COMPARATIVE SCHOLARSHIP AND TEST RECORDS OF MASTERS' AND BACHELORS' DEGREE STUDENTS AT KANSAS STATE COLLEGE

by

JAMES RALPH WELLS

B. S., Kansas State College
of Agriculture and Applied Science, 1928

A THESIS

submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE

Department of Education

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1941

TABLE OF CONTENTS

INTRODUCTION

Many educators believe that the privilege of receiving a master's degree should be granted only to those who are able to profit by it and that society should receive some social benefit from the fact that the degree was granted. To serve these two purposes, should graduate enrollment be restricted to students whose undergraduate performances were in some way superior? Do colleges already make such restrictions?

In a random sampling of the catalogues from fifty-four colleges and universities the requirements for graduate work divided the institutions into three groups. About sixty percent stated that the candidate must be a graduate from an approved college or university. About thirty percent added that the student would be admitted but must prove himself before he could be a candidate for the degree. A few had specific requirements. For example, the American University requires the student to have twenty-four hours of B credits in the field in which he expects to take his degree. Wheaton college requires one semester of residence before a student can be admitted to candidacy for a master's degree. Princeton grants the privilege of graduate study for only one year at a time and requires an examination in either French or German. Clark University requires the student to have more than average undergraduate ability. Yale requires two letters of

recommendation and a photograph.

A study of entrance requirements of thirty-two universities made by the Asscciation of American Universities, states that nine of them require grade averages of B or better. Three require B or better in various departments depending on the course the student is pursuing. Ten require an average undergraduate grade of C to B and ten made no specific grade requirements.

To study the relationship of scholarship and mental test records of graduate and undergraduate students at Kansas State College two comparable groups were selected. The graduate group which was designated as Group I consisted of students who had received a master's degree from Kansas State College within two years of the time they received the bachelor's degree, also from Kansas State College. Only those students who had received all their undergraduate and graduate credits at Kansas State College, and had taken the freshmen mental tests were included. A comparable group of students, designated as Group II, consisted of students who had received a bachelor's degree from Kansas State College, but had not received a master's degree from any college or university. Group II also did all their college work at Kansas State College including the freshmen tests.

REVIEW OF LITERATURE

Since no studies were found concerning the relationship

of graduate grades to undergraduate grades and to mental test scores, a review was made of a few studies concerning the correlations between high school grades and college grades, and the prediction of college grades from aptitude test scores and high school scholarship. Turber (5) found that two-fifths of the college sophomores and seniors ranked in the same quartile of scholastic performance in college as in high school. After entering college twice as many dropped into lower quartiles as advanced to higher quartiles. However, this may be merely a manifestation of statistical regression. Sixty-two percent of those later graduated were in the same quartile at graduation as in their sophomore year.

Adell (1) found a similar close relationship which he reported in the form of correlation coefficients. The highest correlation found was 0.779 between high school and college mathematics. English was next with 0.684. For all divisions combined the correlation was 0.743 between high school average grades and first semester college average grades. The correlation of 0.507 in the Division of Agriculture was the lowest, while the Division of Engineering had the highest which was 0.788. The student records involved in these correlations were those of Manhattan high school graduates who entered Kansas State College. These high correlations were attributed to the uniform grading standards used in the Manhattan high school. When records of a comparable group of 372 students selected at random from the whole

state were studied, the correlation dropped to 0.571. This lower correlation was attributed to the lack of uniformity of grading standards in the widely separated schools from which the control group was selected. Correlations were also made by Irwin (4) between Thorndike mental test scores and first semester college grades. The correlation between the mental test scores and first semester college grades was 0.612 while his correlation between high school grades and first semester college grades was 0.490 at Kansas State College.

At Stanford University as reported by Cowdery (2) there was a steady rise in aptitude test scores from 1924 to 1932 due to successively increasing degrees of selection. Removal of competitive or selective admission for three years resulted in a progressive lowering of aptitude scores during this period.

Assuming that college education is a preparation for leadership it is clear that the quality of the country's leadership is influenced by the caliber of high school graduates who are going to college. However, poor achievement in high school does not always indicate low intellectual capacity. Cowley (3) wrote, "it is impossible with the present instruments of measurements to reject students in the lower third of high school scholarship, without eliminating a large percentage of students who are likely to do successful

college work".

Since high school records and mental test scores do have considerable value for the prediction of college success of high school graduates, may it not be expected that test scores and college grades will be helpful in predicting success in graduate study?

The investigation of this problem is the purpose of this study.

PROCEDURE

The selection of Group I was made from lists of graduates in Kansas State College catalogues beginning with the year 1924 and ending 1940. The year 1924 was the earliest year that mental test scores were available for graduate students. All of the college credits of Group I were received at Kansas State College. The graduate and undergraduate grades were taken from the honor sheets in the Registrar's office. The honor points were figured by allowing three points for each hour of A, two points for each hour of B, one point for each hour of C, no points for each hour of D, minus one point for each hour of condition and minus two points for each hour of F. To get the average grade, the total of honor points was divided by the total credit hours in which the student had enrolled.

The percentile rank of each student included in this study was obtained from the records in the psychology office.

For more accurate and direct comparison the percentiles were converted to standard scores from appropriate tables. The date of high school graduation and the name of the high school of each member of Group I were taken from the honor sheets in the Registrar's office.

A group of undergraduate students desiganted as Group II was selected, so that each member of Group I was matched with a comparable member of Group II. The following controls were used in the selection of Group II: First, both members of each pair received the bachelor's degree in the same division and in the same year. Second, both members of each pair were graduated from approximately the same size high school located about the same distance from Manhattan. Third, the year of graduation from high school was the same for both members of each pair. Fourth, each member of Group II had also taken the freshmen mental test.

A tentative matching was made from catalogues using the address given. Sinc the place of graudation is not given in the catalogue, this list was taken to the Registrar's office where the time and place of high school graduation were verified. The grades were taken from the honor sheets and figured in the same manner as those of Group I. They were next checked for mental test scores which were converted to standard scores, since this group was to consist of students who did not get a master's degree from Kansas State College,

The lists were checked in the deans' offices and at the files in the Alumni office to eliminate any one who might have received a master's degree. This process was continued until each member of Group I was matched with a member of Group II.

The following correlations were computed: Group I, graduate grades and mental test scores, graduate grades and undergraduate grades, undergraduate grades and test scores. Group II, undergraduate grades and test scores.

FINDINGS

Variables

1. - Undergraduate grades
2. - Test scores
3. - Graduate grades

Table 1. Correlations

Number	Group I	Group II
r 12	0.579 PE 0.046	0.514 PE 0.051
r 13	0.636 PE 0.041	
r 23	0.449 PE 0.056	

The highest correlation found was 0.636 between graduate grades and undergraduate grades. The test scores correlated more closely with undergraduate grades than with graduate

grades. This difference might be caused by the longer time elapsing between the tests and graduate study than between the tests and undergraduate study.

Table 2. Performances of Group I

Variables	Mean	PEm	S. D. Dis.	Range
3	2.621	0.020	0.29	1.800 - 3.000
1	1.914	0.037	0.54	0.917 - 2.917
2	5.710	0.068	0.99	3.350 - 8.500

Table 3. Performances of Group II

Variables	Mean	PEm	S. D. Dis.	Range
1	1.593	0.040	0.56	0.721 - 2.888
2	5.550	0.053	0.84	2.950 - 7.330

Table 4. Comparison of Means

Groups	Difference	PEd	Critical ratio
I M_3 - I M_1	0.707	0.03	23.60
I M_1 - II M_1	0.321	0.054	5.90
I M_2 - II M_2	0.160	0.088	1.81

A comparison of the mean of Group I with the mean of Group II as computed from their mental test scores shows that there was only a slight advantage in mental ability of Group I over Group II when they entered college as freshmen. The critical ratio of 1.81 means that there are 89 in 100 chances that there is a difference in the means greater than zero in favor of Group I.

A comparison of the mean of the undergraduate grades of Group I with the mean of the undergraduate grades of Group II, gives a critical ration of 5.9 which means that there is a significant difference in favor of Group 1. A similar comparison of the graduate grades of Group I with their own undergraduate grades gives the unusually high critical ratio of 23.60.

Table 5. Rank of students on mental test.

Percentiles	Number of students	
	Group I	Group II
1 - 25	11	8
26 - 50	12	11
51 - 75	21	27
76 - 100	47	44
Total	91	91

Table 5 gives the rank of the students in both groups on the freshmen mental test. Fifty-two percent of Group I and forty-eight percent of Group II were in the upper quartile in mental ability when they entered college.

There were seventeen students in Group I who received all A's in their graduate work. The mean of the undergraduate grades of these seventeen students was 2.506 with the grades of two students under 2.000. The average grades of these students were 1.976 and 1.904. Every student in Group I received a higher grade in his graduate work than in his undergraduate work.

SUMMARY

1. There was little difference in mental ability of the two groups when they entered college.

2. The undergraduate grades of Group I were significantly higher than the undergraduate grades of Group II.

3. The graduate grades of Group I were significantly higher than their own undergraduate grades.

4. The highest correlation, which was 0.636, was between graduate grades and undergraduate grades.

5. Test scores were more highly correlated with undergraduate grades than with graduate grades.

6. No lower critical test score or undergraduate grade was found from which to predict successful graduate work.

7. Fifty-two percent of Group I were in the upper quartile in mental ability when they entered college.

8. Forty-eight percent of Group II were in the upper quartile in mental ability when they entered college.

ACKNOWLEDGMENT

Appreciation is expressed to Dr. J. C. Peterson, Professor of Psychology, for his criticism and advice in directing this study.

LITERATURE CITED

(1) Adell, H. E.
The value of homogenity of predicting college success from high school grades. Unpublished thesis. Kans. State Col. of Agr. and Appl. Sci. 29 p. 1931.

(2) Cowdery, K. M.
College aptitude test scores average. Faculty Bul. Stanford University. 20: 4. 1935. Abs. in Psychological Abstract. 9: 2448. 1935.

(3) Cowley, W. H.
Financial retrenchment and lower grade students. Jour. Ed. Res. 27: 230-434. 1934.

(4) Irwin, Ralph Alexander.
Predicting college success from mental test scores and cumulative scholarship records. Unpublished thesis. Kans. State Col. of Agr. and Appl. Sci. 28 p. 1929.

(5) Turber, C. H.
A critical analysis of the personal information blank in use at the State University of Iowa. School and Soc. 37: 327-329. 1931.