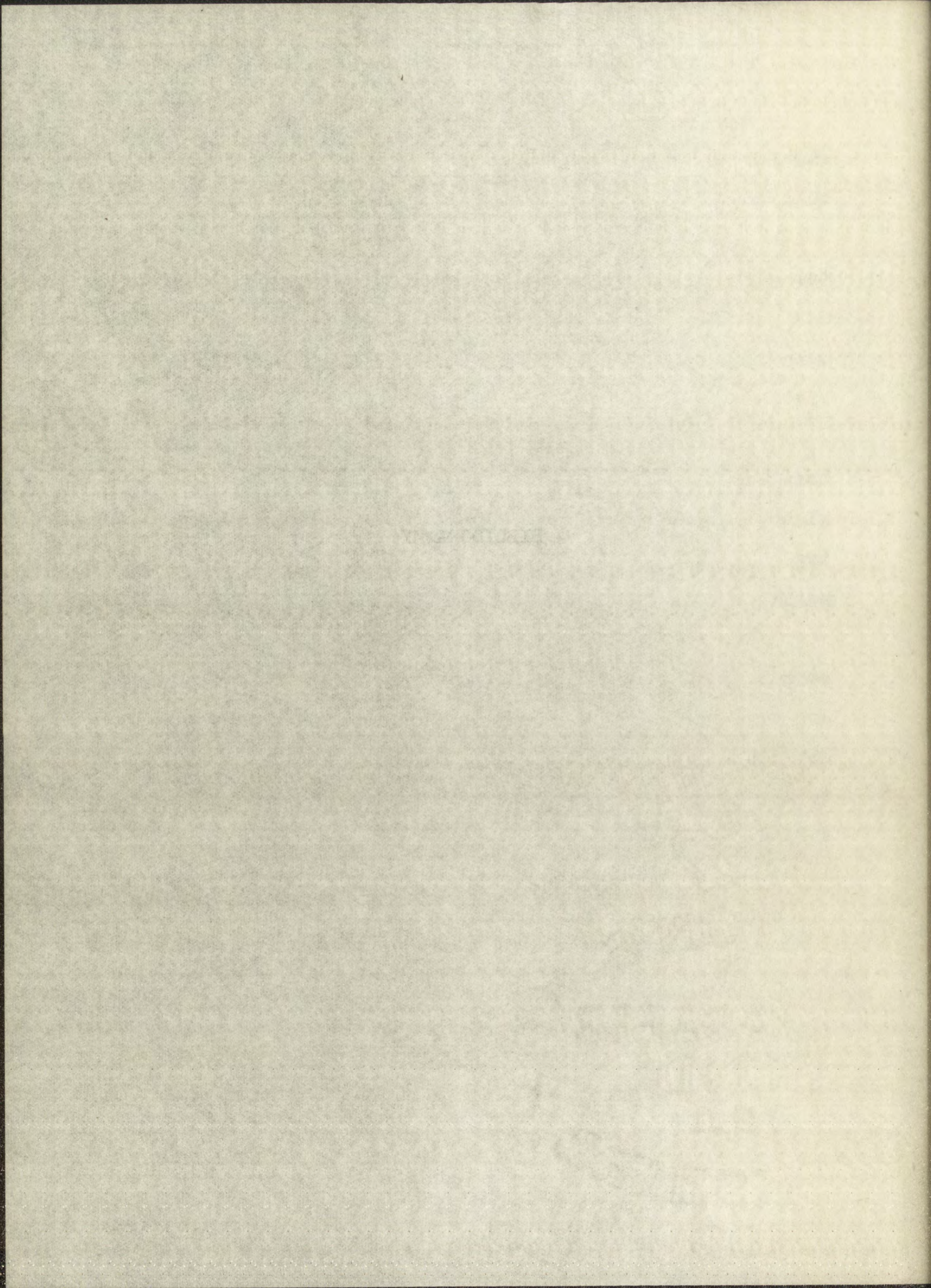
marks.
11. The collage mark is made of two parts: a black part and a white part.

across, and the white part is made of two parts: a black part and a white part.
are of most value to the collage mark.

not for an ordinary collage mark.
is more nearly a collage mark than the other two.

subject.

BIBLIOGRAPHY



BIBLIOGRAPHY

- Asher, E. J., "Relative Weights of Intelligence and English Tests in Predicting Grades," Kentucky Personnel Bulletin, No. 11. Lexington, Kentucky: University of Kentucky, 1934. 4 pp.
- Byrns, R. and V. A. C. Henmon, "Long Range Predictions of College Achievement," School and Society, 41:877-880, June 29, 1935.
- Campbell, William Giles, A Form Book for Thesis Writing, Los Angeles: University of Southern California Press, 1934. 145 pp.
- Caudrey, K. M., "Entrance Qualifications and Stanford Scholarship," Faculty Bulletin No. 20, Stanford University, 1935. pp. 1-2.
- Dickter, M. R., "The Relationship Between Scores on the Scholastic Aptitude Test and College Marks in Chemistry," Journal of Experimental Education, 6:40-45, September, 1937.
- Drake, L. E. and V. A. C. Henmon, "The Prediction of Scholarship in the College of Letters and Science at the University of Wisconsin," School and Society, 45:191-194, February 6, 1937.
- Dunlap, Jack W. and Albert K. Kurtz, Handbook of Statistical Nomographs, Tables, and Formulas, New York: World Book Company, 1932. 163 pp.
- Dwyer, P. S., "The Use of Sub-correlation in the Analysis of Non-linear and Non-homoschedastic Correlation Charts," Journal of Educational Psychology, 28:541-547, October, 1937.
- _____, "The Use of Sub-correlations in Determining the Predictive Power of High School Grades," Journal of Educational Psychology, 28:673-680, December, 1937.
- Easley, H., "On the Limits of Predicting Scholastic Success," Journal of Experimental Education, 1:272-276, March, 1933.
- Eds, J. H. and W. M. McCall, "Predicting the Scholastic Success of College Freshmen," Journal of Educational Research, 27:127-130, October, 1933.

THE UNIVERSITY OF CHICAGO

Admission to the University of Chicago is open to all who are qualified by their previous education and by their ability to do original research in the field of their choice.

For information regarding admission, please write to the Director of Admissions, University of Chicago, 5408 S. Ellis Avenue, Chicago, Illinois 60637.

The University of Chicago is a member of the Association of American Universities and the Association of Research Universities.

For a complete list of the departments and programs of the University of Chicago, please refer to the University of Chicago Catalog.

The University of Chicago is a member of the Association of American Universities and the Association of Research Universities.

For a complete list of the departments and programs of the University of Chicago, please refer to the University of Chicago Catalog.

The University of Chicago is a member of the Association of American Universities and the Association of Research Universities.

For a complete list of the departments and programs of the University of Chicago, please refer to the University of Chicago Catalog.

The University of Chicago is a member of the Association of American Universities and the Association of Research Universities.

For a complete list of the departments and programs of the University of Chicago, please refer to the University of Chicago Catalog.

The University of Chicago is a member of the Association of American Universities and the Association of Research Universities.

- Feder, D. D., "An Evaluation of Some Problems in the Prediction of Achievement at the College Level," Journal of Educational Psychology, 26:597-603, November, 1935.
- Fickens, C. E., "Predicting Achievement in the Liberal Arts College," School and Society, 42:518-520, October 12, 1935.
- Fritz, R. A., "Predicting College Marks and Teaching Success for Students in a Teacher's College," Journal of Applied Psychology, 17:439-446, August, 1933.
- Garrett, H. L., "Predicting College Success Upon the Basis of High School Records," Peabody Journal of Education, 11:194-201, March, 1934.
- Gladfelter, M. E., "The Value of the Cooperative English Test in Prediction for Success in College," School and Society, 44:383-384, September 19, 1936.
- Harris, Daniel, "The Relation to College Grades of Some Factors Other Than Intelligence," Archives of Psychology, Vol. XX, No. 131. 1931-32. p. 49.
- Hoffman, W. S., "Predictive, Selective Admissions," School and Society, 45:829-831, June 12, 1937.
- Johnston, J. B. and E. G. Williamson, "A Follow Up Study of Early Scholastic Predictions in the University of Minnesota," School and Society, 40:730-738, December 1, 1934.
- Jones, G. A. A. and H. R. Laslett, "Prediction of College Success," Journal of Educational Research, 29:266-271, December, 1935.
- Landry, H. A., "The Relative Predictive Value of Certain College Entrance Criteria," Journal of Experimental Education, 5:256-260, March, 1937.
- Odell, Charles W., "Predicting Scholastic Success of College Freshmen," Bureau of Educational Research, No. 37. Urbana, Illinois: University of Illinois, 1937. pp. 1-54.
- Paul, J. B., "Relation of Placement Test Scores to Mortality and Scholastic Ratings," Bureau of Research, Cedar Falls, Iowa: Iowa State Teachers College, 1936. p. 17.
- Perry, Robert D., "Prediction Equations for Success in College Mathematics," Nashville, Tennessee: George Peabody College for Teachers, 1934. 58 pp.

- Reeder, C. W., "Forecasting Academic Success in the College of Commerce and Administration," Bureau of Educational Research, Bulletin No. 15:206-220. 1932.
- Rhinehart, J. B., "An Attempt to Predict the Success of Student Nurses by the Use of a Battery of Tests," Journal of Applied Psychology, 17:277-293, June, 1933.
- Segel, David, Prediction of Success in College, Office of Education, Bulletin No. 15. Washington, D. C.: United States Government Printing Office, 1934. pp. 98-104.
- Swank, Stella M., "Academic Achievement and Intelligence of Graduates of the University of New Mexico," unpublished Master's thesis, Albuquerque, New Mexico: University of New Mexico, 1932. 28 pp.
- Schmitz, S. B., "Predicting Success in College: A Study of Various Criteria," Journal of Educational Psychology, 28:465-473, September, 1937.
- Terman, Lewis M., "Intelligence Tests in Colleges and Universities," School and Society, 13:481-494, April 23, 1921.
- Wagner, M. E. and E. Strabel, "Homogeneous Grouping as a Means of Improving the Predictions of Academic Success," Journal of Applied Psychology, 19:426-446, August 19, 1935.
- _____, "Predicting Performance in College English," Journal of Educational Research, 30:694-699, May, 1937.
- _____, "Predicting Success and Failure in College Ancient and Modern Foreign Languages," Modern Language Journal, 19:285-293, January, 1935.
- _____, "Predicting Success in the College Physical Sciences," Science Education, 19:4-9, January, 1935.
- Wagner, M. E., "Prediction of College Success," University of Buffalo Studies, No. 9. 1934. pp. 124-144.
- _____, "Prediction of Specific College Field and Course Performance," University of Buffalo Studies, No. 9. 1934. pp. 145-173.
- _____, "Regents Grades as Cumulative Educational Records," School and Society, 40:367-368, September 15, 1934.

Section 1. The purpose of this act is to provide for the better regulation of the business of the State of New York.

Section 2. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 3. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 4. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 5. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 6. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 7. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 8. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 9. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 10. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 11. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 12. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Section 13. The Board of Regents of the University of the State of New York is hereby authorized to make and alter the rules and regulations governing the conduct of the business of the State.

Wagner, M. E., "A Survey of the Literature on College Performance Prediction," University of Buffalo Studies, No. 9. 1934. pp. 194-209.

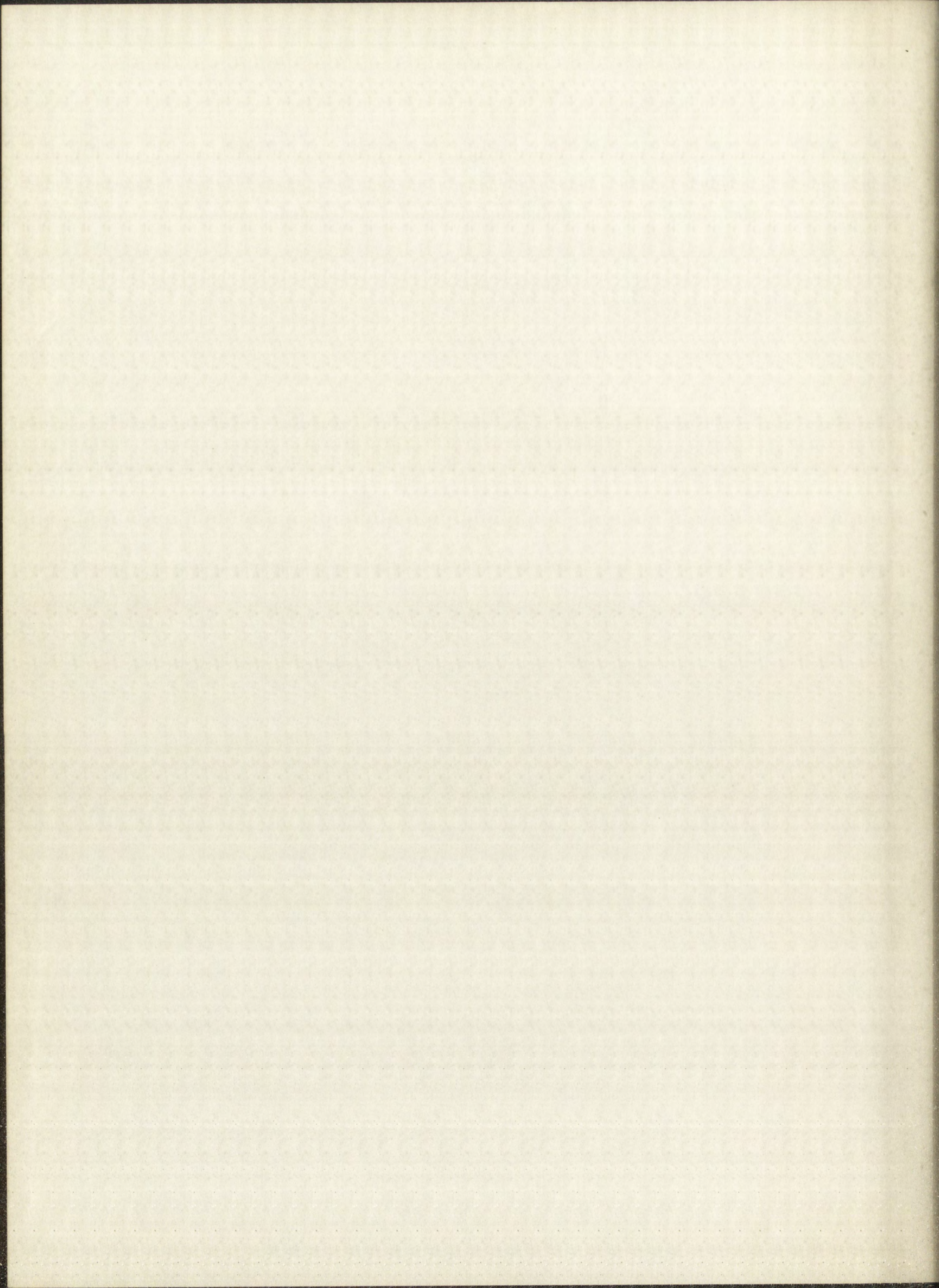
Watson, W. E., "Predicting First Semester Scholarship," Kentucky Personnel Bulletin, No. 10. Lexington, Kentucky: University of Kentucky. 1934. 4 pp.

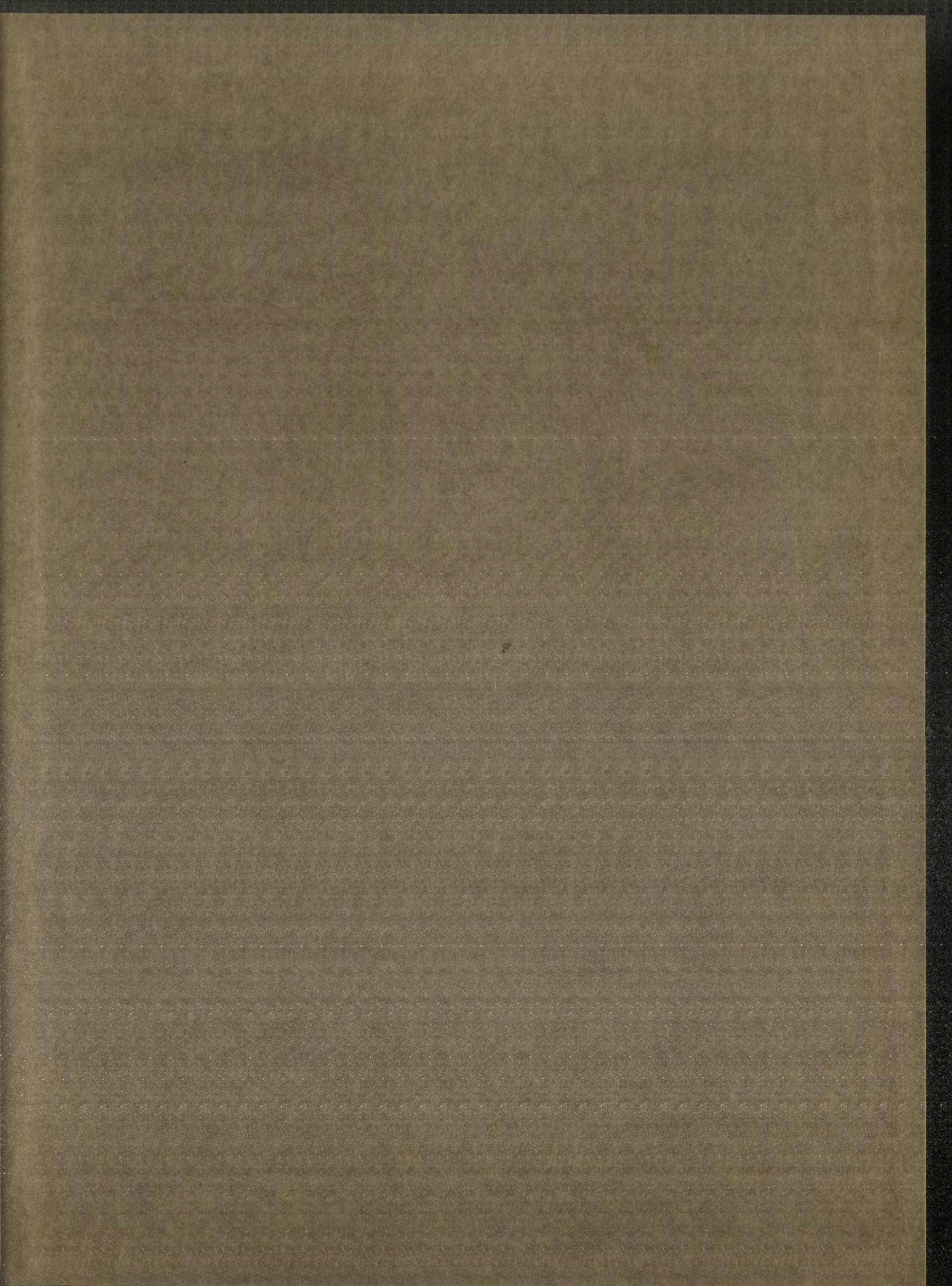
APPENDIX

APPENDIX A

CARD FOR SECURING DATA

NAME						Curriculum																					
Date of Birth				Sex		H. S.																					
Eng.		S. S.		Math.		Science		Lang.		T.																	
a		b		c		d		e		f																	
A		B		C		D		E		F																	
HIGH SCHOOL MARKS						COLLEGE MARKS																					
SUBJECT					Year	Per.	Lgth Per.	Grd.	SUBJECT				Year	Per.	Lgth Per.	Grd.	Dept.				No.	Hrs.	Grd.				
ENGLISH	I								SCIENCE	Biology								ORIENTATION									
	II									Zoology Botany								ENGLISH									
	III									Chem.																	
	IV									Gen. Sc.								MATH.									
MATH	Alg.								AGRI.	Geology Phys. Geog.									LANG.								
	Geom.									Physics																	
										Physiology																	
LANG.									Art									SOCIAL SCIENCE									
SOCIAL SCIENCE	Ancient History								COMMERCIAL	Arith.								SCIENCE									
	General Hist.									Law																	
	Med. & Mod. Hist.									B. Keep.																	
	English Hist.									Shorthand																	
	U. S. Hist.								HOME EC.	Type								ENGIN.									
	N. M. Hist. Civics																										
	U. S. Civics																		COMM.								
	Econ.																										
	Sociology								Journalism								HOME EC.										
									Public Spk.																		
																	AGRI.										





[illegible]

