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A Selective Study Relating High School Achievement with College Success at the Iowa State University and the University of Omaha

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A SELECTIVE STUDY RELATING HIGH SCHOOL ACHIEVEMENT WITH COLLEGE SUCCESS AT THE IOWA STATE UNIVERSITY AND THE UNIVERSITY OF OMAHA

A Thesis

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Master Of Arts

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by

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CHAPTER I

THE PROBLEM AND ITS SCOPE

Inherent in the democratic ideal of free public education comes the realization that as the number of youth receiving elementary education increases, the greater the demand for secondary education, and finally, the enlarged desire for additional college training. As increasing numbers of these young people seek entrance into our institutions of higher learning, and as these institutions become more selective in their admission policies, it becomes imperative that trained guidance personnel acquaint themselves more thoroughly with the various predictive devices available to predict college success with some degree of precision. This study was conducted with the hope of interpreting some of the local high school data in order to increase this predictive accuracy, both for the investigator and other counselors confronted with a similar problem.

I. THE PROBLEM

Statement of the Problem

The purpose of this study was to determine the relationship between achievements of high school students at the Abraham Lincoln High School, Council Bluffs, Iowa and success in college at two selected universities. These insti-

tutions were the Iowa State University, Ames, Iowa and the Municipal University of Omaha, Omaha, Nebraska. These schools were chosen because a majority of the Abraham Lincoln High School graduates attending college between 1949 and 1959, the years chosen for the study, attended these two universities.

The Hypothesis for the Problem

A review of previous research involving similar correlations between high school achievement and college success suggested relatively high positive correlation, especially when studied within a single school-university relationship. While less data were available concerning specific course relationships it was assumed that a positive correlation would still be indicated.

Therefore, the hypothesis for this problem was that high school achievement, as measured by selected high school grades of Abraham Lincoln High School graduates from 1949 to 1959, correlated positively with the college success, as measured by selected freshman college grades of these graduates attending the Iowa State University or the University of Omaha.

Importance of the Study

One of the basic functions of the counseling process is the educational counseling of students. It is concerned primarily with assisting young people to decide upon and prepare for their future courses of study. The counselor thus

has a certain obligation to evaluate and utilize the various techniques which could be applied to the prediction of future educational success of his counselees so they may more confidently pursue their educational goals.

As the number of students seeking entrance to college increases, so does the responsibility of the counseling process to meet the needs of these students. As entrance requirements stiffen, and as the cost of higher education rises, the predictive efficiency of the counselor must keep pace with these demands if he is to properly merit the confidence and acceptance of his counselees. The hope of this investigator is to provide reliable data, at the local high school level, which would enable Abraham Lincoln High School counselors to assume these increasing obligations.

II. DEFINITION OF TERMS

Achievements of High School Students

This term was used to indicate selected high school grades of graduates of the Abraham Lincoln High School, Council Bluffs, Iowa. These grades were averaged for three years of high school attendance and included the overall average for all courses: averages in mathematics, which included two semesters of algebra, three semesters of geometry, and one semester of trigonometry; averages in science, which included two semesters of biology, two semesters of physics, and two semesters of chemistry, and averages

in six semesters of English. The grade "4" indicated superior, "3" above average, "2" average, "1" below average, and "0" failure. Only students who had received grades in these courses and subsequently attended either the Iowa State University or the University of Omaha during the period studied were included.

Success in College

As pointed out by Garrett, the criterion of college success in nearly all cases which he evaluated was college marks received for a given period of time, usually the first semester, quarter or year, although a few studies included the entire four years. These marks were nearly always transmuted to grade point averages by assigning a numerical value to each letter grade and dividing their total by the number of college credits received.[1] This procedure was followed in this study with college grade point averages for the freshman year used as the criteria and passing grades used as indicators of success. Grades in three areas, in addition to the overall freshman grade point average, were included. The areas were freshman mathematics, freshman science and

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[1]Harley F. Garrett, "A Review and Interpretation of Factors Related to Scholastic Success in Colleges of Arts and Sciences and Teachers Colleges," Journal of Experimental Education, 18:93, December, 1949.

freshman English. Individual courses are defined in succeeding sections.

Iowa State University Grades

The following system was used by instructors in reporting marks to the Registrar: A, superior; B, very good; C, satisfactory; D, passing but unsatisfactory; E, conditon; F, failure; W, withheld; X, dropped. For each credit earned the student received quality points accoording to the mark attained, as follows: A, four points; B, three points; C, two points; D, one point; E, and F, zero points.[2]

University of Omaha Grades

The grades were determined by the daily record of the student and the record made on quizzes, mid-semester and semester examinations. The weight attached to each of these factors was determined solely by the instructor of the course. The grading system was as follows: For each semester hour of A, four quality points; B, three quality points; C, two quality points; D, one quality point. In addition to the

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[2]General Catalog and Announcements, 1959-1961, Volume LVIII, Number 11 (Ames, Iowa: Iowa State University of Science and Technology, 1959), p. 22.

above, "Condition" and "Incomplete" grades carrying zero quality points were given.[3]

Freshman

The Iowa State University gave no definition for this term except that during this year the student must complete nine credits in written English and at least ten credits in mathematics, in addition to twenty-four to twenty-seven credits in special departments, such as chemistry, history or ecomonics.[4] The University of Omaha defined academic classification as being determined by the number of semester hours of academic credit earned and the quality of work as expressed in quality points. To complete the freshman year the student must have completed twenty-seven semester hours and have earned forty quality points.[5]

Mathematics Grades

This term was used to include the average grade point for the freshman year in those courses designed primarily as

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[3]General Catalog for the Academic Years 1957-58, 1958-59, Volume XIX, Number 1 (Omaha, Nebraska: Bulletin of the University of Omaha, 1957), p. 27.

[4]Iowa State University of Science and Technology, op. cit., p. 110

[5]University of Omaha, loc. cit.

beginning courses in college mathematics. At the Iowa State University these courses included: Mathematics 101, College Algebra; Mathematics 102, Plane Trigonometry; Mathematics 103, Analytical Geometry. At the University of Omaha these courses included: Mathematics 113, College Algebra and Trigonometry; Mathematics 114, College Algebra and Analytical Geometry.

Science Grades

This term was used to include the average grade point for the freshman year in those courses designed primarily as beginning courses in college science. At the Iowa State University these courses included: Chemistry 101, General Chemistry; Chemistry 102, General Chemistry; Chemistry 103, Qualitative Analysis. At the University of Omaha these courses included Chemistry 111 and 112, General Chemistry.

English Grades

This term was used to include the average grade point for the freshman year in those courses designed primarily as beginning courses in college English. At the Iowa State University these courses included: English 101, English 102, and English 103, all titled Principles of Composition. At the University of Omaha these courses included: English 111, Elementary English Composition; English 112, Intermediate English Composition.

Determine the Relationships

The coefficient of correlation between predictors and criteria was the usual means of showing relationships and the predictive value of the predictors was inferred from the size and sign of the coefficient. As defined by Guilford, the coefficient of correlation was one of those summarizing numbers, like a mean or a standard deviation, which though it is a single number, tells a story. It can vary from a value of + 1.00, which means perfect positive correlation, through zero, which means complete independence or no correlation whatsoever, on down to - 1.00, which means perfect negative correlation.[6] Statistical analyses designed to produce coefficients of correlation will be described in the next chapter.

III. DELIMITATIONS

The limitations in the selection of students for this study will be discussed more fully in Chapter II. It should be noted, however, that the study was limited to students graduated from the Abraham Lincoln High School during the years 1949 to 1959 and subsequently attending either the

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[6] J. P. Guilford, Fundamental Statistics in Psychology and Education, (New York: McGraw-Hill Book Company, Inc., 1956) p. 135.

Iowa State University or the University of Omaha. The years 1949 to 1959 were arbitrarily chosen to insure an adequate sample size. The students completed the high school courses previously mentioned and completed the freshman year at the two universities.

Only course grades and averages were used as predictors and criteria, with no additional test scores, intelligence quotients, physical or psychological differences, or similar factors included in the study. Although these variables were not included, they would certainly merit further examination and perhaps additional value would be added to the results of this study.

IV. PREVIOUS RESEARCH

Because of the unique nature of the problem as it applied to the Abraham Lincoln High School, no local research studies had been previously attempted in this particular area. Since the guidance program at this high school was relatively new, this study is the first concerted attempt at a follow-up study of graduates and the investigator hopes to encourage others to further evaluate the success of our graduates, not only in the field of education, but in vocational and social areas as well.

However, other research of a similar nature has been conducted in this field. Garrett has perhaps best summarized the wealth of data in this area utilizing thirty-two diff-

erent studies and their corresponding coefficients of correlation. The coefficients ranged from +0.29 to +0.83 with a median coefficient of +0.56, all indicating positive correlations. According to Garrett, the five factors which have the greatest predictive value, and their average correlation with average college grades were:[7]

High School Scholarship. . . . . +0.56

General Achievement Test Scores. . . . +0.49

Intelligence Test Scores . . . . . +0.47

General College Aptitude Test Scores . +0.43

Special Aptitude Test Scores . . . . . +0.41

He further stated that, in the area of correlation between high school scholarship and college grades, the following effects were noted:

> High school scholarship correlates more highly with first year college grades.
> There is no consistent difference between men and women.
> Single high school scores correlate more highly with single college scores, than with several colleges, or several high schools.
> Although some degree of correlation has been found between high school grades in specific subjects and later college scholarship, no particular subject or subjects has exclusive rights to this relationship. Grades in "non academic" subjects predict equally as well as "academic" subjects.
> The pattern of high school subjects taken has little relation to later scholastic success in college.
> The total units or number of credits also exhibit little relationship to college success.[8]

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[7]Garrett, op. cit., p. 128.

[8]Garrett, op. cit.,p. 130

Garrett further concludes:

> Among all the factors contributing to the prediction on scholastic success in college, the student's average grade in high school continues to show the highest correlation with later college scholarship average. This seems to hold true whether the reports be of individual investigations or summaries of several like studies. The tendency is all the more convincing when the coefficients of correlation continue high in spite of variations in the weightings used to reduce high school grades to comparable averages, the size of the group studied, kind of marking system used, the length of the college course considered as a criterion and other factors which make it difficult to reduce the material to comparable data.[9]

Durflinger conducted a similar study showing the relationship of such factors as high school grade averages, intelligence, achievement, English grades, music background, personality, and various personal data to scholastic prediction. His study indicated little difference in the predictive value of these areas, with correlations from +0.477 to +0.562.[10] A study by Read at the University of Wichita indicated the high school average is an especially valuable predictor when most of the students come from the high schools of a single system. His study indicated a correlation of +0.674 between high school average and freshman average and little increase in correlation with the addition of

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[9]Garrett, op. cit., p. 93

[10]Glenn W. Durflinger, "Scholastic Prediction in a Teachers College," Journal of Experimental Education, 11:267, June, 1943.

predictors.[11] A study by Bolenbaugh and Proctor further adds to the value of high school grades as a predictor of college grades. Their study also indicated a small increase in the performance in college of students in vocational areas in high school rather than academic areas.[12] Brimm suggested that rather than predict success on the basis of single factors a profile chart would be more valuable. He stated that rank in class was the best single predictor for success in college but included the following in his profile chart: composite score on achievement batteries, reading test comprehension and speed, test scores on English expression, academic aptitude, rank in class, interest in school, study habits, and determination to go to college.[13] Hill offered a contradiction to the general acceptance of high school grades as valuable predictors of college grades when he stated:

> Better than average success in elementary and secondary school contributes to the success "Proneness".

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[11]Cecil B. Read, "Prediction of Scholastic Success in a Municipal University," School and Society, 48:188, August, 1938.

[12]Lawrence Bolenbaugh, and William Martin Proctor, "Relation of Subjects Taken in High School to Success in College," Journal of Educational Research, 15:92, February, 1937.

[13]R. P. Brimm, "Helping High School Students Predict Their Success in College," The Nation's Schools, 59:54, April, 1957

> Success, measured as it usually is by teachers' marks, is not necessarily a clear indicator of ability to succeed in college. While this index correlates higher with marks in college than any other single predictor, the correlation is woefully low if one is to predict individual chances of success in college....in some instances good marks are used as a basis for encouraging youngsters to attend college who later find their high school success must have been based on something other than academic ability or who really did not want college.[14]

A study by Munger also questions the ability of high school grades to predict anything beyond the first-year college grades and suggests that a certain level of aspiration is a strong factor in determining college success. He suggested that students who do not achieve grades which are near what they expect as a carry over from secondary schools are quite apt to drop out of college as a result.[15] Young commented on the success of college freshmen in predicting future success through their own judgment. He indicated a coefficient of correlation of +0.71 was found between self-prediction of scholastic achievement and actual achievement; one of +0.61 between self estimates of scholastic ability and test measures of that ability.[16]

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[14]George E. Hill, "College Proneness: A Guidance Problem," Personnel and Guidance Journal, 33:73, October, 1954.

[15]Paul F. Munger, "Student Persistence in College," Personnel and Guidance Journal, 35:243, December, 1956.

[16]F. Chandler Young, "College Freshmen Judge Their Own Scholastic Promise," Personnel and Guidance Journal 32:403, March, 1954.

One of the typical studies showing the relationship between first quarter grade point in college and subsequent success was by Jex and Sorenson. They reported a correlation of +0.81 between first quarter grades and cumulative grades and contended that first quarter grade point average has been repeatedly shown to be a good predictor of subsequent success.[17]

An earlier study at the Iowa State University by Lauer and Evans used first quarter college grades as the criterion and intelligence quotient scores, average high school grades, high school grades in English, math and history as predictors.

In the composite correlation the weighted average of high school grades indicated the highest correlation, with math grades offering the highest correlation of the separate subjects studied.[18]

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[17]Frank B. Jex, and A. Garth Sorenson, "Predictors of College Grades," Personnel and Guidance Journal, 31:297, February, 1953.

[18]A. R. Lauer, and J. E. Evans, "The Relative Predictive Value of Different High School Subjects on College Grades," School and Society, 31:160, February, 1930.

CHAPTER II

PROCEDURE

As indicated in the preceeding chapter, this study was limited to students who graduated from the Abraham Lincoln High School during the years 1949 to 1959 and who later completed the freshman year at either the Iowa State University or the University of Omaha. The selection of the subject matter areas was purely arbitrary in that the author had classroom experience in these fields and the results could therefore be of more value than results from less familiar subjects. Certainly further study in these areas would add to the prediction of college success.

In order to further limit the number of students included in the study, only those individuals who had completed three years of high school mathematics, science, and English were chosen. This group was further reduced by including only those who later completed freshman mathematics, science and English. However, since the number of students at the University of Omaha in this category was not statistically significant (less than 20) only results from the Iowa State University were used.

In order to utilize the data from the University of Omaha, another set of relationships was warranted. In this group were included all graduates from the Abraham Lincoln

High School from 1949 to 1959 who completed three years of high school English who later completed the freshman year and freshman English at the two universities.

The limitations imposed on this study were chosen in an attempt to increase the similarity between the two student groups. It was also assumed the college courses chosen would be reasonably similar at the two universities insofar as grades and course content were concerned. No attempt was made to categorize other variables such as college major, extra-curricular participation, extra-class jobs, or high school course emphasis.

High school grade averages were calculated from individual cumulative records at the Abraham Lincoln High School. College grade averages were obtained from official transcripts of the Iowa State University and from the registrar's office at the University of Omaha. Only averages which indicated course completion were used in this study.

J. P. Guilford's Fundamental Statistics in Psychology and Education was the principle guide in computing the statistics in this study.

The arithmetic mean was used as a measure of central tendency. The formula $M=\frac{\Sigma X}{N}$ was used to find the means.[1]

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[1] J. P. Guilford, Fundamental Statistics in Psychology and Education, (New York: McGraw-Hill Book Company, Inc., 1956) p. 54.

The standard deviation was used as the indicator of the degree of variability. The formula $\sigma = \frac{1}{N}\sqrt{N\Sigma X^2 - (\Sigma X)^2}$ was used to determine the standard deviations.[2]

The formula for finding the coefficients of correlation of the bivariate data was:[3]

$$r = \frac{n\Sigma XY - \Sigma X\Sigma Y}{\sqrt{n\Sigma X^2 - (\Sigma X)^2}\sqrt{n\Sigma Y^2 - (\Sigma Y)^2}}$$

Multivariate coefficients were also calculated using the Doolittle method for solving simultaneous equations. This method was described in detail by Guilford.[4]

Another method of calculating multivariate correlation was used. This procedure was the Wherry-Doolittle Method of Test Selection and as suggested by Guilford was described in full by Stead and Shartle.[5] This method was designed to assemble a battery of predictors without adding more than necessary for prediction and to prevent the introduction of error variance into the composite correlation. Regression weights for each variable were also determined to accurately weight each predictor.

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[2]Ibid., p. 94.

[3]Ibid., p. 140.

[4]Ibid., p. 405.

[5]W. H. Stead, and C. L. Shartle, et. al., Occupational Counseling Techniques, pp. 245-255, cited by J. P. Guilford, Fundamental Statistics in Psychology and Education, (New York: McGraw-Hill Book Company, Inc., 1956), p. 411.

The correlations were presented in matrix form and were tested for significance using Table 21 in the Tables for Statisticians.[6]

Scatter diagrams comparing high school grades and freshman college grades were constructed for each high school course and the overall high school average.

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[6]Herbert Arkin and Raymond R. Colton, Tables for Statisticians, (New York: Barnes and Noble, Inc., 1957), p. 139.

CHAPTER III

TREATMENT OF THE DATA

The data included in the study were divided into three groups. The figures, tables and discussion for the students who attended the Iowa State University and completed the freshman year and freshman mathematics, science and English are presented in Section I. The information for students who attended the Iowa State University and completed the freshman year and freshman English are presented in Section II. The data for the students who attended the University of Omaha and completed the freshman year and freshman English are presented in Section III. Section IV is devoted to comparisons of the data presented in the preceeding sections.

I. COMPLETE DATA FOR IOWA STATE UNIVERSITY STUDENTS

Sixty-two students were included in this group and the original data showing student number, high school grade average, high school mathematics average, high school average, high school English average, college freshman average and freshman averages in mathematics, science and English is tabulated in the Appendix.

A scatter diagram showing the high school average and the freshman average is found in Table I. The mean high school average of this group was 3.103 and the mean

freshman average was 2.352. The standard deviations were .605 and .705, respectively. Although this indicated a grade average reduction from high school to college, it showed forty-seven of the sixty-two with better than a "C" average and only four with a failing grade in college work.

Table II is a scatter diagram of high school mathematics and college mathematics grade averages. Again, there was a reduction from high school to college, from a mean of 3.042 to 2.490. The standard deviations were .734 and 1.108, respectively. Forty-seven of the sixty-two graduates received better than a "C" college mathematics average and eight a failing grade.

High school science averages and college science averages are shown in the scatter diagram in Table III. The mean high school average was 3.355 and the mean college science average was 2.366. The standard deviations were .592 and .892, respectively. Forty-nine of this group received better than a "C" average in college science and only six failed.

A scatter diagram of high school English averages and college English averages is presented in Table IV. The mean high school English average for this group was 3.166 and the mean college English average was 2.445. The standard deviations were .749 and .784, respectively.

TABLE I

SCATTER DIAGRAM OF HIGH SCHOOL GRADE POINT AVERAGES AND FRESHMAN GRADE POINT AVERAGES OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949-1959

Y: Freshman Grade Point Average	X: High School Grade Point Average													
	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0													1	1
3.5-3.7													3	3
3.2-3.4											3		3	6
2.9-3.1										1	1	1	2	5
2.6-2.8									2	1		2	3	8
2.3-2.5							1		1	4	3	2	2	13
2.0-2.2							1	1	4	2	2	1		11
1.7-1.9								1	2					3
1.4-1.6						1			2	2		1		6
1.1-1.3						1		1						2
0.8-1.0						1	1	1						3
0.5-0.7								1						1
0.2-0.4														
0.0-0.1														
f_x						3	3	5	11	10	9	7	14	62

Mean high school grade point average = 3.103
Mean freshman grade point average = 2.352

TABLE II

SCATTER DIAGRAM OF HIGH SCHOOL MATHEMATICS GRADE POINT AVERAGES AND FRESHMAN MATHEMATICS GRADE POINT AVERAGES OF SIXTY-TWO ABRAHAM LINCOLN STUDENTS ATTENDING IOWA STATE UNIVERSITY 1949-1959

Y: Freshman Mathematics Grade Point	X: High School Mathematics Grade Point													
	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.8	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0											1	1	6	8
3.5-3.7											1		3	4
3.2-3.4								1	1		2		3	7
2.9-3.1										4	3		4	11
2.6-2.8							1		1		1	1		4
2.3-2.5							1		1	1	1			4
2.0-2.2							2	1		4	1	1		9
1.7-1.9							1		1		1		1	4
1.4-1.6				1					1					2
1.1-1.3										1				1
0.8-1.0					1	1								2
0.5-0.7					1		1							2
0.2-0.4														
0.0-0.1						1	2	1						4
f_x				1	2	2	8	3	5	10	11	3	17	62

Mean high school mathematics grade point average = 3.042

Mean freshman mathematics grade point average = 2.490

TABLE III

SCATTER DIAGRAM OF HIGH SCHOOL SCIENCE GRADE POINT AVERAGES AND FRESHMAN SCIENCE GRADE POINT AVERAGES OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING IOWA STATE UNIVERSITY 1949-1959

X: High School Science Grade Point

Y: Freshman Science Grade Point	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.3-4.0													7	7
3.5-3.7													2	2
3.2-3.4												1	2	3
2.9-3.1									1	1	1		2	5
2.6-2.8													5	5
2.3-2.5										2	2	3	5	12
2.0-2.2							1	2	2	3	3	1	2	14
1.7-1.9									3			1		4
1.4-1.6								1	1					2
1.1-1.3								1	1					2
0.8-1.0								2				1	1	4
0.5-0.7							1							1
0.2-0.4														
0.0-0.1								1						1
f_x							2	7	8	6	6	7	26	62

Mean high school science grade point average = 3.355
Mean freshman science grade point average = 2.366

TABLE IV

SCATTER DIAGRAM OF HIGH SCHOOL ENGLISH GRADE POINT AVERAGES AND FRESHMAN ENGLISH GRADE POINT AVERAGES OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING TOMA STATE UNIVERSITY 1949-1959

Y: Freshman English Grade Point	X: High School English Grade Point														
	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0												1	6	7
3.5-3.7													1	1
3.2-3.4													1	1
2.9-3.1											2		6	8
2.6-2.8									3	1	2		5	11
2.3-2.5								1		1	1		3	6
2.0-2.2				1	1		3	1	2	2	1	1	2	14
1.7-1.9							2			2	1			5
1.4-1.6						1	2		1					4
1.1-1.3						1			2					3
0.8-1.0									1				1	2
0.5-0.7														
0.2-0.4														
0.0-0.1														
f_x				1	1	2	7	2	9	6	7	2	25	62

Mean high school English grade point average = 3.166
Mean freshman English grade point average = 2.445

In addition to scatter diagrams, several correlative techniques were employed to determine the effectiveness of prediction. Treating each high school grade and each college grade as bivariate data, product-moment correlation coefficients were determined.

The correlation matrix for this data is presented in Table VI of the Appendix. The correlations were all significant at the five per cent level of significance or better.[1] The entire matrix indicated positive correlations ranging from .404 between college English grades and college science grades to .849 between high school composite grades and high school science grades. However, these grades were not practical as college predictors since one could not be determined prior to college attendance and the other did not contain a college average. The highest correlation between a high school average and overall freshman college average was .752 for high school science. The poorest was .684 for overall high school average. Correlations between high school math, high school English, respectively, and overall college average were .728 and .685.

In an effort to determine the effect of combinations of variables as predictors, several multivariate correlations were calculated.

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[1]Herbert Arkin and Raymond R. Colton, Tables for Statisticians, (New York: Barnes and Noble, Inc.) 1957, p. 139.

The correlation matrices used in these calculations are presented in Table V, VI, VII and VIII. The same predictors were used in each calculation and the criterion for each multiple was varied to include freshman college average, freshman mathematics average, freshman science average, and freshman English average.

To indicate the positive nature of the multiple correlations the following null hypothesis was presented for each group of predictors and criterion: H_o: R = .000 (no correlation). The alternate hypothesis was: H_a: R > .000 (positive correlation). As a result of the Wherry Doolittle calculations the null hypothesis was rejected at the five per cent level of significance and the alternate was accepted in all four computations of multiple predictors. This indicated positive correlation for all the multiple predictors. However, further calculations of F values indicated the addition of more variables did not contribute to the correlation, at the five percent level of significance.[2] This was apparent in all four multiple correlation computations.

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[2]Arkin and Colton, op. cit., p. 118

TABLE V

CORRELATION MATRIX OF HIGH SCHOOL GRADES IN MATHEMATICS, SCIENCE AND ENGLISH AND OVERALL COLLEGE AVERAGE OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949 to 1959

	X1	X2	X3	X4	X0
X1	1.000	.865	.849	.808	.684
X2		1.000	.838	.770	.728
X3			1.000	.781	.752
X4				1.000	.685
X0					1.000

X1: Overall High School Average
X2: High School Mathematics Average
X3: High School Science Average
X4: High School Science Average
X0: Overall Freshman College Average

TABLE VI

CORRELATION MATRIX OF HIGH SCHOOL GRADES IN MATHEMATICS, SCIENCE, AND ENGLISH AND COLLEGE MATHEMATICS AVERAGE OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949 to 1959

	X1:	X2	X3	X4	X0
X1	1.000	.865	.849	.808	.662
X2		1.000	.838	.770	.741
X3			1.000	.781	.692
X4				1.000	.588
X0					1.000

X1: Overall High School Average
X2: High School Mathematics Average
X3: High School Science Average
X4: High School English Average
X0: Freshman Mathematics Average

TABLE VII

CORRELATION MATRIX OF HIGH SCHOOL GRADES IN MATHEMATICS, SCIENCE AND ENGLISH AND COLLEGE SCIENCE AVERAGES OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949 to 1959

	X1	X2	X3	X4	X0
X1	1.000	.865	.849	.808	.604
X2		1.000	.838	.770	.581
X3			1.000	.781	.670
X4				1.000	.594
X0					1.000

X1: Overall High School Average
X2: High School Mathematics Average
X3: High School Science Average
X4: High School English Average
X0: Freshman Science Average

TABLE VIII

CORRELATION MATRIX OF HIGH SCHOOL GRADES IN MATHEMATICS, SCIENCE AND ENGLISH AND COLLEGE ENGLISH AVERAGES OF SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949 to 1959

	X1	X2	X3	X4	X0
X1	1.000	.865	.849	.808	.617
X2		1.000	.838	.770	.500
X3			1.000	.781	.583
X4				1.000	.618
X5					1.000

X1: Overall High School Average
X2: High School Mathematics Average
X3: High School Science Average
X4: High School English Average
X0: Freshman English Average

II. IOWA STATE UNIVERSITY ENGLISH STUDENTS

One hundred two students were included in this group and the original data showing student number, high school grade average, high school English average, college freshman average and college English average is tabulated in the Appendix. This group included the students in the previous group in addition to others who had completed high school and high school English but not college courses in mathematics and science.

A scatter diagram showing high school average and freshman college average is presented in Table IX. The mean high school average for this group was 3.227 and the mean freshman average was 2.565 which indicated a reduction of grade point average from high school to college. The standard deviations were .609 and .767, respectively.

Eighty-five of the 102 earned "C" or better as freshman and six failed.

Table X shows a scatter diagram of high school English grade average and college English grade average. The mean high school English average, for this group was 3.348 and the mean college English average was 2.689. The standard deviations were .779 and .826, respectively. Seventy-seven of the one hundred two students earned "C" or better in freshman English and four failed.

Bivariate correlation coefficients were calculated for this group and are presented in Table XI. There was no significant difference between the coefficients for high school average and college average and high school English average and freshman English average. The former was .651 and the latter was .653.

A multiple correlation using high school average, high school English average, and freshman English average as predictors of college average was computed. This computation produced a multiple correlation of .712 which was only slightly larger than the highest single correlation of .653. Regression weights of .308 for freshman English, .294 for high school English, and .195 for high school average were also calculated.

III. UNIVERSITY OF OMAHA ENGLISH STUDENTS

Thirty-seven students were included in this group and the original data showing student number, high school grade average, high school English grade average, freshman grade average, and freshman English grade average are tabulated in the Appendix.

A scatter diagram showing high school average and freshman average is presented in Table XII. The mean high school average of this group was 2.835 and the mean freshman average was 2.178. The standard deviations were .465 and .675, respectively. Twenty-four students earned a "C"

TABLE IX

SCATTER DIAGRAM OF HIGH SCHOOL GRADE POINT AVERAGES AND FRESHMAN GRADE POINT AVERAGES OF THE ONE HUNDRED TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING IOWA STATE UNIVERSITY 1949-1959

Y: Freshman Grade Point Average \ X: High School Grade Point Average	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0													2	2
3.5-3.7													2	2
3.2-3.4										1	3	1	6	11
2.9-3.1									1	2	2	1	4	10
2.6-2.8									2	2	2	3	6	15
2.3-2.5							1	1	1	5	5	3	2	18
2.0-2.2							2	2	5	4	2	2		17
1.7-1.9								1	4		2	1		8
1.4-1.6						1	1		2	2		1		7
1.1-1.3						2		3	1					6
0.8-1.0						1	1	2						4
0.5-0.7								1						1
0.2-0.4								1						1
f_x						4	5	11	16	16	16	12	22	102

Mean high school grade point average = 3.227
Mean freshman grade point average = 2.565

TABLE X

SCATTER DIAGRAM OF HIGH SCHOOL ENGLISH GRADE POINT AVERAGES AND FRESHMAN ENGLISH GRADE POINT AVERAGES OF THE ONE HUNDRED TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING IOJA STATE UNIVERSITY, 1949-1959

Y: Freshman English Grade Point Average	X: High School English Grade Point Average													
	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0												1	10	11
3.5-3.7													2	2
3.2-3.4													1	1
2.9-3.1										1	3	1	11	16
2.6-2.8									3	1	3	1	6	14
2.3-2.5								2	2	1	1	1	4	11
2.0-2.2				1	1		3	2	4	3	3	2	3	22
1.7-1.9					1		6			5	1			13
1.4-1.6						1	2		1					4
1.1-1.3						1			2		1			4
0.8-1.0									1				1	2
0.5-0.7														
0.2-0.4														
0.0-0.1				1	1		1							2
f_x			1	3	2	12	4	13	11	12	6	38		102

Mean high school English grade point average = 3.348
Mean freshman English grade point average = 2.689

TABLE XI

CORRELATION MATRIX OF OVERALL HIGH SCHOOL GRADES, HIGH SCHOOL ENGLISH GRADES AND FRESHMAN ENGLISH GRADES AND OVERALL COLLEGE AVERAGE OF ONE HUNDRED TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949 to 1959

	X1	X2	X3	X0
X1	1.000	.880	.642	.651
X2		1.000	.608	.653
X3			1.000	.612
X0				1.000

X1: Overall High School Average
X2: High School English Average
X3: Freshman English Average
X0: Overall Freshman Average

TABLE XII

SCATTER DIAGRAM OF HIGH SCHOOL GRADE POINT AVERAGES AND FRESHMAN GRADE POINT AVERAGES OF THE THIRTY-SEVEN ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE UNIVERSITY OF OMAHA, 1949-1959

Y: Freshman Grade Point Average	X: High School Grade Point Average													
	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0														
3.5-3.7													1	1
3.2-3.4									1				1	2
2.9-3.1										1	1	1		3
2.6-2.8									2		3			5
2.3-2.5								1	2	2			1	6
2.0-2.2								1	4	2				7
1.7-1.9									2	1				3
1.4-1.6							1	2		1				4
1.1-1.3								2						2
0.8-1.0							2			1				3
0.5-0.7								1						1
0.2-0.4														
0.0-0.1														
f_x							3	7	11	8	4	1	3	37

Mean high school grade point average = 2.835
Mean freshman grade point average = 2.178

average or better and one failed.

A scatter diagram showing high school English average and freshman English average is presented in Table XIII. The mean high school English average of this group was 2.859 and mean freshman English average was 2.010. The standard deviations were .596 and .694, respectively. Twenty-six students earned a "C" average or better and one failed.

Correlation techniques applied to this group indicated correlations of .464 between high school grade average and freshman grade average and .386 between high school English average and freshman English average. The correlation matrix for these data is presented in Table XIV.

A multiple correlation coefficient was also calculated. However, since the correlation between freshman English and freshman overall average, .718, was rather high in comparison to the other variables, this variable probably contributed more to the overall increase in multiple correlation obtained was .719 with regression weights of .747 applied to freshman English and .038 and -.111 applied to high school English and overall high school average, respectively.

Original data for the group of six students at the University of Omaha who completed three years of high school mathematics, science and English are presented in the Appendix. Due to the small number of students

TABLE XIII

SCATTER DIAGRAM OF HIGH SCHOOL ENGLISH GRADE POINT AVERAGES AND FRESHMAN ENGLISH GRADE POINT AVERAGES OF THE THIRTY SEVEN ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE UNIVERSITY OF OMAHA, 1949-1959

X: High School English Grade Point Average

Y: Freshman English Grade Point Average	0.2-0.4	0.5-0.7	0.8-1.0	1.1-1.3	1.4-1.6	1.7-1.9	2.0-2.2	2.3-2.5	2.6-2.8	2.9-3.1	3.2-3.4	3.5-3.7	3.8-4.0	f_y
3.8-4.0														
3.5-3.7													2	2
3.2-3.4														
2.9-3.1							1				1	1	1	4
2.6-2.8														
2.3-2.5									2		1	1		4
2.0-2.2							2	3	3	4	2	1	1	16
1.7-1.9														
1.4-1.6							3			2				5
1.1-1.3						1	1							2
0.8-1.0						1			1	1				3
0.5-0.7										1				1
0.2-0.4														
0.0-0.1														
f_x						2	7	3	6	8	4	3	4	37

Mean high school English grade point average = 2.859
Mean freshman English grade point average = 2.010

TABLE XIV

CORRELATION MATRIX OF OVERALL HIGH SCHOOL GRADES, HIGH SCHOOL ENGLISH GRADES AND FRESHMAN ENGLISH GRADES AND OVERALL FRESHMAN COLLEGE AVERAGE OF THIRTY SEVEN ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE UNIVERSITY OF OMAHA 1949 to 1959

	X1	X2	X3	X0
X1	1.000	.773	.679	.464
X2		1.000	.539	.386
X3			1.000	.718
X0				1.000

X1: Overall High School Average
X2: High School English Average
X3: Freshman English Average
X0: Overall Freshman Average

involved no correlations were calculated for this group. However, the mean grade averages for this group differed only slightly from the mean grade averages for the thirty-seven students from the University of Omaha previously studied.

IV. COMPARISON OF THE DATA

Since the two groups presented in sections two and three offered the only valid means of comparison, the group of sixty-two students described in section one was omitted.

The data summary for these two groups is presented in Table XV. The mean high school average for students who attended Iowa State University was 3.227 and for the University of Omaha was 2.835. The mean high school English average for students who attended the Iowa State University was 3.348 and for the University of Omaha was 2.859. The mean freshman average for students who attended Iowa State University was 2.565 and for the University of Omaha was 2.178. The mean freshman English average for students who attended Iowa State University was 2.689 and for the University of Omaha was 2.010.

Correlation coefficients between high school averages and freshman averages for students attending the Iowa State University were .651 and .653 and for students attending the University of Omaha, .464 and .386.

Of the students who attended the Iowa State University, eighty-five of one hundred two earned an overall average of "C" or better and six of one hundred two failed. Seventy-seven of the one hundred two earned an average of "C" or better in freshman English and four of the one hundred two failed.

Of the students who attended the University of Omaha, twenty-four of thirty-seven earned an overall freshman average of "C" or better and one of thirty-seven failed. Twenty-six of the thirty-seven earned an average of "C" or better in freshman English and one of thirty-seven failed.

The multiple correlations for the two groups varied only slightly. The figure for the group attending the Iowa State University was .712 and for the group attending the University of Omaha was .719.

TABLE XV

DATA SUMMARY FOR ABRAHAM LINCOLN HIGH SCHOOL GRADUATES ATTENDING THE IOWA STATE UNIVERSITY AND THE UNIVERSITY OF OMAHA, 1949 to 1959

	Iowa State University students	University of Omaha students
Number of students	102	37
number with "C" average or better	85	24
number failing	6	1
number with "C" or better in freshman English	77	26
number failing freshman English	4	1
r for high school and freshman grades	.651	.464
r for high school and freshman English grades	.653	.386
R values	.712	.719
mean high school overall	3.227	2.835
mean high school English	3.348	2.859
mean college overall	2.565	2.178
mean college English	2.689	2.010

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the relationship between achievements of high school students at the Abraham Lincoln High School, Council Bluffs, Iowa and success in college at the Iowa State University and the University of Omaha. High school achievement was measured in terms of the overall high school grade average and grade averages in mathematics, science and English. Success in college was measured by the overall freshman grade average and grade averages in freshman mathematics, freshman science and freshman English. Grades were used to indicate successfull completion of the freshman year.

Graduates of the Abraham Lincoln High School from 1949 to 1959 who later attended these two universities were used in the study. This group was then divided into one segment which had completed work in all the subjects studied, both in high school and in college, and another segment which had completed work in high school and college English. The former group included only students attending the Iowa State University since only six students from the University of Omaha fitted this category.

The mean and standard deviation were calculated for each set of information. Scatter diagrams showing grades in high school and college were constructed for each pair of relationships. Coefficients of correlation, both bivariate and multivariate, were computed for each set of predictors and criterion and the results for each university were then evaluated and compared. Summaries of the original data are presented in the Appendix in Tables I, II, III, IV and V.

Conclusions

The coefficients of correlation in all the areas measured indicated a high positive correlation. All the relationships were found to be statistically significant at the .05 level. On the basis of these calculations, high school averages in specific courses and overall were effective predictors of college success, as measured by college grades.

Combinations of predictors in a multiple correlation situation did not significantly increase the effectiveness of prediction. In fact, single predictors were sufficient to determine college grades in specific subjects or overall.

In general, students from the Abraham Lincoln High School attending the Iowa State University had higher grade averages in high school and in college than did those attending the University of Omaha. However, both groups

evidenced large percentages of passing grades or better and few failures, although there was a reduction of grade average from high school to college in all areas studied. Graduates from Abraham Lincoln High School with similar courses of study and similar high school grade averages who attend these universities should therefore expect somewhat lower grades in college than in high school with a good chance for successful completion of the freshman year.

Recommendations

Since this study was limited to a rather narrow set of variables the results had meaning only in the areas chosen for analysis. As was previously mentioned, other subject matter areas, intelligence quotient scores, aptitude test scores, achievement test scores, college major, and other similar variables, could serve as valuable predictors of college success.

Since research in this area was quite extensive this study was primarily designed to provide data for counselors at the local high school level rather than to duplicate previous studies in other institutions. Further analysis of success of Abraham Lincoln High School graduates in other colleges would add to the information provided by this study. Additional studies in vocational as well as educational fields would also merit scrutiny.

The scatter diagrams and correlative studies could be utilized by the counseling staff to assist future graduates in making advanced educational plans. As indicated, an organized guidance program at the Abraham Lincoln High School was just beginning to emerge and data of this nature would be extremely valuable in assisting the counselor to increase the effectiveness of counseling. The investigator desired that the results of this study would serve as an impetus for others to undertake similar projects with the goal of achieving a counseling program meriting student acceptance and confidence.

APPENDIX

TABLE I

THE NUMBER, HIGH SCHOOL GRADE POINT AVERAGE, HIGH SCHOOL ENGLISH GRADE POINT AVERAGE, FRESHMAN GRADE POINT AVERAGE, FRESHMAN ENGLISH GRADE POINT AVERAGE, OF THE ONE HUNDRED-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING IOWA STATE UNIVERSITY, 1949 to 1959

Number of Student	High School Grade Point	English Grade Point	Freshman Grade Point	English Grade Point
1	2.7	3.8	2.8	2.7
2	2.9	3.5	3.1	2.7
3	3.8	3.8	3.4	2.7
4	2.9	3.2	2.2	3.0
5	3.0	3.4	3.0	2.0
6	2.8	3.0	2.2	1.7
7	4.0	4.0	3.0	3.0
8	1.8	2.0	1.5	1.5
9	2.2	2.8	2.4	2.7
10	3.4	4.0	2.4	3.0
11	3.1	3.0	2.8	3.0
12	2.9	3.6	2.4	3.0
13	2.9	3.3	2.5	3.0
14	3.3	3.8	2.2	2.7
15	3.9	3.8	2.8	3.0
16	3.9	3.8	2.5	2.0
17	1.8	1.6	1.2	1.8
18	3.7	3.3	2.8	2.0
19	2.2	2.0	1.5	1.8
20	2.4	1.2	.5	2.0
21	2.8	3.3	1.8	2.7
22	2.8	2.2	2.1	1.7
23	2.4	2.4	2.3	2.3
24	2.4	2.2	2.2	1.7
25	2.7	2.2	2.6	2.0
26	4.0	4.0	3.8	3.7
27	2.7	2.6	2.0	1.5
28	3.9	4.0	3.0	3.7
29	4.0	4.0	2.8	2.3
30	3.4	3.8	2.6	3.0
31	3.0	2.6	2.2	2.3
32	3.2	3.0	3.1	1.8
33	2.7	2.4	2.2	2.0
34	2.3	1.5	.4	.0
35	3.9	4.0	3.6	3.0
36	2.9	3.0	2.0	1.8

TABLE I (CONTINUED)

Number of Student	High School Grade Point	English Grade Point	Freshman Grade Point	English Grade Point
37	2.4	2.0	2.1	1.8
38	2.8	2.8	1.9	2.0
39	3.4	3.3	2.3	2.8
40	2.9	2.6	2.0	2.0
41	3.9	4.0	2.5	2.5
42	4.0	4.0	2.7	3.8
43	3.7	3.6	2.0	2.3
44	3.9	4.0	2.8	3.0
45	2.5	2.2	.8	1.8
46	3.6	3.1	2.3	1.8
47	4.0	4.0	3.0	4.0
48	4.0	4.0	2.6	3.0
49	2.5	2.5	1.3	2.3
50	3.0	2.0	2.3	2.0
51	3.9	3.8	2.8	4.0
52	3.4	3.2	2.8	3.0
53	3.0	3.3	2.5	1.8
54	3.0	2.4	2.8	2.0
55	3.2	3.0	2.4	2.0
56	3.9	4.0	3.0	3.8
57	2.6	2.8	1.3	2.3
58	3.6	3.8	2.9	2.8
59	3.8	3.8	3.2	3.8
60	1.9	1.6	1.3	2.0
61	2.4	2.8	1.8	2.0
62	3.2	3.0	2.1	1.8
63	3.7	3.8	2.6	3.3
64	3.9	4.0	3.2	3.0
65	2.7	2.2	1.9	2.0
66	3.5	4.0	2.3	2.0
67	2.9	3.0	1.6	2.0
68	3.1	2.8	1.6	1.3
69	2.4	2.2	1.2	1.8
70	3.3	3.5	2.3	2.0
71	3.4	3.5	2.9	2.0
72	2.5	2.2	1.0	1.5
73	2.8	2.8	2.3	2.8
74	3.2	3.0	3.3	2.3
75	3.5	3.5	2.8	4.0
76	3.5	3.8	2.2	3.0
77	3.8	4.0	3.3	2.3
78	2.8	3.2	1.8	2.8
79	3.4	3.8	2.3	2.8

TABLE I (CONTINUED)

Number of Student	High School Grade Point	English Grade Point	Freshman Grade Point	English Grade Point
80	3.5	4.0	1.8	3.0
81	2.4	2.8	1.3	2.0
82	2.7	2.8	1.6	1.3
83	2.6	3.2	2.0	2.3
84	3.0	3.3	2.4	2.0
85	2.0	1.8	1.0	1.5
86	3.7	4.0	3.3	3.0
87	2.2	1.8	2.2	1.3
88	3.2	3.8	1.8	2.0
89	2.0	2.2	2.1	.0
90	3.5	3.8	2.3	2.8
91	3.4	4.0	3.2	2.3
92	3.8	4.0	3.4	3.8
93	3.9	4.0	3.8	3.8
94	3.8	4.0	3.5	4.0
95	1.8	2.8	1.0	1.0
96	3.2	3.2	1.8	1.3
97	3.5	3.8	1.5	1.0
98	3.0	3.0	3.2	2.0
99	2.6	3.0	1.6	2.8
100	3.8	4.0	3.7	4.0
101	3.3	3.8	3.2	3.8
102	2.6	2.8	2.9	2.8

TABLE II

THE NUMBER, HIGH SCHOOL GRADE POINT AVERAGE, HIGH SCHOOL MATHEMATICS GRADE POINT AVERAGE, HIGH SCHOOL SCIENCE GRADE POINT AVERAGE, HIGH SCHOOL ENGLISH GRADE POINT AVERAGE, FRESHMAN GRADE POINT AVERAGE, FRESHMAN MATHEMATICS GRADE POINT AVERAGE, FRESHMAN SCIENCE GRADE POINT AVERAGE, FRESHMAN ENGLISH GRADE POINT AVERAGE, OF SIXTY TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING IOWA STATE UNIVERSITY, 1949-1959

Number of Student	H. S. Grade Point	Math Grade Point	Sci. Grade Point	English Grade Point	Freshman Grade Point	Math Grade Point	Sci. Grade Point	Eng. Grade Point
1	2.7	3.0	4.0	3.8	2.8	3.0	3.3	2.7
2	2.9	3.3	3.2	3.2	2.2	1.7	2.0	3.0
3	2.8	2.8	3.5	3.0	2.2	3.3	2.0	1.7
4	1.8	2.3	2.5	2.0	1.5	0.0	1.0	1.5
5	2.2	2.8	3.2	2.8	2.4	2.5	3.0	2.7
6	2.9	3.2	3.3	3.3	2.5	2.7	2.3	3.0
7	3.3	3.0	3.0	3.8	2.2	2.6	2.0	2.7
8	3.9	3.8	4.0	3.8	2.8	3.3	2.3	3.0
9	3.9	4.0	3.8	3.8	2.5	4.0	2.5	2.0
10	2.4	2.0	2.5	1.2	0.5	0.0	0.0	2.0
11	2.8	3.2	2.5	2.2	2.1	3.0	1.0	1.7
12	2.7	2.8	3.3	2.2	2.6	2.7	2.0	2.0
13	4.0	4.0	4.0	4.0	3.8	4.0	4.0	3.7
14	2.7	1.9	2.8	2.6	2.0	1.0	1.5	1.5
15	3.9	3.8	4.0	4.0	3.6	4.0	4.0	3.0
16	2.4	2.0	2.5	2.0	2.1	2.0	2.0	1.8
17	3.4	3.3	3.2	3.3	2.3	3.0	2.0	2.8
18	2.9	2.5	3.0	2.6	2.0	2.0	2.0	2.0
19	3.9	3.5	4.0	4.0	2.5	2.2	3.0	2.5
20	3.9	3.8	3.8	4.0	2.8	3.3	2.3	3.0
21	4.0	4.0	4.0	4.0	3.0	3.0	2.8	4.0
22	4.0	4.0	4.0	4.0	2.6	3.0	2.3	3.0
23	2.5	1.8	2.5	2.5	1.3	0.0	2.0	2.3
24	3.0	3.2	3.5	2.0	2.3	3.0	2.3	2.0
25	3.0	3.0	2.8	3.3	2.5	3.0	3.0	1.8
26	3.0	3.2	3.5	2.4	2.8	3.5	3.3	2.0
27	3.2	3.2	3.5	3.0	2.4	3.3	2.3	2.0
28	3.9	3.3	4.0	4.0	3.0	3.8	2.8	3.8
29	3.6	3.8	3.8	3.8	2.9	3.0	4.0	2.8
30	3.8	4.0	3.8	3.8	3.2	3.0	2.8	3.8
31	1.9	1.3	2.0	1.6	1.3	1.5	2.0	2.0
32	2.4	2.8	2.8	2.8	1.8	2.0	1.3	2.0
33	3.2	3.0	3.2	3.0	2.1	2.0	2.3	1.8

TABLE II (Continued)

Number of Student	H. S. Grade Point	Math Grade Point	Sci. Grade Point	English Grade Point	Freshman Grade Point	Math Grade Point	Sci. Grade Point	Eng. Grade Point
34	3.7	3.8	4.0	3.8	2.6	3.8	3.5	3.3
35	3.9	4.0	3.8	4.0	3.2	3.3	3.8	3.0
36	2.7	1.6	3.0	2.2	1.9	1.0	2.3	2.0
37	3.5	3.3	4.0	4.0	2.3	2.3	2.3	2.0
38	2.9	3.0	3.5	3.0	1.6	2.0	1.0	2.0
39	3.1	3.0	3.8	2.8	1.6	1.3	2.0	1.3
40	3.4	3.5	4.0	3.5	2.9	3.8	2.8	2.0
41	2.5	2.0	2.3	2.2	1.0	0.0	1.5	1.5
42	2.8	2.8	3.0	2.8	2.3	1.8	2.0	2.8
43	3.2	3.8	4.0	3.0	3.3	4.0	3.8	2.3
44	3.5	3.5	3.8	3.5	2.8	2.8	2.0	4.0
45	3.5	2.7	3.5	3.8	2.2	1.5	1.8	3.0
46	3.8	4.0	4.0	4.0	3.3	3.8	3.8	2.3
47	2.8	2.2	2.8	3.2	1.8	2.3	1.8	2.8
48	3.4	3.2	3.0	3.8	2.3	2.0	2.3	2.8
49	2.7	3.0	2.8	2.8	1.6	2.0	2.0	1.3
50	2.6	2.0	2.8	3.2	2.0	2.0	1.8	2.3
51	3.0	3.0	3.5	3.3	2.4	3.0	2.3	2.0
52	2.0	1.6	2.8	1.8	1.0	0.5	2.0	1.5
53	2.2	2.5	2.5	1.8	2.2	3.3	1.3	1.3
54	3.5	3.8	3.8	3.8	2.3	3.5	2.8	2.8
55	3.4	3.3	4.0	4.0	3.2	3.3	3.3	2.3
56	3.8	4.0	4.0	4.0	3.5	3.5	3.8	4.0
57	1.8	2.0	2.0	2.8	1.0	0.5	0.5	1.0
58	3.5	4.0	4.0	3.8	1.5	1.8	1.0	1.0
59	2.6	2.2	2.8	3.0	1.6	1.8	1.8	2.8
60	3.8	4.0	4.0	4.0	3.7	3.5	4.0	4.0
61	3.3	3.0	4.0	3.8	3.2	3.0	3.0	3.8
62	2.6	2.2	3.0	2.8	2.9	2.8	3.0	2.8

TABLE III

THE NUMBER, HIGH SCHOOL GRADE POINT AVERAGE, HIGH SCHOOL ENGLISH GRADE POINT AVERAGE, FRESHMAN GRADE POINT AVERAGE, FRESHMAN ENGLISH GRADE POINT AVERAGE, OF THIRTY-SEVEN ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE UNIVERSITY OF OMAHA, 1949-1959

Number of Student	High School Grade Point	English Grade Point	Freshman Grade Point	English Grade Point
1	2.8	2.8	2.8	2.5
2	2.9	3.0	1.6	.5
3	2.9	3.0	1.9	2.0
4	2.7	2.2	1.8	2.0
5	3.4	4.0	2.8	3.0
6	2.7	3.3	2.4	2.0
7	2.9	2.0	3.0	3.0
8	2.8	3.0	1.9	2.0
9	2.4	3.0	1.6	1.5
10	2.7	3.0	2.6	2.0
11	2.6	2.5	3.3	2.0
12	3.4	3.8	2.6	2.0
13	2.1	1.9	1.0	1.1
14	2.5	2.1	1.3	1.1
15	2.6	2.5	2.1	2.1
16	3.8	3.5	2.5	3.1
17	3.0	2.8	.9	1.0
18	2.7	3.0	2.2	2.0
19	2.5	2.8	2.0	2.5
20	2.9	3.3	2.4	2.5
21	2.2	2.0	.0	1.5
22	4.0	4.0	3.6	3.5
23	2.3	2.5	1.6	2.0
24	3.2	3.5	2.7	2.5
25	2.4	2.0	2.3	2.0
26	2.4	2.2	1.1	1.5
27	2.6	3.0	2.3	1.5
28	2.5	1.8	.7	1.0
29	3.4	3.3	3.1	3.0
30	2.2	3.0	1.6	1.0
31	2.9	2.6	2.2	2.0
32	2.9	2.8	2.2	2.0
33	3.8	3.8	3.2	3.5
34	2.6	2.2	2.0	1.5
35	2.6	2.8	2.1	2.0
36	3.7	3.5	2.9	2.0
37	2.9	3.3	2.3	2.0

TABLE IV

THE NUMBER, HIGH SCHOOL GRADE POINT AVERAGE, HIGH SCHOOL MATHEMATICS GRADE POINT AVERAGE, FRESHMAN GRADE POINT AVERAGE, FRESHMAN MATHEMATICS GRADE POINT AVERAGE, OF SIX ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE UNIVERSITY OF OMAHA, 1949-1959

Number of Student	High School Grade Point	Math Grade Point	Freshman Grade Point	Math Grade Point
1	2.6	2.8	1.6	1.5
2	3.2	3.3	3.1	3.5
3	2.6	2.8	2.0	2.0
4	2.7	2.8	2.2	2.5
5	3.2	2.1	2.7	3.5
6	3.0	2.5	2.0	2.0

TABLE V

THE NUMBER, HIGH SCHOOL GRADE POINT AVERAGE, HIGH SCHOOL SCIENCE GRADE POINT AVERAGE, FRESHMAN GRADE POINT AVERAGE, FRESHMAN SCIENCE GRADE POINT AVERAGE OF SIX ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE UNIVERSITY OF OMAHA 1949-1959

Number of Student	High School Grade Point	Science Grade Point	Freshman Grade Point	Science Grade Point
1	2.9	3.2	1.6	1.0
2	2.2	2.2	2.6	2.0
3	3.2	2.8	3.0	3.0
4	2.6	2.8	2.0	1.5
5	2.7	2.8	2.2	2.0
6	3.2	3.5	2.7	2.5

TABLE VI

CORRELATION MATRIX FOR OVERALL HIGH SCHOOL GRADE AVERAGE, HIGH SCHOOL MATHEMATICS, SCIENCE AND ENGLISH GRADE AVERAGES AND OVERALL FRESHMAN COLLEGE GRADE AVERAGE AND FRESHMAN MATHEMATICS, SCIENCE AND ENGLISH GRADE AVERAGES FOR SIXTY-TWO ABRAHAM LINCOLN HIGH SCHOOL STUDENTS ATTENDING THE IOWA STATE UNIVERSITY 1949 to 1959

	X1	X2	X3	X4	X5	X6	X7	X0
X1	1.000	.865	.849	.808	.662	.604	.617	.684
X2		1.000	.838	.770	.741	.581	.500	.728
X3			1.000	.781	.692	.670	.583	.752
X4				1.000	.588	.594	.618	.685
X5					1.000	.684	.465	.833
X6						1.000	.404	.848
X7							1.000	.676
X0								1.000

X1: Overall High School Average
X2: High School Mathematics Average
X3: High School Science Average
X4: High School English Average
X5: Freshman Mathematics Average
X6: Freshman Science Average
X7: Freshman English Average
X0: Overall Freshman Average

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