

1941

A survey of the records of master graduates of Massachusetts State College for the years 1935 through 1940.

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ANNALS OF THE AMERICAN MATHS. SOCIETY
OF MASSACHUSETTS STATE COLLEGE for the YEARS
1935 THROUGH 1940

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A SURVEY OF THE RECORDS OF MASTER GRADUATES OF MASS-
ACHUSETTS STATE COLLEGE FOR THE YEARS
1935 THROUGH 1940

BY
IRVIN D. READE, JR.

PROBLEM SUBMITTED FOR DEGREE OF MASTER OF SCIENCE
MASSACHUSETTS STATE COLLEGE, AMHERST

1941

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INTRODUCTION

CHAPTER I

INTRODUCTION

In recent years there has been a vast increase in the number of students attending school. This increase has been felt on all levels of education, including that of higher education.

The increased number of people desiring education has increased the problem of selecting students. There are two distinct aspects of the problem of selecting students:

1. selective admission
2. selective retention.

(1) The Problem of Selective Admission -- Selective admission is concerned with the qualifications of a student at the time he applies for matriculation. In many institutions, such as the case of the freshman class here at Massachusetts State College, the number of applicants for admission exceeds the number which the existing administrative policy indicates should be admitted. The officers of admission must decide from papers presented by each applicant whether or not he will be a satisfactory student. Moreover, the question of admission must be decided before the prospective student has done any work at the particular institution. Obviously, the problem is a very complicated one and one should not be surprised at the large number of maladjustments that are found on the completion of one semester's work.

(2) The Problem of Selective Retention -- The second part of the problem of selection is connected with the retention of

students after they have enrolled and completed some academic work. The procedure here is to find out as soon as possible the students who are likely to fail and the students who are likely to be successful. The handling of the groups thus separated is a matter for the administration to settle according to its policy.

(3) The Scope of the Study -- The study to be reported in the following pages will stress admission and will consider retention only as it has a direct bearing on admission. This study of graduate admission at Massachusetts State College is not concerned with the problem of the desirable size of the graduate enrollment. The data presented in this study does not imply that the number in the graduate school should be either increased or decreased. The determination of the number of students that an institution can accommodate is a matter of administrative policy.

(4) Determining the Admission Policy -- What should the admission policy be? There are as many answers to that question as there are institutions of learning in this country. According to Valentine¹ an admission policy should be based on two factors. The first of which is the educational policy of the school in question. The policy in turn is a compromise between the ideals of its faculty and the practical considerations such as its size and type. The second factor on which an admission policy should be based in a given graduate school is those very definitely practical considerations of the size of class, the amount of scholarship funds available, the cost of tuition and so on.

¹
Valentine, Alan "Policies of Admission" in School and Society XLVI(Dec. 25, 1937) pp. 809-813.

(5) Summary -- As I have said before, the problem of deciding whether or not to make any changes and of determining the nature of any changes desired is left to the appropriate administrative authorities. This study is chiefly concerned with disclosing facts that will show either a justification for the present system of admissions to the Massachusetts State College Graduate School or a need for the revision of the admissions system.

RELATED LITERATURE

CHAPTER II.

RELATED LITERATURE

Although this study is strictly local in character, it is not an entirely new idea. Numerous articles have been written advocating liberal admission requirements for colleges and universities. Also, the University of Chicago made a survey² of admission and retention of students, which, although on a much larger scale than this study, is basically of the same nature.

(1) Articles³ -- Engelhardt, the President of the University of New Hampshire in 1937, said that "one of the most perplexing problems that faces a state university is that which relates to policies affecting admission." He continues with the statement that "the instruments formed to measure the quality of 'college risk' possessed by those who apply for admission do have their value when used in relationship to an arbitrarily conceived program of college study but may have little value when the aims of higher education are defined in terms of individual student needs, and in terms of intellectual achievement and general growth rather than in terms of specified subject matter, time, and credit." And in conclusion he says that "as long as it is necessary to use unproved methods of selection, it is better to be liberal and give youth the benefit of all doubt."

2

Russell, John D. and Reeves, Floyd W. Admission and Retention of Students. Chicago: University of Chicago Press. 1933.

3

Engelhardt, Fred "Flexibility in Admission Requirements", School Review XLV (Dec. 1937) p. 729.

4

Valentine states that there can be no hard and fast general rule as to what the admission policy should be for graduate schools, or any schools in fact. He believes that each school must locally settle this problem according to local conditions and limitations.

(2) Studies -- In 1933 Reeves and Russell made a survey⁵ of admission and retention of students at the University of Chicago. This is one study in a survey covering some forty or fifty projects, which are grouped for purposes of publication into a series of twelve volumes.

The purpose of Part III of Volume V was to "survey the results achieved by the present method of admitting graduate students. Such factors as retention, scholarship, and success in earning degrees are studied in an endeavor to evaluate the present requirements for admission and to determine whether or not other criteria for admission and retention of graduate students might improve the product of the graduate schools."⁶

Part III included chapters on (1) the general characteristics of the graduate-student population, (2) the relationship between graduate scholarship and certain measureable factors, (3) some aspects of the residence history of graduate students, and (4) the prognosis of graduate scholarship.

In an attempt to discover the items of importance for a plan of selective admission, a comparison was made between a group

4
Valentine, Op. Cit. p. 811

5
Reeves and Russell, Op. Cit.

6
Ibid, p. 136

of one hundred of the best graduate students and another group of one hundred of the poorest graduate students in education. The criteria of selection were general academic record, degree of success in preparing a master's thesis, and success in passing a master's examination.

The two most significant items of difference in this comparison of the one hundred best and one hundred poorest graduate students in education are the average number of grade points per major earned during the first quarter of residence and the percentile rank on the psychological examination.⁷ Since the relationship between the average number of grade points per major during the first quarter and during the entire graduate period shows such high agreement, it is apparent that some combination of average grade points per unit during the first quarter and percentile rank on the psychological examination might constitute a valuable criterion for selective retention.⁸

(3) Summary of Literature -- The literature relating to the policies of admission to graduate schools may be summarized as follows:

1. It is believed that a liberal admission policy will enable an institution to best serve the student, the aims of higher education and the country as a whole.⁹

⁷
Ibid, Table 85, p. 233

⁸
Ibid, Table 86, p. 234

⁹
Engelhardt, Op. Cit. p. 729

2. It is believed that there can not be a general rule regarding admission policies but that each local school must determine its policy on the basis of local conditions.¹⁰

3. It was found that the students who entered the University after a lapse of five or more years subsequent to taking the bachelor's degree did better work than those who entered after a shorter lapse of time.¹¹

4. It was found that there is not a high positive correlation between retention and the quality of scholarship. Students with high records were not retained as well as those with only average records, and students with low scholarship records were retained in almost as large a proportion as those with high records.¹²

5. The first quarter of the graduate record is a practical index for predicting the total record.¹³

6. The undergraduate record is of little practical value in predicting prospective graduate work in advance of admission.¹⁴

7. A study made of the amount of time elapsing between the first quarter of graduate work and the final examination in the School of Education revealed that the amount of time consumed had

¹⁰
Valentine, Op. Cit. p. 812

¹¹
Reeves and Russell, Op. Cit. Fig. 12, p. 155

¹²
Ibid, Fig. 18, p. 165

¹³
Ibid, p. 171-172, 176

¹⁴
Ibid, p. 174-175

no relation to the quality of work performed.¹⁵ The study did show that there was a wide range in the length of time between admission and graduation for the students of the Department of Education at the University of Chicago.¹⁶

8. A study¹⁷ of the general achievement of prospective teachers at Massachusetts State College revealed that:

a. if the arbitrary standards set up are correct, many prospective teachers in this college do not have a sufficient grasp of subject matter to teach science, social studies, English, or mathematics.

b. if the arbitrary standards set up are correct, many prospective teachers in this college do not have sufficient general education to be permitted to teach.

c. the prospective teachers in this college compare favorably in intelligence with other students of other colleges.

d. the prospective teachers in this college compare favorably in college marks with other students in this college.

¹⁵ Reeves and Russell, Op. Cit. p. 179-80

¹⁶ Ibid, p. 190

¹⁷ Bracy, Alfred A. "A Study of the General Achievement of Prospective Teachers at Massachusetts State College" from a Master's Thesis submitted for Degree of Master of Science at Massachusetts State College. 1939

STATEMENT OF PROBLEM AND SUMMARY OF PROCEDURE

CHAPTER III.

STATEMENT OF PROBLEM AND SUMMARY OF PROCEDURE

This survey of the records of the Master Graduates of Master Graduates of Massachusetts State College for the years 1935 through 1940 is being made in an attempt to determine if there is any answer to the four questions set forth in the outline.

(1) The Problem -- Specifically, the problem of this study is: 1. What justification is there for the present system of admission to the Massachusetts State College Graduate School?

2. What is the difference between the marks received at Massachusetts State College Graduate School by students who did a "part of their graduate work" at some other school and the marks received by students who did all of their graduate study at Massachusetts State College Graduate School?

3. What per cent of the Master Graduates from 1935 through 1940 majored in any one department?

4. What is the difference, if any, in the marks received by the Master Graduates who complete their graduate study in a short time (1-3 yr.) as compared with those that take a long time (7-10 yr.) to complete their graduate work?

(2) The Subjects -- The subjects in this study are the 276 Master Graduates of Massachusetts State College Graduate School for the five year period of 1935 through 1940.

(3) The Material -- The material used in this study is the filed records of the 276 Master Graduates as they are recorded in the files at the Graduate Office.

(4) The Procedure -- The data from the files were collected and organized on a set of three tables which had been constructed to contain the material necessary to make this study. A sample of this set of tables is found in Appendix I. Then additional tables were constructed to present the information asked for in the questions of the problem. And on the basis of the information of the tables, the conclusions of the problem were drawn.

ANALYSIS OF DATA

CHAPTER IV

ANALYSIS OF DATA

The evidence in answer to the questions set forth in the outline and in the last chapter (Chapter III) is presented in this chapter in the form of a series of tables. The results for each question will be considered separately.

(1) Question #1 -- This question dealt with the problem of whether or not information could be gained from the Graduate School Records to show a justification for the present system of admission to the Graduate School at Massachusetts State College.

At the present time, the Massachusetts State College Graduate School has a very progressive policy of admission. This policy is made up of two parts:

1. In practice nearly anyone who has his Bachelor's Degree may enroll in the Graduate School at Massachusetts State College.

2. At the end of the first semester's work, the Head of the Department in which the student is majoring is supposed to report to the Director of the Graduate School whether or not the student is qualified to become a candidate for a Master's Degree. The decision of the Head of the Department is based on the quality of the work completed by the student during his first semester at the graduate school at this college. The theory behind this system of admission is that the first semester averages are a good index of what the entire graduate work average of a student will be. A comparison of first semester averages with

complete graduate averages showed the following facts: 1. The coefficient of correlation between the first semester major field averages and the total major field averages is $.84 \pm .01$. 2. The coefficient of correlation between the first semester general averages and the total general averages is $.80 \pm .01$.

It is shown by these figures that there is a high degree of agreement between the marks that a student makes during the first semester and the marks that he makes during his entire graduate study.

(2) Question #2 -- What difference has "part graduate work" completed in some other graduate school made in the averages received at Massachusetts State College Graduate School? The results are given in Table I.

TABLE I.

Analysis of the Averages made by the Two Groups in the Four Divisions

| Scores | 1st M. F. | | 1st Gen. | | Total M. F. | | Total Gen. | |
|--|-----------|------|----------|------|-------------|------|------------|------|
| | P | F | P | F | P | F | P | F |
| 95 | 3 | 8 | 1 | 6 | 1 | 2 | 0 | 1 |
| 90 | 12 | 42 | 9 | 30 | 9 | 40 | 6 | 31 |
| 85 | 17 | 92 | 21 | 88 | 23 | 101 | 26 | 92 |
| 80 | 20 | 41 | 17 | 55 | 23 | 51 | 21 | 67 |
| 75 | 6 | 17 | 8 | 25 | 5 | 17 | 8 | 18 |
| 70 | 3 | 10 | 5 | 8 | 2 | 2 | 2 | 4 |
| 65 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Mean | 85.1 | 85.9 | 83.9 | 85.0 | 85.3 | 86.4 | 84.5 | 85.6 |
| Standard deviation of the mean | 6.6 | 6.1 | 6.7 | 5.6 | 4.9 | 4.5 | 4.7 | 4.6 |
| Standard error of the mean | .83 | .33 | .85 | .38 | .62 | .31 | .59 | .31 |
| Difference between the means | | .8 | 1.1 | | | 1.1 | | 1.1 |
| Standard error of diff. between means | | .89 | .93 | | | .69 | | .67 |
| Critical ratio of diff. between means | | .9 | 1.18 | | | 1.59 | | 1.64 |

P - "part time" graduate work

F - all graduate work at M.S.C.

M. F. - "Major field" graduate work

For the period 1935 through 1940 there were 63 Master Graduates, or 23 per cent of the total graduate enrollment for the five year period, who did a part of their graduate study in some school other than Massachusetts State College Graduate School. The means for the part graduate study group are 85.1 for the first semester major field averages, 85.3 for the total major field averages, 83.9 for the first semester general averages, and 84.5 for the total general averages. The means for the group doing all of their graduate study at this graduate school for each division are respectively 85.9, 86.4, 85.0, and 85.6. The standard deviations for the part graduate study are 6.6 for the first semester major field, 6.7 for the first semester general, 4.9 for the total major field, and 4.7 for the total general averages. The standard deviations for each division of the complete graduate study group are respectively 6.1, 5.6, 4.5, and 4.6. These figures show that the first semester divisions are the most heterogeneous, especially the first semester general average for the part graduate study group. A study of the critical ratios shows that in all cases, the difference between the groups is insignificant. The critical ratios vary from 1.39 to .76. However, in all cases the difference is in favor of the group that took all its graduate work at Massachusetts State College Graduate School.

(3) Question #3 -- What was the departmental placement of these 276 Master Graduates on the basis of major work? That is, what per cent of the Master Graduates majored in any one department? The results of this study are found in Table II.

TABLE II

Showing the Departmental Placement of the Master Graduates, by Majors,
for this Five Year Period

| DEPARTMENT | TOTAL | PER CENT |
|-------------------------------|-------|----------|
| Education | 97 | 35.0 |
| Horticultural Manufactures .. | 38 | 13.8 |
| Chemistry | 24 | 8.7 |
| Entomology | 18 | 6.5 |
| Agricultural Economics | 16 | 5.8 |
| Agronomy | 15 | 5.4 |
| Bacteriology | 12 | 4.8 |
| Dairy | 10 | 4.0 |
| Psychology | 9 | 3.6 |
| Botany | 8 | 3.2 |
| Home Economics | 8 | 3.2 |
| Economics | 6 | 2.4 |
| Poultry | 3 | 1.2 |
| Animal Husbandry | 2 | .8 |
| English | 2 | .8 |
| History | 2 | .8 |
| Pomology | 2 | .8 |
| Floriculture | 1 | .4 |
| Olericulture | 1 | .4 |
| Horticulture | 1 | .4 |
| Wildlife | 1 | .4 |

The number of students majoring in each department ranges from 1 to 97. The departments containing the five largest memberships are respectively Education, Horticultural Manufactures, Chemistry, Entomology, and Agricultural Economics. The major membership of the Department of Education is nearly three times as large as the next largest group.

The departments in which the students who did a part of their graduate work at some other college were majors are listed in Table III.

TABLE III

Departments in which the Students who did a Part of their Graduate Study Elsewhere are Majors

| DEPARTMENT | NUMBER | PER CENT OF TOTAL IN DEPT. |
|------------------------------|--------|----------------------------|
| Education | 50 | 51 |
| Agricultural Economics | 3 | 19 |
| Horticultural Manufactures . | 2 | 5 |
| Psychology | 2 | 22 |
| Entomology | 2 | 11 |
| Bacteriology | 1 | 8 |
| Home Economics | 1 | 12 |
| Dairy | 1 | 10 |
| Agronomy | 1 | 6 |

The number of students majoring in each department under this classification ranges from 1 to 50. The departments containing the five largest memberships are respectively Education, Agricultural Economics, Horticultural Manufactures, Psychology, and Entomology. The total number of students majoring in education under this classification is greater than the sum of all the others.

(4) Question #4 -- Is there any noticeable difference in the quality of the graduate work on the basis of the length of time required in acquiring a Master's Degree? The results of this study are shown in Table IV.

TABLE IV

The Analysis of the Averages made by the Two Groups in the Four Divisions, according to the Length of Graduate Study

| Scores | 1st M. F. | | 1st Gen. | | Total M. F. | | Total Gen. | |
|---------------------------------------|-------------------------------|------|----------|------|--------------------------|------|------------|------|
| | S | L | S | L | S | L | S | L |
| 95 | 6 | 2 | 4 | 1 | 4 | 0 | 2 | 0 |
| 90 | 46 | 4 | 29 | 5 | 39 | 7 | 26 | 4 |
| 85 | 96 | 7 | 97 | 7 | 108 | 8 | 97 | 10 |
| 80 | 49 | 10 | 56 | 9 | 51 | 9 | 13 | 10 |
| 75 | 9 | 5 | 18 | 6 | 6 | 4 | 11 | 4 |
| 70 | 4 | 0 | 4 | 0 | 2 | 0 | 1 | 0 |
| 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 87 | 85.4 | 85.9 | 85 | 87 | 85.7 | 85.9 | 85.0 |
| Standard deviation of the mean | 4.75 | 5.85 | 4.10 | 5.60 | 4.15 | 5.0 | 4.05 | 4.50 |
| Standard error of the mean | .33 | 1.11 | .29 | 1.06 | .28 | .94 | .28 | .30 |
| Difference between the means | | 1.6 | | .9 | | 1.3 | | .9 |
| Standard error of diff. between means | | 1.16 | | 1.09 | | .98 | | .85 |
| Critical ratio of diff. between means | | 1.39 | | .82 | | 1.34 | | .76 |
| | S -- 1 to 3 years | | | | L -- 7 to 10 years | | | |
| | M. F. --- Major Field Average | | | | Gen. --- General Average | | | |

For the five year period under study there were 28 students who took from 7 - 10 years to complete their graduate study, 210 students who took from 1 - 3 years to complete their graduate study, and 38 students who took 4 - 6 years or more than 10 years to complete their graduate study. Therefore, 76 per cent of the 276 Master Graduates completed their graduate study in from 1 - 3 years. The means for the group completing its Master's study in 1 - 3 years are 87 for the 1st semester major field average,

85.9 for the first semester general average, 87 for the total major field average and 85.9 for the total general average. The means for the group completing its master's study in 7 - 10 years for each of the divisions are respectively 85.4, 85, 85.7, and 85. The standard deviations for the group completing its master's study in 1 - 3 years are 4.75 for the first semester major field average, 4.1 for the first semester general average, 4.15 for the total major field average, and 4.05 for the total general average. The standard deviations for the group completing its master's study in 7 - 10 years are for each division respectively 5.85, 5.6, 5, and 4.5. These figures show that the first semester major field average for the group completing its graduate study in 7 - 10 years is the most heterogeneous. The critical ratios show that there is no dependable difference in the averages made by the two groups.

(5) Summary -- By studying Tables I and IV, it is noticed that there is not a reliable difference between any of the groups. Table II shows the number of master graduates that majored in each department. The correlations between first semester averages and total averages were high and showed a high degree of agreement. Conclusions in regard to these facts will be found in Chapter V.

CONCLUSIONS, LIMITATIONS
AND DISCUSSION

CHAPTER V

CONCLUSIONS, LIMITATIONS AND DISCUSSION

The conclusions in this chapter are based up the results shown in Tables I, II, III, IV, plus the correlations between the first semester averages and the total averages. These results were obtained by statistical methods which are explained in the Appendix.

(1) Statement of the Problem -- The problems of this study are: (a) Is there any justification for the present system of admission to the graduate school?

(b) What difference has "part graduate work" done elsewhere made?

(c) What per cent of the master graduates majored in any one department?

(d) What difference has the length of graduate enrollment made? (1 - 3 years) or (7 - 10 years)

(2) Conclusions -- After an analysis of Tables I, II, III, IV, and the correlations between the first semester averages and the total averages it seems that:

1. There is a justification for the present system of admission to the graduate school as there is a high positive correlation between the first semester averages and the total graduate averages.

2. It does not make any significant difference in the averages if a part of the graduate study is carried out at some other graduate school.

3. The Department of Education has the largest per cent of master graduates majoring in its department.

4. The length of graduate enrollment (up to 10 years) does not make any reliable difference.

(3) Limitations -- This study has several limitations:

1. It is distinctly local in character.

2. This study did not consider the grade of undergraduate work. A correlation of the undergraduate record with the graduate record might make some difference in the results.

3. This study deals with average grades. Averages, often do not give a clear picture of the case.

4. This study was limited to a five year period. A longer period of time might have made some difference in the results.

5. This study dealt with only those students who had received their Master's degree. A study of all students that enrolled might make some difference in the results.

6. This study made no attempt to pair the students into two equal groups. This may have given advantage to some one of the groups.

(4) Discussion -- This study did not consider all the pertinent factors; the study collected only those that were available. Some factors that might have influenced the results are: mental age, chronological age, sex, experience, the courses taken, and the department majored in. Previous studies indicate that there is a positive correlation between the first semester work of a

student and the total graduate work of that student. This would tend to indicate that limited as this study was, its results are reliable.

APPENDICES

APPENDICES

- (1) Sample Tables
- (2) The Method of Finding Correlation
- (3) The Critical Ratio Method

APPENDIX I

SAMPLE TABLES

TABLE Ia

Showing undergraduate data of the Master Graduates of Massachusetts State College from 1935 through 1940.

| Student Number | College | Degree | Year Graduated |
|----------------|---------|--------|----------------|
| 1 | M.S.C. | B.S. | 1932 |
| 2 | B. U. | B.S. | 1932 |
| 3 | Tufts | B.S. | 1910 |

TABLE Ib

Showing the graduate data of the Master Graduates of Massachusetts State College from 1935 through 1940.

| Student Number | Date of Enrollment | Previous Grad. Work School--Ave. | Date of Graduation | Grad. Ave. | Major Field | M.F. Ave. |
|----------------|--------------------|----------------------------------|--------------------|------------|-------------|-----------|
| 1 | Sept. 1932 | None | June 1935 | 90.9 | Botany | 93 |
| 2 | July 1938 | U. Chic. 85 | " 1940 | 84.6 | Educ. | 82.7 |
| 3 | June 1931 | N. Adams 84 | " 1940 | 86.3 | Educ. | 85 |

TABLE Ic

Showing comparative data on the first semester and the general averages for the Master Graduates from 1935 to 1940.

| Student Number | 1st Semester M.F. Average | 1st Semester Gen. Average | Total M.F. Average | Graduate Average |
|----------------|---------------------------|---------------------------|--------------------|------------------|
| 1 | 92.5 | 89 | 93 | 90.9 |
| 2 | 83 | 84.3 | 82.7 | 84.6 |
| 3 | 89 | 90.5 | 85 | 86.3 |

APPENDIX II

THE PEARSON PRODUCT MOMENT METHOD OF CORRELATION

The following steps show how to find a correlation according to the Pearson Product Moment Method:

1. Make a scatter diagram and tabulate the variables being correlated.
2. Substitute numbers for the tallies.
3. Total the frequencies by rows and columns.
4. Make computations at the right the same as in computing the standard deviation.
5. Make computations at the bottom the same as in computing the standard deviation.
6. Multiply each cell-frequency by its corresponding x value.
7. Add up the numbers in parentheses by columns.
8. Multiply fx by y .
9. Substitute in the formula. The formula $r = \frac{\sum xy - \frac{(\sum fdx)(\sum fdy)}{N}}{\sqrt{\sum fd^2y - \frac{(\sum fdy)^2}{N}} \cdot \sqrt{\sum fd^2x - \frac{(\sum fdx)^2}{N}}}$
10. Clear up the complex fraction.

Below is an example

| | 1 | 2 | 3 | 4 | 5 | 6 | f | d | fd | fd ² | xy |
|-----------------|----|----|----|---|---|---|-----------|-----------------------|-------------------------|-----------------|----|
| 95 | | | | | 1 | 1 | 2 | 2 | 4 | 8 | 6 |
| 90 | | | | 2 | 1 | 1 | 4 | 1 | 4 | 4 | 3 |
| 85 | | | 1 | 3 | | | 4 | 0 | 0 | 0 | 0 |
| 80 | | | | 3 | | | 3 | -1 | -3 | 3 | 0 |
| 75 | | 1 | 1 | | | | 2 | -2 | -4 | 8 | 6 |
| 70 | | 1 | | | | | 1 | -3 | -3 | 9 | 6 |
| f | 0 | 2 | 2 | 8 | 2 | 2 | 16 | $\frac{\sum fdx}{-2}$ | $\frac{\sum fd^2x}{32}$ | | |
| d | -3 | -2 | -1 | 0 | 1 | 2 | | | | | |
| fd | 0 | -4 | -2 | 0 | 2 | 4 | $\sum xy$ | | | | |
| fd ² | 0 | 8 | 2 | 0 | 2 | 8 | $\sum xy$ | | | | |

$$r = \frac{21 - \frac{-2 \times 0}{16}}{\sqrt{20 - \frac{(-2)^2}{16}} \cdot \sqrt{32 - \frac{(0)^2}{16}}} = .87$$

APPENDIX III.

THE CRITICAL RATIO METHOD

The "critical ratio" of the difference between means is found by dividing the difference by its standard error. The following steps are used:

1. Compute the two means by the short method. The formula is $M = M_1 + \frac{\sum fd}{N}$; where M_1 is the guessed mean and 1 the interval.

2. Compute the two standard deviations. The formula is $\sigma = \sqrt{\frac{\sum fd^2}{N} - \left(\frac{\sum fd}{N}\right)^2}$;

3. Compute the two standard errors of means. The formula is $\sigma_M = \frac{\sigma}{\sqrt{N}}$.

4. Compute the standard error of the difference. The formula is $\sigma_d = \sqrt{\sigma_1^2 + \sigma_2^2}$.

5. Compute the critical ratio of the difference. The formula is $C.R. = \frac{D}{\sigma_d}$. Below is an example

| Scores | f | d | fd | fd ² |
|----------|---|----------------|--------|-------------------|
| 78 | 1 | 7 | 7 | 49 |
| 75 | 0 | 6 | 0 | 0 |
| 72 | 1 | 5 | 5 | 25 |
| 69 | 2 | 4 | 8 | 32 |
| 66 | 0 | 3 | 0 | 0 |
| 63 | 6 | 2 | 12 | 24 |
| 60 | 2 | 1 | 2/34 | 2 |
| 57 | 3 | 0 | | |
| 54 | 7 | -1 | -7 | 7 |
| 51 | 3 | -2 | -6 | 12 |
| 48 | 2 | -3 | -6 | 18 |
| 45 | 1 | -4 | -4 | 16 |
| 42 | 2 | -5 | -10 | 50 |
| 39 | 1 | -6 | -6/-39 | 36 |
| $N = 31$ | | $\sum fd = -5$ | | $\sum fd^2 = 271$ |

$$M = 58.5 + \frac{-5}{31} \times 3 = 58.02$$

$$\sigma = \sqrt{\frac{271}{31} - \left(\frac{-5}{31}\right)^2 \times 3} = 8.7$$

$$\sigma_{M_1} = \frac{8.7}{5.57} = 1.56$$

Suppose for another group we had these figures:

$$M = 47.93$$

$$\sigma = 8.31$$

$$\sigma_{M_2} = 1.81$$

Then

$$\sigma_d = \sqrt{1.56^2 + 1.81^2} = 2.39$$

and

$$C.R. = \frac{11.09}{2.39} = 4.6$$

BIBLIOGRAPHY

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The references are listed alphabetically according to the author's name.

Bracy, Alfred A. "A Study of the General Achievement of Prospective Teachers at Massachusetts State College". Master's Thesis submitted for Degree of Master of Science at Massachusetts State College. 1939.

Engelhardt, Fred "Flexibility in Admission Requirements" School Review XLV (Dec. 1937) p. 729.

Russell, John D. and Reeves, Floyd W. Admission and Retention of Students. Chicago: University of Chicago Press. 1933.

Valentine, Alan "Policies of Admission" in School and Society XLVI (Dec. 25, 1937) pp. 809 - 813.

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