1958

A Study of the Relationship of Socio-Economic Status to School Achievement and Intelligence

Floyd L. Ellingson Jr.
Central Washington University

A STUDY OF THE RELATIONSHIP OF SOCIO-ECONOMIC STATUS TO SCHOOL ACHIEVEMENT AND INTELLIGENCE

A Thesis

Presented to

the Graduate Faculty

Central Washington College of Education

In Partial Fulfillment

of the Requirements for the Degree

Master of Education

---

by

Floyd L. Ellingson, Jr.

August 1958

APPROVED FOR THE GRADUATE FACULTY

_____

George C. Fetter, COMMITTEE CHAIRMAN

_____

Merle Meyer

_____

Melvin A. Angell

ACKNOWLEDGMENTS

Grateful acknowledgment is extended to Dr. George C. Fetter for his advice in directing the development of this paper, to Dr. Melvin A. Angell, and to Mr. Merle Meyer for their very helpful recommendations.

Further acknowledgment is extended to Dr. Eldon E. Jacobsen for his aid in the initial planning of this paper.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

For many years, studies have shown a fairly high correlation between intelligence test scores and school achievement. Schoolmen have tended to use intelligence test scores as one of the chief indicators of an individual's probable achievement in a school situation. The fact that so much emphasis has been placed upon a single variable is ample reason to investigate other relationships to achievement.

I. THE PROBLEM

Statement of the problem. It was the purpose of this study (1) to examine the relationship between socio-economic status and intelligence, of eighth grade students in the same school system, and their achievement in certain school subjects; (2) to show the relationship of a selected instrument for the measurement of socio-economic status to school achievement and intelligence; and (3) to present the significance of these findings and their application in a school situation.

Importance of the study. The use of intelligence test scores as one of the criteria for indicating probable school achievement has long been accepted and relied upon

by most educators. For obvious reasons it is a very useful and economical means of assessing a student's general ability to do school work. This is especially true of the group type intelligence test.

However, the possibility existed that there may be another variable that would show a significant relationship with school achievement; i.e., socio-economic status.

Since as early as 1910, studies have been made concerning the relationship of socio-economic status with school achievement.[1] These studies all tend to show a positive correlation with school achievement. One of the difficulties encountered in developing these studies was that of assessing an individual's socio-economic status. Most instruments, it seems, have been too time consuming and subjective, on the part of the interviewer, and an inconvenience to the parents of the school child.

In this study, an attempt was made to eliminate these weaknesses by use of a fairly new instrument; Gough's Home Index scale, for assessing socio-economic status. The use of this newer instrument eliminates much of the time formerly needed with other instruments and confines the contact to the school child. The reliability and

---

[1]Owen J. Neighbours, "Retardation in the Schools and Some of the Causes," Elementary School Teacher, 11:119-135, November, 1910.

validity of the instrument is reported to be comparable with that of previous instruments.[2]

II. DEFINITIONS OF TERMS USED

Socio-economic status. For the purpose of this study, Gough's own definition or conception of socio-economic status will be used. He conceives of socio-economic status " . . . as a prestige variable dependent on social and economic factors, which are not configurated in any constant manner."[3] The items employed by Gough in his index appear to measure the factors associated with socio-economic status, as he conceives it. Thus, it seemed appropriate to use his definition in this study.

School achievement. For the purpose of this study, school achievement is considered to be the grade point average of a student, based on the grades he received in a classroom situation. Certain school subjects were selected which were considered to be common in most schools. The grade point average (GPA) was computed from grades earned in the second semester of the seventh grade and the first semester of the eighth grade.

---

[2]Harrison G. Gough, "A Short Status Inventory," Journal of Educational Psychology, 40:52-56, January, 1949.

[3]Harrison G. Gough, "The Relationship of Socio-economic Status to Personality Inventory and Achievement Test Scores," Journal of Educational Psychology, 37:528, December, 1946.

Intelligence. For the purpose of this study, intelligence is considered to be the intelligence deviation score as derived on the Terman-McNemar Test of Mental Ability, Form C. Operationally defined, it is the general ability of a pupil to do school work.

In summary, the general purpose of this study was to examine the relationship of socio-economic status to school achievement and intelligence as they were defined in this chapter. The following chapter has been devoted to a discussion of similar and related research studies.

CHAPTER II

REVIEW OF LITERATURE ON SIMILAR STUDIES

A number of investigations have been conducted concerning the relationship of socio-economic status to school achievement and intelligence test scores. However, only a few studies stand out as being especially significant and related to this investigation. A brief summary of these studies follows.

In 1929, Chauncey studied a group of 113 eighth grade and 130 ninth grade pupils in an effort to measure the relation of the home factor to achievement and intelligence test scores. He determined socio-economic status through the use of scores made on the Sims Score Cards for Socio-economic Status. Achievement was based on scores earned on the Stanford Achievement Test, while intelligence was based on McCall Multimental Scale scores. He found a correlation of .30 (eighth grade) and .35 (ninth grade) between socio-economic status and achievement and a correlation of .21 and .19 respectively between socio-economic status and intelligence. When the intelligence test scores were partialed out, the correlation coefficient was .23 and .30 respectively.[1]

---

[1] M. R. Chauncey, "The Relation of the Home Factor to Achievement and Intelligence Test Scores," Journal of Educational Research, 20:88-90, September, 1929.

Stroud[2] reviews some of the investigations previously reported in this area and also presents some additional findings of his own. In his conclusion, concerning his own findings, he states that " . . . the relation between socio-economic status of pupils and their achievement is about the same degree as that between socio-economic status of pupils and their test intelligence."[3]

Because Stroud's own review of similar research studies was so comprehensive, it seemed appropriate to cite some of his work in this review. The following few paragraphs were reviewed in part from his article,[4] and will be in reference to Table I, which was of his own compilation.[5]

Counts[6] and Holley,[7] in separate but similar studies,

---

[2]J. B. Stroud, "Predictive Value of Obtained Intelligence Quotients of Groups Favored and Unfavored in Socio-economic Status," Elementary School Journal, 43:97-104, October, 1942.

[3]Ibid., p. 101.

[4]Ibid., pp. 97-108.

[5]Ibid., p. 98.

[6]George S. Counts, The Selective Character of American Secondary Education, Supplementary Educational Monographs, No. 19 (Chicago: Department of Education, University of Chicago, 1922). Cited by Ibid., p. 97.

[7]Charles E. Holley, The Relationship Between Persistence in School and Home Conditions, Fifteenth Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1916). Cited by Ibid., p. 97.

TABLE I

SUMMARY OF TWELVE STUDIES GIVING CONSIDERATION TO RELATION OF SOCIO-ECONOMIC STATUS TO INTELLECTUAL CAPACITY AND EDUCATIONAL ACHIEVEMENT

Investigator	Date of Report	Subject of Study	Pupils Included	Correlation Shown
Counts	1922	Relation of father's occupation to children's educational opportunities	17,992 pupils in four cities	Close relation
Holley	1916	Persistency in school and "family index"	Pupils in several cities in Illinois	Close relation
Garrison	1932	"Socio-cultural" status of home and Sangren Information Tests for Young Children	103 pupils in Grade I	.425
Neighbours	1910	Home background and retardation in school	500 pupils in Grades I-VIII	Highest percentage of retardation among pupils from lowest ranking homes
Engle	1934	Socio-economic status and school marks	354 high-school pupils	More high marks in privileged group; more low marks in underprivileged group

TABLE I (CONTINUED)

Investigator	Date of Report	Subject of Study	Pupils Included	Correlation Shown
Lancastor	1937	Socio-economic status and general-science information	Preschool children	Definite differentiation among children from various socio-economic backgrounds
Smith	1940	Socio-economic status and information about social geography	Preschool children	Smith's subjects, drawn from the two lowest occupational groups, made lower scores than Williams' subjects, drawn from more favored group--The same tests were used
Williams	1939	Socio-economic status and information about social geography	Preschool children	
Probst	1931	Socio-economic status and general information	100 pupils in second half-year of kindergarten	Marked difference in range of information between upper and lower halves of the socio-economic groups

TABLE I (CONTINUED)

Investigator	Date of Report	Subject of Study	Pupils Included	Correlation Shown
Hilliard and Troxell	1937	Relation of home background to general information, vocabulary, reading readiness, and reading recall	Two groups of kindergarten children followed through Grade II	Rich-background group exceeded meager background group by: 1 year, 9 months in median age score on general information; 7 months in median age score on vocabulary; 12.1 points in score on reading readiness test; 6 months in score on reading progress
Bryan	1941	Rating on Sims Score Card, intelligence quotient on Otis Self-Administering Tests of Mental Ability, average school marks, and scores on Metropolitan Achievement Test	169 intermediate-grade pupils	Sims score and: school marks--.56; Otis I.Q.--.49; school marks with I.Q. held constant--.35. Otis I.Q. and school marks --.68. Otis M.A. and Metropolitan scores--.70
Shaw	1941	Rating on Sims Score Card, average school marks, intelligence quotient on Otis Self-Administering Tests of Mental Ability, and scores on Stanford Achievement Test	Pupils in Grades IV-VIII	Sims score and: school marks--.38; Otis I.Q.--.31; E.Q.--.41; E.Q. with I.Q. held constant--.27. Quotient of grade norm divided by grade placement--.37. Otis I.Q. and E.Q.--.80

obtained results that were comparable. Counts' study indicated a close relation of the father's occupation to the children's educational opportunities; Holley's study indicated a close relation of persistency in school and "family index." Also mentioned by Stroud was Garrison's study[8] of 103 first-grade pupils, in which a correlation of .425 was obtained between"socio-cultural" status of the home, and scores on the Sangren Information Tests for Young Children.

In a study of home background and retardation in school, Neighbours[9] found the highest percentage of retardation among pupils coming from the lowest ranking homes and the lowest percentage among pupils coming from the highest ranking homes. Engle's study[10] was concerned with the relation of socio-economic status and school marks. The academic achievement of 354 high school pupils, based on letter marks, was compared with their socio-economic status. The results of the study indicated more high marks were

---

[8]K. C. Garrison, "The Relative Influence of Intelligence and Socio-cultural Status upon the Information Possessed by First Grade Children," Journal of Social Psychology, 3:590-598, August, 1932. Cited by Ibid., p. 97.

[9]Owen J. Neighbours, "Retardation in the Schools and Some of the Causes," Elementary School Teacher, 11:119-135, November, 1910. Cited by Ibid., p. 97.

[10]T. L. Engle, "Home Environments and School Records," School Review, 42:590-598, October, 1934. Cited by Ibid., p. 97.

received by pupils in the privileged or high socio-economic group and more low marks by pupils in the underprivileged or low socio-economic groups.

Stroud makes reference to a number of investigations concerning the relation between the socio-economic status of preschool and kindergarten children and their fund of knowledge. These are: Lancaster's study,[11] dealing with information about general science, Smith's study[12], and also William's,[13] dealing with information about geography, and Probst's,[14] dealing with general information.

An investigation by Hilliard and Troxell[15] studied the progress of two groups of kindergarten children,

---

[11]Elizabeth Lancaster, "An Information Test for Children of Preschool age: II. General Science," (unpublished Master's thesis, University of Iowa, 1937). Cited by Ibid., p. 97.

[12]Janet Smith, "Performance of Preschool Children of Low Socio-economic Status on Information Test III: Social Geography," (unpublished Master's thesis, University of Iowa, 1940). Cited by Ibid., p. 97.

[13]Helen C. Williams, "An Information Test for Children of Preschool Age: III. Social Geography," (unpublished Master's thesis, University of Iowa, 1939). Cited by Ibid., p. 97.

[14]Cathryn A. Probst, "A General Information Test for Kindergarten Children," Child Development, 2:81-95, June, 1931. Cited by Ibid., p. 97.

[15]George H. Hilliard, and Eleanor Troxell, "Informational Background as a Factor in Reading Readiness and Reading Progress," Elementary School Journal, 38:255-263, December, 1937. Cited by Ibid., p. 99.

selected on the basis of home background, from the kindergarten on through the fourth month of the second grade. Both groups of children tested average or better in intelligence. In initial performance on the Sangren Information Tests for Young Children and on the Smith Vacabulary Test, the group coming from the rich home background surpassed, by a comfortable margin, the group coming from a meager background. During the period of study, important differences were observed between the two groups in reading readiness and in progress in reading.

Stroud's table and discussion showed clearly the results of Bryan's study[16] of 169 intermediate-grade pupils selected from a single elementary school. She studied the relation between educational achievement and ratings on the Sims Score Card for Socio-economic Status. The correlations shown may be excessively high due to the fact that the school is so situated as to draw pupils from two distinctly separate socio-economic groups. The results of a similar study, conducted by Shaw,[17] under the direction

---

[16]Ruth Bryan, "A Study of the Relationship between Socio-economic Status and School Achievement," (unpublished Master's thesis, University of Iowa, 1941). Cited by Ibid., p. 99.

[17]D. C. Shaw, "A Study of the Relationships between Socio-economic Status and Pupil Achievement in Grades Four to Eight," (unpublished Master's thesis, University of Iowa, 1941). Cited by Ibid., p. 99.

of Stroud, are plainly shown in Table I, page 9. Shaw studied 280 pupils in grades four to eight of the schools of Sheldon, Iowa. He appears to have made a thorough investigation of the relation between the various measures used as the criteria for determining socio-economic status, intelligence, and achievement.

Especially significant are studies made by Gough, the author of the instrument used to determine socio-economic status in the present investigation. Gough found some interesting correlations in a study he conducted, which was mainly concerned with personality, achievement and intelligence. He used the American Home Scale as the criterion for socio-economic status and the Stanford Achievement Test as the criterion for achievement. He found that correlations between these two variables tend to cluster near .30. He used Haggerty Delta II Intelligence Test scores as the criterion for intellectual capacity, and found these correlated .30 with socio-economic status.[18]

In a more recent study, Gough used a sample of 231 high school seniors. Between the Otis I.Q. and Sims Score Cards, a correlation of .33 was found. Between honor point ratio and Sims Score Cards a correlation of .25

---

[18]Harrison G. Gough, "The Relationship of Socio-economic Status to Personality Inventory and Achievement Test Scores," Journal of Educational Psychology, 37:528, December, 1946.

was revealed.[19]

In concluding this review of literature, only those studies considered relevant to this investigation were discussed. It is possible that some pertinent studies may have been unintentionally omitted. However, the studies reviewed may be considered as a representative sample of related investigations.

---

[19]Harrison G. Gough, "Factors Relating to the Academic Achievement of High-School Students," Journal of Educational Psychology, 40:74, February, 1949.

CHAPTER III

MATERIALS AND PROCEDURE

The general purpose of this study was to examine the relationship of socio-economic status to school achievement and intelligence test scores, and relate these findings to a school situation. In order to accomplish this, it was necessary to select a representative sample and choose suitable criteria for establishing the variables involved. Also, the method of approach had to be considered. This chapter will be devoted to a discussion of these factors as they were related to this study.

I. MATERIALS

Study group. The study group was composed of 225 eighth grade pupils from the two junior high schools in School District Number Five, Aberdeen, Washington. The study group was considered to be representative, having a standard deviation of 16.4 (N = 225) compared to a standard deviation of 16 (N = ∞) on the Terman-McNemar Test of Mental Ability, Form C.

Criterion for socio-economic status. Raw scores earned on Gough's Home Index scale[1] were used as the

---

[1] A sample of the Home Index scale is presented in Appendix A of this paper.

criterion for socio-economic status. This scale was chosen because it represented a simple, economical, and reliable means of assessing a pupils socio-economic status. The Home Index, as discussed by its author, is based largely upon a re-analysis and re-working of items in the Sims Score Cards for Socio-economic Status and the American Home Scale, with the addition of certain original items.[2] A score is obtained from the Home Index as follows:

> . . . by counting the number of 'Yes' responses on the first twenty questions, and then adding extra points according to the following scheme for item 21: no points for having zero through ninety-nine books; one point for having one hundred through four hundred ninety-nine books; and two points for having five hundred or more books. The total range of scores is thus from zero through twenty-two.[3]

The reliability of the scale is suggested by a test-retest correlation of .989 on a sample of fifty-five college psychology laboratory students. A coefficient of .74, calculated by the Kuder-Richardson method, was obtained on a sample of 252 high school students. This represents a minimum estimate of the internal consistency of the scale. Gough also found the following correlations of the Home Index with these variables: .88, American Home Scale; .82, Sims Score Cards; and .65, Father's Occupation. Since the above variables could be considered as commonly used

---

[2]Harrison G. Gough, "A Short Status Inventory," Journal of Educational Psychology, 40:53, January, 1949.

[3]Ibid., p. 54.

indices of socio-economic status, they could also serve as validating criteria for the Home Index scale. It was interesting to note that the correlation found by Gough between the American Home Scale and Sims Score Cards was .77, which meant that the Home Index correlated higher with both of these instruments than they did with each other.[4]

In considering the above information, it seemed that the Home Index would be a desirable instrument to use in this study.

Criterion for school achievement. The actual grade point average (GPA) earned, by each student in the sample, was finally chosen as being most representative of school achievement. In order to justify this decision, a correlation was obtained between the Stanford Achievement Test, Form JM (average grade placement scores) and the GPA. This correlation equaled .884, which was significant at the one per cent level of confidence,[5] and would tend to indicate a very close relationship between the two variables. Additional correlations were obtained between the Terman-McNemar Test and the GPA, and the Terman-McNemar Test and the Stanford Achievement Test. The correlations found were

---

[4] Ibid., p. 54.

[5] J. P. Guilford, Fundamental Statistics in Psychology and Education (second edition: New York: McGraw-Hill Book Company, Inc., 1942), pp. 208-212.

.723 and .848 respectively. Although the Stanford Achievement correlated higher with test intelligence than did the GPA, both correlations were significant at the one per cent level of confidence. There were several reasons why it seemed justifiable to use the GPA as the criterion for school achievement. First, the correlation between the standardized measure of achievement and actual grades received in a classroom situation was found to be significant at the one per cent level, which indicated a very close relationship between the two. Second, even though there was a higher correlation between the Stanford Achievement Test and the Terman-McNemar Test of Mental Ability, the correlation of the GPA to the latter was high enough to be very significant. Third, since the GPA was computed from grades earned in a classroom situation, within a specific school system, it seemed a better measure of school achievement for this investigation.

In order to arrive at a grade point average, it was necessary to select certain subjects which were thought to be common in most schools and representative of achievement on the part of the individual. The following subjects were chosen on that basis: English, mathematics, reading, and social studies. The grade point average was then computed on the basis of grades earned in these subjects in the second semester of the seventh grade and the first semester

of the eighth grade, with the exception of reading. The reading grade was available for the seventh grade only, and was used on that basis. The method of grading in this particular school system was as follows: Excellent, Good, Average, Fair, Poor, and Fail. This necessitated conversion to numerical values, which were as follows: Excellent = 5, Good = 4, Average = 3, Fair = 2, Poor = 1, and Fail = 0. After this had been accomplished, the grade point average was then computed, using the converted values.

This, then, constituted the criterion for determining school achievement.

Criterion for Intelligence. The instrument used to determine a pupils intelligence was the Terman-McNemar Test of Mental Ability, Form C. Designed primarily for grades 7 through 12, it is considered to be among the most widely used and carefully constructed of such tests for this level.[6] A considered authority on testing, Anastasi, discusses the test as follows:

> . . . It is predominantly a measure of verbal comprehension, consisting of the following seven subtests: Information, Synonyms, Logical Selection, Classification, Analogies, Opposites, and Best Answer. Two numerical tests which had been included in the earlier form were eliminated from the revised form in order to make the test more homogeneous and the scores less ambiguous. . . .

---

[6]Anne Anastasi, Psychological Testing (New York: The Macmillan Company, 1954), p. 216.

> The Terman-McNemar Test has been prepared in two equivalent forms, C and D, . . . Each form requires approximately fifty minutes to administer and is described in the manual as being essentially a power test, the time limits allowed for each subtest being adequate to enable most subjects to attain their maximum score. Norms were established through a carefully conducted, nation-wide testing program, involving 200 communities in 37 states. Scores can be expressed in terms of percentiles, mental ages, and deviation IQ's with an SD of 16 points. . . . The last type of score is, of course, the soundest of the three measures and is to be preferred for most purposes.
>
> The reliability coefficient of the total test, adjusted for a single age level, was found to be .96 by both split-half and parallel-form techniques. A correlation of .91 is reported between the present test and the earlier Terman Group Test. Individual scores on the two tests are not, however, directly comparable, because of differences in test content, standardization sample, and method of computing IQ. For this reason, conversion tables for finding corresponding scores in the two tests are provided in the manual. The principal evidence for validity derives from the item analysis, which was conducted on a total of 1200 pupils in grades 7, 9, and 11. One criterion for item selection was grade differentiation, or increase in percentage of subjects passing an item from grade 7 to 9, and from grade 9 to 11. The other criterion was the correlation between each item and total score on the entire test. . . .[7]

In view of the apparent validity of this instrument and the accessibility of test scores, the Terman-McNemar Test of Mental Ability seemed an appropriate measure of intelligence for this investigation.

II. PROCEDURE

Method of collecting data. The necessary data was

---

[7] Ibid., pp. 216-217.

collected by the investigator from each pupil's permanent record. This data consisted of the pupil's name; age; Terman-McNemar Test score and date of latest administration; Stanford Achievement Test grade placement score and date of latest administration; and grades in English, mathematics, reading, and social studies, for the second semester of the seventh grade and first semester of the eighth grade. The exception being the reading grade, which was available for the second semester of the seventh grade only, and was used on that basis.

A number was assigned to each pupil for the purpose of identifying his copy of the Home Index, which he was asked not to sign.

The Home Index scale was first given to a pilot group (N = 19) in an effort to establish a test-retest correlation. Six weeks after the first administration of the Home Index to the pilot group a second administration was conducted. A correlation of .79 was obtained between the first sitting and the second. Although this was significant at the one per cent level of confidence, it may have been higher had one pupil not changed her responses radically in the second sitting.

After it had been established that the Home Index would be a reliable measure, it was administered to the entire sample group by the respective homeroom teachers,

who had been given an explanation of the study, and instructions for administering the scale. The responses were then scored by the investigator and recorded along with the other pertinent data.

Method of correlating data. After the essential data concerning scores on the various measures had been collected, zero order correlations were then computed. The Pearson Product Moment technique was used in computing these correlations in an effort to establish the relationships existing between socio-economic status, school achievement, and intelligence. A multiple correlation was also computed, using socio-economic status and intelligence as the pooled independent variables and school achievement as the dependent variable. This was done to explore the possibilities of predicting achievement.

All correlations were computed by machine. The obtained relationships are discussed in the following chapter concerning the results and implications of this investigation.

CHAPTER IV

RESULTS AND IMPLICATIONS

The purpose of this study was to investigate the degree of relationship existing between socio-economic status, school achievement, and intelligence; and to try and relate these findings to a school situation. The Pearson Product Moment technique was used to find the correlations among these variables. Also, a multiple correlation was computed in an effort to determine the effect of socio-economic status and intelligence with school achievement.

I. RESULTS

Inter-relationships between variables. Table II shows the inter-correlations obtained among the various measures considered for this study. The table clearly indicates that all of the correlations are of a positive nature. Even though some of the correlations may be considered qualitatively[1] as being low, they are all, nevertheless, significant at the one per cent level of confidence.

The Home Index correlated .446 with GPA; this would suggest that a low, but very significant relationship exists

---

[1]Allen L. Edwards, Statistical Analysis (New York: Rinehart and Company, Inc., 1946), p. 100.

TABLE II

INTER-CORRELATIONS AMONG THE MEASURES CONSIDERED FOR THIS STUDY

MEASURES	1	2	3	4
1. Home Index scores		.446	.573	.332
2. Grade Point Average			.884	.723
3. Stanford Achievement scores				.848
4. Terman-McNemar scores				

between the two. The correlation of .573 obtained between the Home Index and the Stanford Achievement suggests a closer relationship, but is still somewhat low. The correlation of .332 existing between Home Index and the Terman-McNemar Test may be considered as being very low, but again, there is evidence of a positive and significant relationship between the two.

The remaining correlations shown in Table II, page 24, are in a sense cross validations of similar earlier research findings. For example, Shaw's study, as reviewed in Table I, page 9, showed a correlation of .80 between the Otis I.Q. and the Stanford Achievement Test. This is similar to the correlation of .848 obtained in this study between the Terman-McNemar Test and the Stanford Achievement Test. Another example is Bryan's study, shown in the same table, in which a correlation of .68 was obtained between the Otis I.Q. and school marks. This is very near the correlation of .723 obtained in this study between the Terman-McNemar Test and GPA. These comparisons between studies, with regard to obtained correlations, are not completely comparable and are subject to certain statistical considerations since different measures were used in the separate studies.

Table III shows the inter-correlations among the variables used in this study. It can be seen from the table

TABLE III

INTER-CORRELATIONS AMONG THE VARIABLES

CONSIDERED IN THIS STUDY

VARIABLES	1	2	3	4
1. Socio-economic Status		.332	.446	
2. Intelligence			.723	
3. School Achievement				.755
4. Socio-economic Status and Intelligence				

that all of the relationships are of a positive nature. The correlation of .332 obtained between socio-economic status and intelligence is definitely low. The correlation of .446 between socio-economic status and school achievement is also low. A moderate correlation of .723 was obtained between school achievement and intelligence. All of these correlations are significant at the one per cent level of confidence.

The last correlation shown in Table III, page 26, is a multiple correlation. In computing this correlation, the two independent variables (socio-economic status and intelligence) were pooled in an effort to determine their relationship with school achievement. As shown in the table, a correlation of .755 was obtained. In one respect, this may be considered significant since no correlation would be equal to zero. However, the difference[2] between the relationship of intelligence alone with school achievement ($r = .723$) and intelligence with the addition of socio-economic status with school achievement ($R = .755$)[3] is not significant at the five per cent level of confidence. This suggests that the addition of socio-economic status to intelligence has little effect on the prediction of school

---

[2]Henry E. Garrett, Statistics in Psychology and Education (fourth edition; New York: Longmans, Green and Company, 1953), pp. 238-239.

[3]R is the symbol for multiple correlation.

achievement.

The implications of these findings will be discussed in the remaining section of this chapter.

II. IMPLICATIONS

It may be seen by reference to Chapter II of this paper, and specifically Table I, pages 7 to 9, that the findings of this study are in general agreement with earlier investigations. This study differed, however, from earlier investigations in that a new type of instrument, the Home Index, was used to establish socio-economic status. This instrument was very easy to use and appears to be quite reliable. The empirical validity of the instrument is suggested by similar correlations obtained in earlier research with the use of other techniques for assessing socio-economic status. The value of the Home Index scale seems to lie mainly in its apparent reliability, validity, and ease of administration to large groups. For measuring socio-economic status, it appears that the Home Index is a very usable and desirable instrument.

With respect to this investigation, the findings suggest that socio-economic status has little real value in a school situation. Even though socio-economic status appears to be positively related to school achievement ($r = .446$) and intelligence ($r = .332$), the relationship

does not seem of such a magnitude to warrant much practical value in a school situation. However, the findings suggest that, in general, pupils of lower socio-economic status tend to have lower test intelligence and lower grade point averages; and that pupils of higher socio-economic status tend to have higher test intelligence and higher grade point averages. The correlation of .723 between intelligence and school achievement is of sufficient magnitude to confirm its usefulness as an indicator of school achievement.

The results of this investigation suggest that other variables probably should be considered in further research studies concerning indicators of school achievement, since socio-economic status apparently holds little real value in this respect. In regard to additional research, multiple regression techniques, using other variables, might prove to be of value in predicting individual school achievement.

It has been suggested[4] that socio-economic status may, when correlated with an intellectual variable, yield a correlation which is nonlinear. If this should be the case, the correlations obtained in this study could, in effect, be an underestimate of the true relationships existing between the variables considered. In order to

---

[4]Kenneth Eells, et al., Intelligence and Cultural Differences (Chicago: University of Chicago Press, 1951), p. 60.

determine the extent of a nonlinear relationship, the correlation ratio rather than the coefficient (as used in this study) would have to be computed.

Since one of the purposes of this study was to show the relation of the Home Index scale to achievement and intelligence, the product moment correlation coefficient was used. This was the most common method used in previous research studies and would thus tend to empirically validate or invalidate the Home Index scale.

The need exists then, for further research. The data available from this study should be of value in this respect.

CHAPTER V

SUMMARY

The relationship of socio-economic status to school achievement and intelligence was examined in this study. All obtained correlations proved to be of a positive nature.

The study group consisted of 225 eighth grade pupils from the two junior high schools in the same school system. The group was considered to be representative, having a standard deviation of 16.4 (N = 225) compared to a standard deviation of 16 (N = ∞) on the Terman-McNemar Test of Mental Ability, Form C.

The following data was collected from each pupil's personal file: name; age; latest Terman-McNemar Test score; latest Stanford Achievement Test grade placement score; and grades in English, mathematics, reading, and social studies, for the second semester of the seventh grade and first semester of the eighth grade. The reading grade was available for the second semester of the seventh grade only, and was used on that basis.

The Terman-McNemar Test was used as the criterion for intelligence. The criterion used for school achievement was the grade point average computed from grades earned in English, mathematics, reading (seventh grade only), and

social studies, in the second semester of the seventh grade and the first semester of the eighth grade. The criterion for socio-economic status was based on raw scores earned on the Home Index scale.

The Home Index scale was first administered to a pilot group (N = 19) and was re-administered after a six weeks interval; a test-retest correlation of .79 was obtained. The Home Index was then administered to the entire sample group by the pupils' respective homeroom teachers. Responses were then scored by the investigator, and recorded along with the other pertinent data.

All correlations obtained between the data were found by the Pearson Product Moment technique. Low correlations of .332 and .446 were found between socio-economic status and intelligence, and socio-economic status and school achievement, respectively. A moderate correlation of .723 was found between intelligence and school achievement. All of these correlations proved to be significant at the one per cent level of confidence.

A multiple correlation was computed in which socio-economic status and intelligence were the independent variables and school achievement the dependent variable. This correlation equaled .755. When the difference between the multiple correlation and the correlation of .723 obtained between intelligence and school achievement was

computed, the difference was found not to be significant at the five per cent level of confidence.

Even though socio-economic status appears to be positively related to school achievement and intelligence, the relationship does not seem of such a magnitude to warrant much practical value in a school situation. However, the findings do suggest that, in general, pupils of higher socio-economic status tend to have higher test intelligence and higher grade point averages while pupils of lower socio-economic status tend to have lower test intelligence and lower grade point averages.

The results of this investigation seem to agree with earlier findings. The newer technique of assessing socio-economic status with the Home Index scale appears to be of value with respect to its apparent reliability, validity, and ease of administration.

The findings of this study suggest the possibility that additional research might be conducted, using other variables and multiple regression techniques, in an effort to predict individual achievement. Also, the possibility exists that socio-economic status may, when correlated with an academic measure, yield a relationship which could be nonlinear.[1] If the relationship of socio-economic status

---

[1]Kenneth Eells, et al., Intelligence and Cultural Differences (Chicago: University of Chicago Press, 1951), p. 60.

to certain academic variables should prove to be nonlinear, the correlations obtained in this study would actually be an underestimate of the relationship existing between these variables. The data obtained in this investigation may be of value for further research, at least in a preliminary sense.

BIBLIOGRAPHY

A. BOOKS

Anastasi, Anne. Psychological Testing. New York: The Macmillan Company, 1954.

Edwards, Allen L. Statistical Analysis. New York: Rinehart and Company, Inc., 1946.

Eells, Kenneth., et al. Intelligence and Cultural Differences. Chicago: University of Chicago Press, 1951.

Garrett, Henry E. Statistics in Psychology and Education. Fourth edition. New York: Longmans, Green and Company, 1953.

Guilford, J. P. Fundamental Statistics in Psychology and Education. Second edition. New York: McGraw-Hill Book Company, Inc., 1942.

B. BOOKS: PARTS OF SERIES

Counts, George S. The Selective Character of American Secondary Education. Supplementary Educational Monographs. Chicago: Department of Education, University of Chicago, 1922.

C. PUBLICATIONS OF LEARNED SOCIETIES

Holley, Charles E. The Relationship Between Persistence in School and Home Conditions. Fifteenth Yearbook of the National Society for the Study of Education, Part II. Chicago: University of Chicago Press, 1916.

D. PERIODICALS

Chauncey, M. R. "The Relation of the Home Factor to Achievement and Intelligence Test Scores," Journal of Educational Research, 20:88-90, September, 1929.

Engel, T. L. "Home Environments and School Records," School Review, 42:590-598, October, 1934.

Garrison, K. C. "The Relative Influence of Intelligence and Socio-cultural Status upon the Information Possessed by First Grade Children," Journal of Social Psychology, 3:590-598, August, 1932.

Gough, Harrison G. "A Short Status Inventory," Journal of Educational Psychology, 40:52-56, January, 1949.

_____. "Factors Relating to the Academic Achievement of High-School Students," Journal of Educational Psychology, 40:74, February, 1949.

_____. "The Relationship of Socio-economic Status to Personality Inventory and Achievement Test Scores," Journal of Educational Psychology, 37:528, December, 1946.

Hilliard, George, H. and Eleanor Troxell. "Informational Background as a Factor in Reading Readiness and Reading Progress," Elementary School Journal, 38:255-263, December, 1937.

Neighbours, Owen, J. "Retardation in the Schools and Some of the Causes," Elementary School Teacher, 11:119-135, November, 1910.

Probst, Cathryn A. "A General Information Test for Kindergarten Children," Child Development, 2:81-95, June, 1931.

Stroud, J. B. "Predictive Value of Obtained Intelligence Quotients of Groups Favored and Unfavored in Socio-economic Status," Elementary School Journal, 43:97-104, October, 1942.

E. UNPUBLISHED MATERIALS

Bryan, Ruth. "A Study of the Relationship between Socio-economic Status and School Achievement," Unpublished Master's thesis, University of Iowa, 1941.

Lancaster, Elizabeth. "An Information Test for Children of Preschool age: II. General Science," Unpublished Master's thesis, University of Iowa, 1937.

Shaw, D. C. "A Study of the Relationships between Socio-economic Status and Pupil Achievement in Grades Four to Eight," Unpublished Master's thesis, University of Iowa, 1941.

Smith, Janet. "Performance of Preschool Children of Low Socio-economic Status on Information Test III: Social Geography," Unpublished Master's thesis, University of Iowa, 1939.

Williams, Helen C. "An Information Test for Children of Preschool Age: III. Social Geography," Unpublished Master's thesis, University of Iowa, 1939.

APPENDIX A

SAMPLE OF THE HOME INDEX SCALE FOR MEASURING SOCIO-ECONOMIC STATUS

_____School Room number_____

This is for research only. Do not sign. Please place an X in the proper space to the left of questions 1 through 20. Answer question number 21 with the appropriate number.

YES	NO		
___	___	1.	Is there an electric or gas refrigerator in your home?
___	___	2.	Is there a telephone in your home?
___	___	3.	Is there a bathtub in your home?
___	___	4.	Is your home heated by a central system, such as by a furnace?
___	___	5.	Does your family have a car?
___	___	6.	Did your mother go to high school?
___	___	7.	Did your mother go to a college or university?
___	___	8.	Did your father go to high school?
___	___	9.	Did your father go to a college or university?
___	___	10.	Does your home have a fireplace?
___	___	11.	Is there a piano in your home?
___	___	12.	Does your family have a servant, such as a cook or maid?
___	___	13.	Does your family leave town every year for a vacation?
___	___	14.	Does your mother belong to any clubs or organizations, such as study, art, or civic clubs?

YES NO

___ ___15. Does your father belong to any civic, study, service, or political clubs, such as the Lion's Club, Chamber of Commerce, etc.?

___ ___16. Have you ever had private lessons in music, dancing, art, etc., outside of school?

___ ___17. Do you have your own room at home?

___ ___18. Does your family take a daily newspaper?

___ ___19. Do you belong to any clubs where you pay dues?

___ ___20. Does your family have a radio-phonograph combination?

_____21. How many books does your family have?*

*The format of the scale was modified by the investigator, since the original scale was available only in context form.

APPENDIX B

SUMMARY OF THE INTER-CORRELATIONS OBTAINED IN THIS STUDY

TABLE IV

SUMMARY OF INTER-CORRELATIONS OBTAINED IN THIS STUDY

VARIABLES*	1	2	3	4	5	6	7	8	9	10	11	12
1. HI Boys				.497			.291			.303		
2. HI Girls					.353			.370			.364	
3. HI						.446			.573			.332
4. GPA Boys							.872			.747		
5. GPA Girls								.895			.718	
6. GPA									.884			.723
7. SA Boys										.855		
8. SA Girls											.847	
9. SA												.848
10. T-M Boys												
11. T-M Girls												
12. T-M												

*HI = Home Index, GPA = Grade Point Average, SA = Stanford Achievement Test, T-M = Terman-McNemar Test.