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PREVIEW

**RELATIONSHIPS BETWEEN FACTORS OF HIGH SCHOOL
BACKGROUND AND ACHIEVEMENT IN CERTAIN
SUBJECT FIELDS**

by

Harvon LeRoy Snider

A DISSERTATION

**Presented to the Faculty of
The Graduate College in the University of Nebraska
in Partial Fulfillment of Requirements
For the Degree of Doctor of Philosophy
Department of Secondary Education**

Under the Supervision of Professor Galen Saylor

Lincoln, Nebraska

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CHAPTER I

THE PROBLEM OF THIS STUDY

America has long had a deep faith in education. As a nation we have prided ourselves on the attainment of our free and universal system of schools. We have come to believe that education is the key to successful living. We have looked with favor upon our boys and girls, graduates of our secondary schools, successfully entering institutions of higher learning, carrying on work in vocational training schools, and filling positions and jobs of various kinds. We have been happy that our leaders and statesmen have been able to direct the life of our country and, in a measure, to direct the life of the world. We have come to say that the strength of our democracy depends upon the quantity and quality of our education.

However, there are those who feel that our schools are not accomplishing everything they should. One such group has the following to say:

"In spite of substantial achievements by the public high school and its significant contribution to many American youth, the depression years preceeding the war revealed certain inadequacies in its program. The pressures and dislocations of this period sufficiently magnified and intensified former problems to arouse the American people to a realization that the high school was not adequately serving American boys and girls. - - - Many citizens were shocked by the reports of youth studies which indicated that the high schools had never enrolled more than two-thirds of the youth of secondary school age. The thousands of boys and girls, unwanted by

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business and industry, who were completely unoccupied during the depression years emphasized the problem. The high school, society's principal youth-serving agency, had no program which could attract them or serve their needs. Studies such as those of the American Youth Commission and the New York State Regents' Inquiry presented conclusive evidence on the inadequacy of the high school in aiding a large segment of youth to meet the problems which they were actually encountering. Neither in preparation for citizenship nor in preparation for a vocation were the schools found to be doing outstanding work. Guidance services were almost nonexistent. The problem of preparing the few for college seemed to dominate all activities of the schools."¹

As we face the realization that our schools may not be measuring up to the high task we have set for them and as we face other intense problems in our world today, our citizens more and more are turning their attention to the schools. The public and educators alike are concerned about our secondary schools and are interested in improving them and in making them the best schools possible. Actually, we have little research that helps us determine what kind of school will provide the best education for boys and girls. Academic achievement has always been considered as an important part of our educational objectives for secondary schools. Factors which aid in promoting academic achievement would be considered desirable attributes of a good educational program. There are certain factors of high school background which possibly contribute to a higher level of academic achievement while other factors may have little or no influence. It is therefore pertinent to try to ascertain the factors or conditions that seem to contribute to better academic achievement in our secondary schools.

¹ Hollis L. Caswell and others, The American High School. New York: Harper & Bros., 1946, pp. 5-6.

The Problem

Most schools today offer a fairly complete program of English, mathematics, social science, and science. A good educational program will include a pattern of such courses. That the University of Nebraska attaches much importance to a program of this nature is indicated by the fact that the pre-registration guidance examinations, used as a basis for classification of students and placement in classes at the University, measure achievement in English, mathematics, social science, and science.

The problem of this study is to gather and present evidence on the relationship between certain quantitative factors in the high school background of students, which are commonly associated with a good educational program, and achievement in English, mathematics, social science, and science. This investigation will seek answers to the following subsidiary questions.

1. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the size of the school they attended?
2. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the scholastic aptitude of these students?
3. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the amount of teaching experience of the student's teachers?

4. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the salaries paid to the student's teachers?

5. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and teacher preparation in the specific subject-matter areas?

6. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the number of credits students earned in specific subject-matter areas? ✓

7. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the number of graduate hours earned by the student's teachers?

8. What relationship exists between the achievement of high school graduates who enter the University of Nebraska and the distance the students travel to attend the University?

Purpose of the Study

This study should provide educators, legislators, school patrons, tax-payers, and the public in general with needed information as to how they can get better schools and better educated youth. It is hoped that the data presented will assist them in the evaluation of schools and school practices.

Limitations of the Study

This study is limited in the following ways:

- 1. The total school program is not evaluated in this study since information on many aspects of a good educational program is not presented.**
- 2. This study provides answers only in terms of knowledge of subject matter of college-bound students as revealed by examinations in the four areas of English, mathematics, social science, and science.**
- 3. This study gives no consideration to high school graduates who did not go to college.**
- 4. Only graduates of Nebraska public high schools who attended the same high school for at least three years prior to graduation and graduated in 1947 are included in the study.**
- 5. It is realized that elementary school background is probably very important in its contribution to high school achievement but this study is limited to the consideration of three years of high school background.**

Plan of the Study

This study was made at the University of Nebraska. The population consisted of freshmen who graduated from Nebraska public high schools in May or June, 1947, and who took the University of Nebraska pre-registration guidance examinations prior to entering the University the following fall. Veterans were excluded from the study since it was felt that their army

experience might affect the data materially. Transfer students were excluded as well as students who graduated from high school in previous years. Also, the population was limited to freshmen who attended at least the last three years in the high school from which they graduated. On the basis of these criteria, 836 freshmen from the group entering the University in the fall of 1947 were included in the study.

Sources and Treatment of Data

Most of the background data used in the comparisons were taken from three sources: the records of the Bureau of Instructional Research, University of Nebraska; the records of the Junior Division, University of Nebraska; and the joint reports of Nebraska high schools to the University of Nebraska and the State Department of Public Instruction.

An initial list of approximately 1400 students who entered the University of Nebraska in the fall of 1947 was prepared by the Bureau of Instructional Research. The list included the names of the students, the schools from which they graduated, and scale scores designating achievement in English, mathematics, science, social science, and scholastic aptitude. The records of the Junior Division provided a check of the schools from which the students graduated, the raw scores of the various tests, and the number of units of work earned in each subject.

The joint reports of Nebraska high schools to the University

of Nebraska and the State Department of Public Instruction provided the following data:

1. The names of the teachers who taught English, mathematics, science, and social science in Nebraska high schools included in the study, during the years 1944-1947,
2. the subjects taught by each of these teachers,
3. the salaries of each of these teachers,
4. the teaching experience of each of these teachers,
5. the number of graduate hours earned by each of these teachers,
6. the teacher's college preparation in the subjects taught.

In taking data from the Junior Division records, the following rules were observed.

1. No 9th grade English units were recorded.
2. All 10th, 11th and 12th grade English units, including Dramatics and Journalism were recorded.
3. All Mathematics units, including 9th grade General Mathematics, 9th grade Geometry, and 9th grade Algebra, were recorded.
4. No General Science Units were recorded. Biology units were recorded even when earned in the 9th grade.
5. Geography units were recorded as Social Studies rather than Science units.
6. Physiology units were recorded if accepted by the University of Nebraska as Science units.
7. Hygiene units were not recorded since the University of Nebraska rejected them as Science units.
8. In Social Studies, World Geography and World History units were recorded whether taken in 9th or 10th grades.
9. Ninth grade Civics, Orientation, Guidance, and Freshmen Social Studies units were not recorded.
10. Geography of Nebraska units were not recorded.

In taking data from the joint reports the following rules were observed:

1. Reports for the years 1944, 1945, and 1946 were used.
2. The present years experience was included in the total experience of the teacher.
3. Philosophy and Bible hours were not included in Social Science preparation.

The scores used to denote achievement were secured from the results of the University of Nebraska pre-registration guidance examination. Results from four specific tests were used: (1) the Nebraska English Classification Examination, Form XII, a test of English usage; (2) Social Studies, the American Council on Education Cooperative General Culture test, a test measuring the individual's range of information in the areas of current events, political science, history, and other social sciences; (3) Natural Science, test XII of the United States Armed Forces Institute tests of General Educational Development, High School level (Form B); and (4) the Nebraska Mathematics Classification Examination, (1945 A) an index of the student's skill in basic arithmetic and general mathematics.

Scholastic aptitude scores of each student were also taken from the results of the University of Nebraska pre-registration guidance examinations. Two scores were used: (1) L, a score based on the "linguistic" test in the American Council on Education Psychological Examination, 1942 Edition; and (2) T, a score based on both the "linguistic" and the "quantitative" tests in the American Council on Education Psychological Examination, 1942 Edition.

At the outset of the study, English was used as an area to

explore possible relationships and to test procedures of statistical analysis. In all, seven statistical procedures were used. These were analysis of variance, the chi-square test, the t test for significance of the difference between means, Pearson's product moment correlation, correlations determined from Flanagan's tables, partial correlation, and the t test of significance for correlation coefficients. Analysis of the data using these procedures is found in Chapter II.

It will be observed in Chapter II that the statistical procedures, analysis of variance, the t test of significance of the difference between means, and correlations determined from Flanagan's tables do not contribute anything to the study that the other techniques have not already done and in the case of the t test, the data was not readily adaptable to the use of this technique. For these reasons, it was decided to limit the statistical procedures used in the analysis of social studies, mathematics, and science data to the remaining four, the chi-square test, Pearson's product moment correlation, partial correlation, and the t test of significance for correlation coefficients. Analysis of data using these procedures is found in Chapter III.

Related Studies

There are so many factors that have an influence on achievement that it seems hazardous to try to indicate which

one or combination of factors may be responsible for the success or failure of students in high school subjects. However, many studies have been done in the past relating first one thing and then another to success in such subjects as English, mathematics, science and social science and a great variation has been observed in the relationships found. Some of these studies are here reviewed.

In a survey of the achievement in Arithmetic of 11,348 sixth grade pupils in 468 schools in Indiana, Eaton found great individual differences and wide differences in average achievement between groups; high achievement associated with younger pupils and low achievement associated with older pupils; no superiority in achievement in schools having longer terms; and no marked differences were observed in achievement in relation to the time given daily or weekly to the study of arithmetic. In addition, no relationship was found between the number of rooms in an elementary school and pupil achievement in arithmetic in the 6B, but in the 6A there was a slight tendency for those in smaller schools to make higher scores on the tests.²

In another survey of the achievement in social studies of sixth grade pupils in Indiana, Eaton found great individual differences and wide differences in the average achievement between groups; high achievement was associated with younger

² Merrill T. Eaton, "A Survey of the Achievement in Arithmetic of 11,348 Sixth Grade Pupils of 468 Schools in Indiana," School of Education Bulletin, Indiana University, 20:5-62, (March, 1944)

pupils and low achievement with older pupils; no superiority was shown in achievement in schools with longer terms; and no marked differences were observed in relation to the time given daily or weekly to the study of social studies. In addition, no definite relationship was found between the number of classrooms in the elementary school and pupil achievement in social studies. Neither size of school nor size of class seem to have been a factor in modifying achievement, although in the 6A the larger classes tended to make slightly higher average equated scores than the smaller ones.³

In another survey of factors related to language arts achievement of sixth grade pupils, the same investigator found "in most cases the findings of the analysis-- --in agreement with the thoughts and practices of leading school administrators. There is ample evidence-- --that, at least four years of teacher training is desirable; -- --that pupils tend to achieve higher in the larger elementary schools. Perhaps, the most surprising conclusions are that pupils under beginning teachers achieve as high or higher in the language arts than do pupils under teachers with many years of experience and that neither high nor low achievement seem to be closely related to the time given daily to language, reading, and spelling."⁴

³ Merrill T. Eaton, "A Survey of the Achievement in Social Studies of 10,220 Sixth Grade Pupils of 464 Schools in Indiana," School of Education Bulletin, Indiana University, 20:63. (May 1944)

⁴ Merrill T. Eaton, An Analysis of Factors Related to the Language Arts Achievement of Sixth Grade Pupils. Research Bulletin #8, Department of Public Education, State of Indiana, 1944.

Bond, in a study of reading ability and ninth grade achievement drew the following conclusions:

1. Varying degrees of relationship exist between the several aspects of ability in reading and composite ninth grade achievement.
2. Varying degrees of relationship exist between the several aspects of reading and each of the various ninth grade subjects.
3. The importance of ability in the various aspects of reading to achievement in English is quite apparent; the greater the achievement in various reading abilities, the greater will be the achievement in English.
4. Reading efficiency is related to achievement in algebra and general mathematics.
5. Importance of ability in various aspects of reading comprehension for achievement in ninth grade general science is demonstrated.⁵

In a study by Jaynes, little relationship was found between specific observable teacher acts and pupil gain criteria.⁶ Gerberich found that:

"at least two factors contributing to the low scholarship of high aptitude students are study techniques and

⁵ Eva Bond, Reading and Ninth Grade Achievement. New York: Bureau of Publications, Teachers College, Columbia University, 1938.

⁶ C. D. Jaynes, "Study of Relationship between Teaching Procedures and Educational Outcomes," Journal of Experimental Education, 14:101-34 (Dec. 1945).

time expenditure not most conducive to the attainment of high course marks and at least a partial examination of the high marks made by low aptitude students lies in careful study methods, attention to the demands made by instructors, and elimination of extra-class activities from their schedules."⁷

Numerous studies have reported correlations between achievement and intelligence. Byrns and Hannon correlated the scores on the National Intelligence test, given to grades IV to VIII in 1920, with the average achievement of the same pupils at various school levels. These correlations ranged from .37 to .45.⁸ Hartson and Sprov found correlations of .40 to .54 between scholastic achievement and intelligence test scores. These authors point to motivation, determination, and drive as possible factors related to school achievement.⁹ Woody reports that pupils indicate interest as the determining factor for higher marks on one subject than another. He reports correlations from .34 to .89 between expressed interest and achievement in the various subjects but found little relationship between interest and mental ability.¹⁰

⁷ J. R. Gerberich, "Factors Related to the College Achievement of high aptitude students who fail of expectations and low aptitude students who exceed expectations," Journal of Educational Psychology, 32:262, (April, 1941).

⁸ R. Byrns and V. A. C. Hannon, "Long Range Prediction of College Achievement," School and Society, 41:877-880, (June, 1935).

⁹ L. D. Hartson and A. J. Sprov, "The Value of Intelligence Quotients obtained in Secondary Schools for predicting college scholarship," Educational and Psychological Measurement, October, 1941, pp. 387-398.

¹⁰ Clifford Woody, Aptitudes, Achievements and Interests of High School Pupils, Bureau of Educational Reference and Research, School of Education, University of Michigan. Bulletin # 157, (November, 1945).