

Bulletin of University of Minnesota

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REPORT OF THE SURVEY COMMISSION X

STUDENT APTITUDE AND PREDICTION
OF STUDENT SCHOLARSHIP



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LETTER OF TRANSMITTAL

*President L. D. Coffman,
University of Minnesota.*

DEAR SIR: I am transmitting herewith a report of the results of investigation in the field of student aptitudes, dealing particularly with methods of predicting the performance of students who enter the college.

I recommend that this be published as Number X of the Survey Series.

Respectfully submitted,

J. B. JOHNSTON,
*Dean of the College of Science,
Literature, and the Arts*

FOREWORD

This report is issued as one of the survey numbers of the University of Minnesota. It is based upon a study of the selection and the progress of students in the University over a period of ten years. The various constructive suggestions which are made as a result of the study do not represent predetermined policies of the University. They are made rather as questions deserving of further consideration. The administrative officers of the University and a special committee, consisting largely of members of the teaching staff, have had these suggestions under consideration for several years and, as a result, some of them have already been introduced and are in use within the institution in modified form. The reorganization of the curriculum of the University, the readjustment of the administrative program, and the improvement of the instruction—all with the student's needs in mind—these we regard as the most important steps in our educational program.

L. D. COFFMAN

COLLEGE APTITUDE OF STUDENTS

INTRODUCTION

These studies were planned as early as 1915 and actively begun in 1917 when we gave the Army Alpha psychological tests to freshmen. The intention at the start was to discover whether accurate and reliable measures could be devised which would serve as a basis for deciding in advance whether it is wise for a given boy or girl to enter upon college work, and for giving prospective students sound advice. In a state university such decisions could be made only in full consideration of the accepted policy under which all graduates of accredited high schools are granted the right to enter the university. The investigation necessarily had as its object the study of the grounds for this policy in the character and ability of students and had as its possible outcome proposals for changes in that policy. It has been assumed that in the interests of the University and of the state any changes proposed should conform to these principles:

1. They should be gradual in their operation and subject to recheck from time to time;
2. They should at every point take into account the interests of the individuals concerned; and
3. They should be part of the broad adjustments of higher educational policy in view of the changing conditions.

PERIOD AND MATERIALS OF THE STUDY

The studies have dealt with freshmen entering in the fall of the years 1916-17, 1917-18, 1918-19, 1921-22, 1922-23, 1923-24, 1924-25, 1925-26, and 1926-27.

The total number of students in the groups studied have been as follows: by years 310, 367, 581, 435, 280, 315, 410, 397, 805; total 3,900. Beginning with the year, 1921-22, about 400 a year, or a total of 2,642, have been under observation during a period of six years or less by essentially the same method. These numbers are larger than have been used in most experimental studies with psychological tests (e.g., in Columbia, Brown, Stanford universities).

The groups studied were made up as follows:

1. Native born white graduates from the high schools of the Twin Cities graduating in June and entering this college the following September,
2. For the year 1926-27 an additional group graduating from the following high schools of this state and from other schools in this and other states:

a. Public high schools at:

Albert Lea	Excelsior	Grand Rapids	Owatonna
Alexandria	Fairmont	Hopkins	Red Wing
Anoka	Faribault	Little Falls	St. Cloud
Austin	Fergus Falls	Mankato	Stillwater
Brainerd			Winona

b. Private secondary schools:

Shattuck	St. Joseph's Academy, St. Paul
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The schools which have been selected for study have been simply those which were most convenient and no statement of the results should be considered as in any way a criticism of any school.

SELECTION OF STUDENTS AT PRESENT

Students at the University of Minnesota are self-selected from the graduates of accredited high schools. How this selection takes place in relation to the scholastic attainment of the students in the high schools is shown in Table I.

TABLE I
VOLUNTARY SELECTION*

High School Percentile Rank	Total High School Graduates					
	Men			Women		
	Total	Number entering college	Per cent	Total	Number entering college	Per cent
91-100	156	67	42.9	380	129	34.0
81- 90	174	71	40.8	361	85	23.6
71- 80	189	83	44.0	341	70	20.2
61- 70	228	89	39.0	302	64	21.2
51- 60	221	68	30.8	305	61	20.0
41- 50	244	69	29.0	283	53	18.7
31- 40	253	81	32.0	282	44	16.0
21- 30	296	95	32.0	240	35	14.6
11- 20	290	80	28.0	237	36	15.0
1- 10	292	73	27.0	228	37	16.3
	2,343	776	Av. 33.+	2,959	614	Av. 20.7

* Occurring between the high schools of Minneapolis and St. Paul and the University of Minnesota during the years 1922, 1923, and 1924.

The table is to be read as follows: the 10 per cent of the students having the highest marks in high school included 156 men and 380 women. Of the 156 men 67, or 42.9 per cent, and of the 380 women 129, or 34 per cent, entered the college. It is obvious from this table that (a) girls get higher grades than boys in high school, (b) that more boys come to college from the lowest rank of the high school classes than from the highest, and (c) that for both boys and girls the college entrants are to a slight degree selected from the upper scholastic levels.

CRITERIA EXAMINED

The following sources of information have been considered in the course of these studies.

1. *Subjects studied in high school.*—This was the first matter examined. No connection was discovered between differences in college performance or achievement and the studies pursued in high school that would enable any prediction to be made.

2. *Proportion of advanced studies carried in the high school.*—Studies of a group which entered in 1916 showed that the percentage of failure among those

who presented at entrance a small amount of advanced work was twice as great as for the whole group. Of the 1918 group the half which presented less than the average of advanced studies secured just two thirds of the failures in college.

3. *Rank of student in graduating class.*—Marks are of little value as comparative measures. Marks vary greatly from teacher to teacher and from school to school. It was early discovered that great differences occur between schools in the same city under the same supervision. Information that the student is in the highest one fourth or the lowest one fourth is of considerable value but in order to secure the highest degree of reliability in prediction it is necessary to have the individual rank of the student in his entire graduating class. For convenience of comparison of students from different schools this rank is converted into a *percentile rank*.

Predictive value of high school rank determined by comparison with college performance.

a. In 1921-22 the high school rank used was only the relative rank of those students from each school who entered the college. Of those the ones who made up approximately the lowest one fourth made the following records in the freshman year:

Average standing:

F	D	C	B	A
49	47	8	1	.. = 105
				Total group studied 435

That is to say, about 9 per cent of those in this lowest one fourth did satisfactory work in the freshman year. Satisfactory work means an average of C or higher.

b. For the years 1923-24, 1924-25, and 1925-26, those of our freshmen who ranked in the lowest one fourth of the Twin City high school classes made the following records in the freshman year:

Average standing:

F	D	C	B	A
92	83	4	..	.. = 179

For these years 2.23 per cent of those coming from the lowest one fourth of the high school classes did satisfactory work in the freshman year.

For the same years those who came from the highest one fourth of the same high schools made the following records in freshman year:

Average standing:

F	D	C	B	A
7	88	190	89	1 = 375

Of this group almost 75 per cent did satisfactory work.

The college records of students are compared with their high school ranks in Tables II, III, and IV.

4. *College aptitude (psychological) tests.*—For comparison with the above statement about high school marks, the tests used in 1921-22 with the same students gave the following results:

About 20 per cent having the lowest ranks in psychological tests made the following record in freshman year:

Average standing:

F	D	C	B	A
36	36	9	..	.. = 81

That is, about 11 per cent of those in the lowest one fifth of the psychological tests did satisfactory work in the freshman year.

For the years 1923-24, 1924-25, and 1925-26 the Twin City students who ranked in the lowest 25 percentile in the freshman psychological tests made the following records in the freshman year:

F	D	C	B	A
79	141	34	..	.. = 254

That is, 13.4 per cent of those in the lowest one fourth of our freshmen in the tests did satisfactory work.

The Twin City students for these three years who stood in the highest one fourth of the freshmen on the tests made the following records in college:

F	D	C	B	A
17	90	140	68	1 = 316

That is, 66 per cent of these did satisfactory work.

It should be noticed that in the above figures for high school rank each student is compared with the other members of his own high school class, while for the tests each student is compared with all freshmen taking the tests the same year.

The college records of students are compared with their ranks in the college ability tests in Tables V, VI, and VII.

5. *English essays and tests in English.*—Ability in the use of English in general goes with ability to do satisfactory college work. As criteria for the purpose here sought these data do not add much to the information received from the high school record and the psychological tests. Confirmation of the reliability of tests in English is found in the fact that in the years 1923-24 and 1924-25 only about 10 per cent of those who were assigned to subfreshmen rhetoric secured C grades in their other college studies.

6. *Ratings by teachers or principals.*—Data from this source are not yet dependable. Some individuals make accurate estimates of their students but most teachers and principals (a) see too little difference between their students and (b) value their students too highly. For example it is common for a principal to estimate that all but a few of his students will do college work above the average.

With further experience teachers and principals can learn to make estimates that will be helpful.

7. *Activities and interests of the student during his high school course.*—These facts offer information that is helpful in advising students because they give some indication of the attitude and efforts to be expected from a given student. Their value in prediction is a subject for further study.

8. *Education and occupation of parents and of older brothers and sisters.*—These facts also are helpful in advising.

CRITERIA EMPLOYED IN PREDICTING COLLEGE PERFORMANCE

The criteria which have been found reliable are *combined ratings* based on high school ranks and ranks in college ability tests. Careful examination of individual cases in the classes of 1921 and 1922 showed that most of the erroneous predictions based on either one of these factors could be corrected by taking the other factor into account. By combining the two ratings the error in prediction

in 1921 was reduced from 9 per cent to 3.54 per cent. In later studies the tests were improved and the high school ranks were obtained for all members of the graduating class. These improvements reduced the error in prediction to about 1.5 per cent of those for whom failure would be expected. Tables VIII and IX show the comparison between these combined ratings and the performance in college for the three years, 1923, 1924, and 1925. The tables represent actual prediction at the time of matriculation.

These tables show that out of 1,088 students the prediction was made that 208 would fall below an average of C in their college studies. Of these 208 three men and no women secured an average of C.

Two other tables (X and XI) show the correlation between the combined ratings and the scholarship throughout a four-year period for the group which entered in 1921. It is to be noted that a high correlation exists between the predictive ratings and the length of residence and that no student graduated or made four years' progress in a professional course whose rating was below the "threshold of ability." Those who made four years' progress with scholarship marks of D plus were in schools which do not require the average of C. The combined ratings are evidently a good measure of ability for the four-year course as well as for the first one or two years.

The tables for 1922-23 are placed at the end because the conditions were peculiar in that year and the large proportion of students with low marks is not typical.

A sharp distinction should be recognized between these studies and most other studies made on entrance requirements. In colleges and universities generally when entrance requirements are set up the institution learns nothing of the college performance of *those who are refused admission*. Here, we have applied purely hypothetical criteria and have examined the performance of those who would have been excluded as well as that of those who would have been admitted. Similar experiments have been conducted in Columbia, Brown, and Stanford universities. In Brown and Stanford, following the publication of our earlier studies, trial was made of combining high school records with the Thorndike tests. Using the Thorndike tests alone Brown University found that 40 per cent of those scoring below 60 secured an academic average above 70; 23 per cent secured an academic average above 75, and 3.8 per cent secured average grades above 80. In Stanford University, of students who received a Thorndike score below 60 at entrance, 25 per cent secured an average academic standing of C; 4 out of 63 students securing C plus and one B minus. Of the students whose Thorndike score was below 50 also 25 per cent secured an academic standing of C. At both these universities the combination of the high school record with Thorndike tests improved the correlation with college scholarship.

FAILING STUDENTS NOT PREDICTED BY THE ABOVE TABLES

Two things of interest are noticeable in Tables VIII and IX. First, that more than half of the students with unsatisfactory records have aptitude ratings above the level of the horizontal line called the "threshold of ability." Second, that comparatively few students below the middle of the tables do satisfactory work in college.

On the first point it is possible by simple methods to make further predictions on the basis of the data here used. For example in 1925-26 a prediction was made naming 71 students above the "threshold" who probably would not attain the average of C. Of these 71 only 10 did secure the C average. This prediction was more accurate than that made at Stanford on the basis of the Thorndike tests.

On the second point it may be noted that if all students in these tables up to and including 40 percentile for women and 55 percentile for men are taken, they number 409 out of the total of 1,088, or nearly 40 per cent. Of these, 39, or a little less than 10 per cent, attained an average of C. None attained an average higher than C.

PREDICTION OF HIGH SCHOLARSHIP

It is at once evident from Tables VIII and IX that a strong majority of those with ratings above 75 percentile do satisfactory work.

It is much more difficult to predict which individuals will do work of an average of B grade. Studies of this sort have been made for several years and are being continued. Here the various data regarding the interests, activities, and social relations of the students are helpful. In 1925-26 a list was drawn up in which the object was to include all those who would secure an average of B. Of the whole group 39 made this record; and of these, 36 were included in the list in advance.

It is believed that work along these lines giving basis for advice and encouragement to the most gifted students will be of great value.

RESULTS FOR 1926-27

As this report is going through the press the scholarship records for freshmen in 1926-27 have become available and the results of prediction for this year are inserted in the proof (Tables XIV and XV). In addition to schools enumerated on page 5, other public and private schools in this and other states have furnished the school rank of their students. In these tables are included 155 men and 68 women from the public high schools in this state outside the Twin Cities, 13 men and 31 women from private schools in this state, and 23 men and 21 women from schools in other states. The distribution of Twin City and non-Twin City students in correlation tables is closely alike. It will be seen that the prediction is nearly as accurate as in previous years (compare Tables VIII and IX). The total number of students included in the study this year was 805, or nearly half of the freshman class. (Owing to cancellations only 783 appear in the tables.) This leaves no doubt that the methods of prediction could properly be applied to the whole freshman class whenever the data regarding the student's rank in his high school class can be secured from all high schools.

COMMENTS AND SUGGESTIONS

The questions raised on the one hand by the facts stated here regarding the ability of students and the types of students who come to us from high schools and on the other hand by the financial situation of the University and the demands for further education for the people, are questions of educational

opportunity, of educational guidance, and of the organization of the facilities and resources devoted by the state to educational purposes. No proposals will bear examination or meet the approval of the public which do not look toward the improvement of opportunities for the right kind of training for each individual and the best available advice and direction in his course of training. Proposals dictated by the supposed interests of any institution from the point of view of its traditions or the desires of its staff are unworthy of consideration in the field of publicly supported education. The solution of our educational problems will be found in the organization of resources together with information and advice to help each one to choose wisely the training best suited to his needs. The University as now organized does not offer that variety of opportunity which is required by the range of abilities and interests presented by our students.

It is well known that a large part of the students in the University do not meet the requirements of any course leading to a degree in the college or of any professional school. Approximately 40 per cent of the entrants in the college are lacking in some essential qualities which make up aptitude for this kind of work. About half of these can be identified in advance with a negligible number of errors.

It is also clear that a large number of those who do unsatisfactory work are capable of deriving more or less benefit from pursuing some courses of study in college. These are the students who have averages of D minus or D plus in their work. It is clear that the interests of this group would be better served by instruction of a different character from that which is required for a degree. The college now gives students the privilege of choosing such lines of work but it finds difficulty in introducing new work for this purpose because of the additional expense involved.

The future organization of the state's resources for education should provide: (a) differentiation and expansion of the work of the high school, especially vocational guidance and vocational training; (b) further opportunities for one or two years of work beyond the high school in studies which do not lead to college degrees or professional training. These new opportunities should be provided without sacrificing the higher cultural and professional education already being offered.

A better adjustment between student aptitudes and capacities on the one hand and the kinds of training offered in higher institutions on the other will come through a better understanding of all the significant facts. It will be useful for the University to continue the investigation of student aptitudes and to make its information available to the public. It will be a service appreciated by prospective students and their parents to point out to them that in general success in college work is proportional to the standing of the student in the college aptitude ratings, that those with high ratings should be encouraged to come to college, and that those with very low ratings are almost certain to fail.

When students with low aptitude ratings come to the University we should give them special attention and make every reasonable effort to find the kind of university work, if any, for which they are fitted. It is a keen disappointment to a student to fail to reach his goal after a considerable investment of time, money, and effort. It should be our duty to find out as early as consistent with reliable judgment whether a given student can do university work. If a student is dropped for low scholarship after the University has done all it can for him,

it is not to his advantage to re-enter and try again, because native lack of aptitude for higher studies is not replaced by more preparatory study, by maturity of years, or by experience in other things.

The University is now doing some vocational or trade school work on the secondary level, as in the School of Agriculture, and is giving some vocational instruction on the junior college level. It would be of great value to carry on a thoro study of the possibilities of vocational instruction for high school graduates as a basis for the future organization of this work. Such a study would probably involve an experimental program of vocational teaching and because of the importance of this problem throughout the country, the support of some educational foundation might well be sought for it.

With regard to students coming from other states the University should admit only those who show aptitude for college work and should admit none to advanced standing whose previous record is not satisfactory. When non-resident students are dropped for low scholarship they should have no claim to re-enter the University.

The University Senate has recently provided for the admission of students on the basis of tests in English and psychological tests. This will open the University to any student of mature years who shows aptitude for college work but has not had the advantage of training in high school.

The College of Science, Literature, and the Arts could proceed along the lines suggested above without the creation of any new machinery or new regulations and without disturbing the cordial relations with the high schools which have co-operated in the most friendly spirit in the prosecution of these studies.

TABLE II
CORRELATION OF HIGH SCHOOL RANK WITH FRESHMAN SCHOLARSHIP
1921

H. S. Record										
Percentile Rank	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	I	I	..	2	10	4	2	20
91- 95	..	..	I	3	6	7	5	..	..	22
86- 90	..	..	I	3	6	8	5	..	..	23
81- 85	I	..	..	4	10	2	2	I	..	20
76- 80	3	..	..	6	10	4	3	..	..	26
71- 75	..	..	3	7	9	I	I	..	..	21
66- 70	2	..	I	9	8	2	2	..	..	24
61- 65	2	..	2	6	9	..	I	..	..	20
56- 60	3	..	7	4	8	I	..	I	..	24
51- 55	I	..	5	3	5	I	..	..	..	15
46- 50	3	..	10	7	6	I	27
41- 45	3	2	2	4	5	2	18
36- 40	6	..	11	3	7	I	28
31- 35	3	3	6	8	2	I	23
26- 30	2	2	9	4	I	I	19
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21- 25	7	2	7	5	2	I	24
16- 20	9	I	5	4	2	21
11- 15	6	2	4	5	2	..	I	20
6- 10	11	2	5	2	I	21
1- 5	7	2	6	4	19
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Total	69	16	86	92	99	35	30	6	2	435

Correlation: .63±.02.

$$\frac{167}{96} \bigg| \frac{163}{9}$$

TABLE III
CORRELATION OF HIGH SCHOOL RANK WITH FRESHMAN SCHOLARSHIP,
1923, 1924, AND 1925
MEN

H. S. Record										
Percentile Rank	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	2	..	6	7	12	2	..	29
91- 95	I	..	2	I	5	6	6	3	..	24
86- 90	..	..	4	5	9	5	5	..	..	28
81- 85	I	I	3	9	11	6	2	..	..	33
76- 80	..	I	7	11	9	3	I	..	..	32
71- 75	I	2	3	8	9	4	I	..	..	28
66- 70	..	4	6	9	8	2	..	..	..	29
61- 65	I	I	6	12	11	I	..	..	..	32
56- 60	3	I	11	8	4	I	..	..	..	28
51- 55	..	2	7	11	9	..	..	..	..	29
46- 50	..	2	9	11	I	I	..	..	..	24
41- 45	3	5	8	6	3	I	..	..	..	26
36- 40	2	5	10	6	I	..	..	..	..	24
31- 35	I	5	9	4	2	I	..	..	..	22
26- 30	4	11	11	11	I	I	39
21- 25	6	4	8	4	22
16- 20	4	8	5	4	2	23
11- 15	14	3	8	2	27
6- 10	5	5	7	3	20
1- 5	11	8	8	27
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Total	57	68	134	125	91	39	27	5	0	546

TABLE IV
CORRELATION OF HIGH SCHOOL RANK WITH FRESHMAN SCHOLARSHIP,
1923, 1924, AND 1925
WOMEN

H. S. Record										
Percentile Rank	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	2	1	8	19	25	12	1	68
91- 95	..	..	4	6	15	12	10	1	..	48
86- 90	..	..	2	8	18	14	5	1	..	48
81- 85	1	..	4	4	16	7	2	..	..	34
76- 80	1	1	6	10	6	8	1	..	..	33
71- 75	1	2	3	10	9	5	1	..	..	31
66- 70	1	2	7	8	11	4	..	..	..	33
61- 65	..	3	2	11	6	1	..	..	..	23
56- 60	2	2	6	7	12	2	1	..	..	32
51- 55	3	1	7	9	4	1	..	..	..	25
46- 50	..	3	7	11	4	..	..	..	..	25
41- 45	1	2	7	5	3	..	..	..	..	18
36- 40	1	1	7	5	2	1	..	..	..	17
31- 35	2	2	5	9	3	..	..	..	..	21
26- 30	2	1	10	5	2	..	..	..	..	20
21- 25	2	1	3	4	..	..	..	..	..	10
16- 20	2	2	3	4	..	..	..	..	..	11
11- 15	4	4	3	2	2	..	..	..	..	15
6- 10	5	1	7	3	..	..	..	..	..	16
1- 5	1	2	1	4	..	..	..	..	..	8
Total	30	30	95	125	121	75	45	14	1	536

TABLE V
CORRELATION OF PSYCHOLOGICAL TEST RANK WITH FRESHMAN
SCHOLARSHIP
1921

Psychological Test										
Percentile Rank	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	1	1	1	2	2	1	8
91- 95	..	..	1	..	5	..	3	..	..	9
86- 90	1	..	..	3	2	..	6	2	1	15
81- 85	..	1	2	3	3	2	3	..	..	14
76- 80	..	1	2	3	3	7	3	..	..	19
71- 75	1	..	1	4	6	1	..	..	..	13
66- 70	5	..	2	7	13	4	6	..	..	37
61- 65	2	..	6	5	9	6	2	1	..	31
56- 60	2	..	4	5	13	1	1	1	..	27
51- 55	4	1	7	9	9	1	2	..	..	33
46- 50	7	1	13	12	10	2	2	..	..	47
41- 45	6	1	10	6	10	1	..	..	..	34
36- 40	5	2	6	10	3	4	..	..	..	30
31- 35	5	1	6	7	2	2	..	..	..	23
26- 30	2	1	3	6	3	1	..	..	..	16
21- 25	8	1	7	3	..	..	..	..	..	19
16- 20	6	1	3	1	2	1	..	..	..	14
11- 15	5	2	5	3	3	1	..	..	..	19
6- 10	5	2	4	3	1	..	..	..	..	15
1- 5	5	1	4	1	1	..	..	..	..	12
Total	69	16	86	72	99	35	30	6	2	435

Correlation: .50±.02.

192	162
72	9

TABLE VI
CORRELATION OF PSYCHOLOGICAL TEST RANK WITH FRESHMAN
SCHOLARSHIP, 1923, 1924, AND 1925
MEN

Psychological Test Percentile Rank	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	5	9	10	12	9	3	..	48
91- 95	..	2	3	8	11	8	3	..	..	35
86- 90	1	3	2	5	7	2	3	2	..	25
81- 85	2	2	10	3	7	4	..	1	..	29
76- 80	2	1	6	13	10	1	3	..	..	36
71- 75	1	2	7	5	4	1	2	..	..	22
66- 70	2	2	4	5	4	1	..	..	..	18
61- 65	1	3	7	8	3	1	..	1	..	24
56- 60	3	4	8	10	8	2	1	..	..	36
51- 55	2	2	8	2	5	1	1	..	..	21
46- 50	6	2	9	11	2	2	..	..	..	32
41- 45	3	4	5	5	1	..	1	..	..	19
36- 40	1	6	5	6	5	..	1	..	..	24
31- 35	7	4	11	7	3	2	1	..	..	35
26- 30	2	6	7	3	1	1	1	..	..	21
21- 25	6	6	12	9	3	..	..	..	..	36
16- 20	1	2	5	9	2	..	..	..	..	19
11- 15	6	8	4	1	4	..	..	..	..	23
6- 10	6	4	11	4	..	..	..	..	..	25
1- 5	5	4	5	2	1	..	..	..	..	17
Total	57	67	134	125	91	38	26	7	0	545

TABLE VII
CORRELATION OF PSYCHOLOGICAL TEST RANK WITH FRESHMAN
SCHOLARSHIP, 1923, 1924, AND 1925
WOMEN

Psychological Test Percentile Rank	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	2	3	5	6	2	..	18
91- 95	..	1	3	4	9	10	11	4	1	43
86- 90	..	..	1	4	5	6	6	2	..	24
81- 85	1	..	2	4	9	4	2	1	..	23
76- 80	..	2	3	3	9	10	7	1	..	35
71- 75	1	1	..	4	6	5	1	..	..	18
66- 70	2	1	2	5	4	3	4	..	..	21
61- 65	1	3	4	11	3	6	2	1	..	31
56- 60	..	4	6	10	8	3	3	..	..	34
51- 55	..	1	4	2	11	5	..	..	..	23
46- 50	1	2	4	7	12	1	..	..	..	27
41- 45	1	..	9	7	6	..	2	..	..	25
36- 40	2	2	9	7	6	5	1	..	..	32
31- 35	..	2	6	7	4	2	..	..	..	21
26- 30	..	1	4	7	9	2	..	1	..	24
21- 25	..	4	6	9	5	1	..	..	..	25
16- 20	3	..	3	6	3	2	..	..	..	17
11- 15	4	1	8	9	..	3	..	..	..	25
6- 10	4	2	5	6	7	..	..	..	..	24
1- 5	10	3	16	10	3	..	..	..	..	42
Total	30	30	95	125	121	73	45	12	1	532

TABLE VIII
CORRELATION OF COMBINED HIGH SCHOOL AND TEST RATINGS WITH
FRESHMAN SCHOLARSHIP, 1923, 1924, AND 1925
MEN

Combined Ratings	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	..	..	6	9	2	..	17
91- 95	..	..	2	1	6	8	4	2	..	23
86- 90	..	..	5	4	10	8	5	1	..	33
81- 85	..	..	4	10	12	5	3	..	..	34
76- 80	..	..	4	8	8	1	1	..	..	22
71- 75	2	..	1	5	12	1	2	..	..	23
66- 70	..	1	4	15	6	4	1	1	..	32
61- 65	1	..	8	12	6	3	2	..	..	32
56- 60	4	3	6	11	8	3	..	..	..	35
51- 55	3	8	10	13	4	..	..	..	..	38
46- 50	5	3	12	12	4	2	..	..	..	38
41- 45	4	3	14	8	6	..	..	..	..	35
36- 40	9	7	11	10	5	..	..	..	..	42
<hr/>										
31- 35	8	5	10	8	1	..	..	..	..	32
26- 30	10	6	12	7	..	..	..	..	..	35
21- 25	12	2	10	2	1	..	..	..	..	27
16- 20	9	4	8	1	1	..	..	..	..	23
11- 15	9	2	1	2	..	..	..	..	..	14
6- 10	6	2	2	..	..	..	..	..	..	10
1- 5	4	1	..	..	..	..	..	..	..	5
<hr/>										
Total	86	47	124	129	90	39	27	6	0	550

243 | 161

143 | 3

TABLE IX
CORRELATION OF COMBINED HIGH SCHOOL AND TEST RATINGS WITH
FRESHMAN SCHOLARSHIP, 1923, 1924, AND 1925
WOMEN

Combined Ratings	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	..	2	4	9	3	1	19
91- 95	..	..	..	1	8	9	11	7	..	36
86- 90	..	..	..	2	8	12	6	1	..	29
81- 85	..	..	..	1	8	8	8	1	..	26
76- 80	1	..	6	5	17	9	5	1	..	44
71- 75	..	2	1	4	10	6	4	..	..	27
66- 70	2	2	1	8	14	5	1	..	..	33
61- 65	2	..	6	15	12	5	..	..	..	40
56- 60	2	3	6	10	13	2	..	..	..	36
51- 55	1	..	13	12	9	4	..	..	..	39
46- 50	..	1	2	14	6	4	..	..	..	27
41- 45	3	2	7	13	6	2	1	..	..	34
36- 40	2	5	9	13	6	..	..	..	..	35
31- 35	7	4	7	9	8	..	..	..	..	35
26- 30	2	1	9	4	1	..	..	..	..	17
<hr/>										
21- 25	5	..	9	4	..	..	..	..	..	18
16- 20	2	2	9	5	..	..	..	..	..	18
11- 15	5	..	3	3	..	..	..	..	..	11
6- 10	7	1	1	1	..	..	..	..	..	10
1- 5	1	..	2	2	..	..	..	..	..	5
<hr/>										
Total	42	23	91	126	128	70	45	13	1	539

220 | 257

62 | 0

TABLE X
CORRELATION OF COMBINED HIGH SCHOOL AND TEST RATINGS WITH
SCHOLARSHIP FOR FOUR YEARS
(Group entered 1921)
MEN

Combined Ratings									
	F-	F+	D-	D+	C-	C+	B-	B+	A
96 - 100							•	•	
91 - 95						•	•	••	
86 - 90				⊙	⊙ •	○	•		
81 - 85					⊙ •	○ ○ •	○ ○		
76 - 80				†	○	⊙ •	○	•	
71 - 75					○ • •		⊙ • •		
66 - 70	⊙	⊙	⊙ ○	○ ○	⊙ ○ •		• • •		
61 - 65	⊙ ○		○	⊙ ○ ○	○ • •	•			
56 - 60	⊙	⊙	⊙ ⊙	⊙ ⊙ ○	• • •				
51 - 55			○	○ ○ ○	⊙ ○ •	•	•		
46 - 50	⊙	⊙ ⊙	⊙ ○	○ ○ ○	⊙ ○		•		
41 - 45		⊙ ⊙ ⊙	⊙ ○ ○	⊙ ○ ○	○ • •				
36 - 40	⊙		⊙	⊙ ○ ○	○ •		•		
31 - 35	⊙ ○	⊙ ⊙	⊙ ○	⊙ ⊙ ○ ○	○				
26 - 30	⊙ ⊙	⊙	⊙ ⊙ ○ ○	○ ○ ○	○				
21 - 25	⊙ ○	⊙ ⊙	⊙ ○	○ ○	○ ○				
16 - 20	⊙ ⊙	⊙ ⊙	⊙ ○	⊙ ○ ○	○ ○				
11 - 15	⊙ ⊙	⊙ ⊙	⊙ ○	○					
6 - 10	⊙ ○	⊙		○					
1 - 5									

- ⊙ Six quarters residence or less
- Six to twelve quarters residence
- Four years progress or graduated
- † Deceased

TABLE XI
CORRELATION OF COMBINED HIGH SCHOOL AND TEST RATINGS WITH
SCHOLARSHIP FOR FOUR YEARS
(Group entered 1921)
WOMEN

Combined Ratings									
	F-	F+	D-	D+	C-	C+	B-	B+	A
96-100							•	••	
91-95						••	•		
86-90				••		•••	•		
81-85					••	•••	••		
76-80			•	•	•••	•••	•••		
71-75			•	••	•••	•••	•		
66-70		†	•	••	•••	••	•		
61-65			••	••	•••	•	•		
56-60			••	•••	•••	••			
51-55		••	••	•••	•••				
46-50		••	•••	•••	•••				
41-45	•		•••	•••	••				
36-40	•	•	•••	•••	••				
31-35	•	•	••	••	••	•			
26-30	•	••	•••	•••	•				
21-25		•••	•	•••					
16-20	•	•	•••	•					
11-15	••		•						
6-10	•								
1-5			•	•					

• Six quarters residence or less
 ◦ Six to twelve quarters residence
 • Four years progress or graduated
 † Deceased

TABLE XII
CORRELATION OF COMBINED HIGH SCHOOL AND TEST RATINGS WITH
FRESHMAN SCHOLARSHIP, 1922
MEN

Combined Ratings	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	..	..	3	2	1	..	6
91- 95	..	..	..	1	2	..	2	1	..	6
86- 90	..	..	..	..	1	2	1	..	..	4
81- 85	..	..	2	1	..	1	..	..	..	4
76- 80	..	..	..	3	4	..	1	..	..	8
71- 75	..	..	1	1	2	..	1	..	..	5
66- 70	..	..	1	1	2	2	..	..	..	6
61- 65	..	1	..	1	3	..	..	..	..	5
60	..	1	1	..	1	..	..	..	..	3
<hr/>										
56- 59	..	1	3	..	..	..	..	..	..	4
51- 55	3	1	3	3	..	..	..	..	..	10
46- 50	3	1	3	7	..	..	..	..	..	14
41- 45	..	4	5	1	..	..	..	..	..	10
36- 40	3	1	3	5	..	..	..	..	..	12
31- 35	4	2	2	2	..	..	..	..	..	10
26- 30	..	3	1	..	..	1	..	..	..	5
21- 25	..	5	3	3	..	..	..	..	..	11
16- 20	3	1	2	..	..	..	..	..	..	6
11- 15	..	3	..	..	..	..	..	..	..	3
6- 10	..	1	2	..	..	..	..	..	..	3
1- 5	..	..	1	..	..	..	..	..	..	1
<hr/>										
Total	16	25	33	29	15	9	7	2	0	136

Correlation: $.70 \pm .03$.

$$\frac{15}{88} \bigg| \frac{32}{1}$$

TABLE XIII
CORRELATION OF COMBINED HIGH SCHOOL AND TEST RATINGS WITH
FRESHMAN SCHOLARSHIP, 1922
WOMEN

Combined Ratings	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	..	1	3	..	..	..	4
91- 95	..	..	..	..	3	1	1	..	..	5
86- 90	..	..	..	1	4	4	4	..	..	13
81- 85	..	..	1	2	2	2	1	..	..	8
76- 80	1	..	..	2	6	2	..	..	..	11
71- 75	..	..	1	2	7	1	..	..	..	11
66- 70	..	..	..	3	2	1	..	..	..	6
61- 65	1	..	5	6	2	..	..	..	..	14
56- 60	1	..	..	4	4	..	..	..	..	9
51- 55	..	..	3	5	1	..	..	..	..	9
46- 50	..	..	6	2	2	..	..	..	..	10
43- 45	..	1	2	2	1	..	..	..	..	6
<hr/>										
41- 42	1	..	2	1	..	..	..	..	..	4
36- 40	1	1	3	2	..	..	..	..	..	7
31- 35	..	1	4	2	..	..	..	..	..	7
26- 30	2	2	2	2	..	..	..	..	..	8
21- 25	2	..	1	1	1	..	..	..	..	5
16- 20	..	..	..	3	..	..	..	..	..	3
11- 15	1	..	2	..	..	..	..	..	..	3
6- 10	..	..	..	..	..	..	..	..	..	..
1- 5	..	..	1	..	..	..	..	..	..	1
<hr/>										
Total	10	5	33	40	36	14	6	0	0	144

Correlation: $.67 \pm .03$.

$$\frac{51}{37} \bigg| \frac{55}{1}$$

TABLE XIV
STUDENTS ENTERING FROM SCHOOLS OF ALL KINDS, 1926-27
MEN

Combined Ratings	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	1	2	2	5	3	1	14
91- 95	..	..	..	2	3	10	4	1	..	20
86- 90	..	..	4	4	6	5	8	..	..	27
81- 85	..	..	3	6	7	4	1	..	..	21
76- 80	..	2	4	5	7	8	4	..	..	30
71- 75	..	1	3	12	10	4	1	..	..	30
66- 70	1	1	6	9	6	2	1	..	..	26
61- 65	1	..	3	5	7	3	..	..	..	19
56- 60	3	2	5	5	5	5	..	..	..	25
51- 55	4	2	4	5	8	1	..	..	..	24
46- 50	5	2	5	21	3	1	1	..	..	38
41- 45	2	3	11	10	..	..	..	..	..	26
36- 40	6	3	9	9	2	1	..	..	..	30
31- 35	8	1	9	5	1	..	..	..	..	24
26- 30	..	2	6	2	2	1	..	..	..	13
21- 25	6	2	8	2	..	..	..	..	..	18
16- 20	9	4	7	5	..	..	..	..	..	25
11- 15	4	6	5	..	..	..	..	..	..	15
6- 10	5	1	2	1	..	..	..	..	..	9
1- 5	..	..	..	..	..	..	..	..	..	..
Total	54	31	94	109	69	47	25	4	1	434

TABLE XV
STUDENTS ENTERING FROM SCHOOLS OF ALL KINDS, 1926-27
WOMEN

Combined Ratings	F-	F+	D-	D+	C-	C+	B-	B+	A	Total
96-100	..	..	..	1	6	2	9	3	3	24
91- 95	..	..	1	2	3	11	3	2	1	23
86- 90	..	1	2	5	10	13	7	4	..	42
81- 85	..	..	1	8	16	2	4	..	..	31
76- 80	..	..	1	5	8	10	..	1	..	25
71- 75	..	..	2	10	7	4	..	..	..	23
66- 70	1	..	2	6	5	4	3	..	..	21
61- 65	1	1	4	9	9	2	1	..	..	27
56- 60	1	1	2	5	10	1	..	..	..	20
51- 55	1	1	8	7	7	1	..	..	..	25
46- 50	1	..	3	3	3	2	1	..	..	13
41- 45	1	2	5	8	2	..	..	..	..	18
36- 40	1	2	4	3	4	..	..	..	..	14
31- 35	1	2	2	4	1	1	..	..	..	11
26- 30	1	1	5	4	1	..	..	..	..	12
21- 25	1	..	1	..	..	..	..	..	..	2
16- 20	3	1	3	1	..	..	..	..	..	8
11- 15	2	1	..	1	..	..	..	..	..	4
6- 10	2	1	..	..	..	..	..	..	..	3
1- 5	1	2	..	..	..	..	..	..	..	3
Total	18	16	46	82	92	53	28	10	4	349