A COMPARATIVE STUDY OF THE RELATION OF SOCIO-ECONOMIC STATUS TO ACHIEVEMENT IN THE SIXTH GRADE

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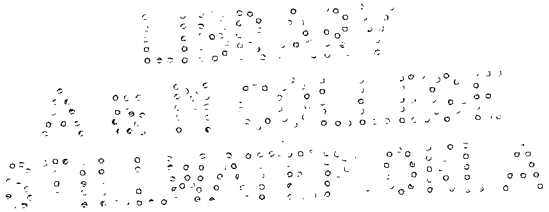

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C. L. J.

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CHAPTER I

INTRODUCTION

For five years the schools of Tulsa have felt the full force of destructive influences generated by the depression. Individuals, and the greater part of some communities have become dependent. Individual energy, industry, and virtue no longer guarantee the heads of many families a chance to make a living.

The children of these dependents constitute a little more than ten per cent of the pupils in the sixth grade of the elementary schools. During the last two years of our present economic crisis it has been necessary for these families to be cared for by charity. The burden became too heavy for the Community Fund during the past two years and was shared by Federal appropriations. These families are furnished food and clothing and the children are furnished one meal a day in the school cafeterias. It is these children that we are interested in in this study. Is the economic condition of the home reflected in the progress and achievement of sixth grade children? Do the children who are furnished their lunch in the cafeterias, accomplish as much in the sixth grade of the Tulsa schools, as those children of the same grade that are not on the free lunch list? The purpose of this investigation is to throw light on these questions.

In the city of Tulsa, as in any large city, the majority of the elementary schools draws pupils from the great

middle and the poor classes. Only three elementary schools had no children on the free lunch list in the sixth grade during the Spring of 1935. The patrons of these three schools are on, or much above, the subsistence income level.

During the last decade many studies have been made concerning the effect which environment has on the intelligence of school children.

The White House Conference[1] reports the following concerning the social factors of the home:

> Among the social factors which undoubtedly bear upon the structure and functioning of the family and tend to vary the family pattern are professional or occupational status of working members of the family--A study of the home environment of 8,000 school children indicates that the occupational status rises in relation to the socio-economic rating of the home. Another study shows that occupation--largely through its influence on economic status--affects the size of the family and the age of marriage.

The National Congress of Parents and Teachers[2] made the following report concerning the disintegration of the family:

> We are just beginning to realize that perhaps the greatest sufferer from these conflicts and frustrations is the child, who, with his great need for security, responds in no uncertain terms to the continual anxiety of his parents, to the carefully concealed antagonisms, and the lack of any common aim of purpose in the homes that are struggling with these constant perplexities.

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1 "The Family and Parent Education," White House Conference, 1930. Section III, p. 141. Louise Stanley, Chairman.

2 "Education for Home and Family," National Congress of Parents and Teachers, May 1-2, 1931, p. 55.

Kelly[3] has the following to say concerning the children of the unemployed:

> Few of my readers need to go outside their own neighborhoods to see that children are in danger of being scarred for life by this depression. Children listen in wide-eyed wonder to the irritable father who, once so good natured, scolds and curses now in his desperation. Mothers, always before cheerful and optimistic, are now dull and hopeless. While this anguish is bitter for father and mother, they will be but little changed when the cloud lifts and good times return. But the children! There is forming in them the disposition which will accompany them thru life. A childhood spent in a home atmosphere of despair, cynicism, and gloom is likely to leave its deep mark for life.

Terman[4] has the following to say concerning the cultural status of the home:

> It is not denied that the cultural status of the home (even apart from heredity) may affect the results of the test to some extent, although the influence has never been accurately determined. If it were considerable, we should find a marked rise of IQ in the case of children who had been removed from an inferior to a satisfactory home environment. Our data on this point are not extensive, but of a dozen or more children of this kind whom we have retested, not one showed improvement.

In the Twenty-Seventh Yearbook[5] of the National Society for the Study of Education, the following comments on the outcomes of the Chicago and Stanford investigations of foster children, dealing with the influence of home environment upon the mental development of children are made:

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[3] Fred J. Scars Kelly, Journal of the National Education Association, May, 1933, p. 146

[4] Lewis M. Terman, The Intelligence of School Children, pp. 13-14.

[5] The Twenty-Seventh Yearbook of the National Society for the Study of Education, Part 1, pp. 317-318.

(The Chicago study). "Average IQ increased from 91.2 to 93.7 during average foster home residence of 4 years in 74 cases of the pre-test group. This gain became 7.5 when a correction for age was applied. Children placed in homes above the average for this group gained .1 (5 points if corrected).

A newly committed group of 137 children not yet placed in homes had a mean C. A. of 9.3 and mean IQ of 88.6. The 260 legitimate foster children, with mean C. A. of 12.2, can probably be ascribed to environment.

(The Stanford Study). "A group of 214 foster children, whose average inheritance was judged to be close to normal or slightly above, had an average IQ of 107. The average environment of their foster homes was markedly superior, and the conclusion was drawn that 5 or 6 points of the excess over 100 IQ could be explained by environment.

Comment. The investigators agree in attributing small, but significant increments of IQ to superior environment. There are no grounds, in the data as reported in the two studies, upon which to compare the environmental level of California and Illinois families directly; but it seems reasonable to suppose that the two groups are not widely different in average cultural status. If this is the case, the increments of IQ due to environment should be about the same, as indeed they are found to be.

The foregoing analyses of the influence of the social factor on the child give theoretical justification for assuming that the "home factor" bears a direct relation to such other factors as the achievement and intelligence of school children.

Our problem is to determine the relation of the "home factor" to the factors of achievement and intelligence of sixth grade children. Is there a significant difference in the scores of the children on the free lunch list, as compared with those not on the free lunch list in the sixth grade?

CHAPTER II

METHOD OF PROCEDURE

Until the development of mental measurements, there was no evidence to deny that children of the same age differed in individual capacity to achieve in school. The introduction of educational measurements offered definite proof that individual differences in mental ability were significant factors in the accomplishment of school children.

This evidence to a high degree, exposed the lack of adjustment of the schools to children with a wide range of mental ability.

Leta Hollingsworth,[1] in her book, "Gifted Children", makes the following comments:

> The methods of mental measurement have demonstrated that even in the United States, where we had supposed all children to be mingling freely with others of every walk of life, segregations of the gifted have unintentionally occurred to a marked extent. These segregations have come about on the basis of social and economic selection. It was not a conscious purpose to segregate the gifted from those of inferior intellectual powers, but this automatically happened, as able parents strove to keep their children clean, free from crowds and contagion, and to secure for them the benefits of teaching in small and congenial groups.

The discovery of a high positive relationship between academic success and mental level may not account for all the factors that may influence achievement of school children.

Hence, the question to be answered in this investigation: Does the home as measured by a socio-economic status test,

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[1] Leta Hollingsworth, Gifted Children, pp. 71-72.

account for differences in the accomplishment of sixth grade children?

The Data. The Tulsa city schools keep on file, in the office of the director of tests and measurements, all scores on intelligence and achievement tests. From these records the following was obtained:

1. Scores of the Henmon-Nelson Tests of Mental Ability Form A.
2. Scores of the Stanford Achievement Test - Advanced Form Y.
3. Chronological Age.
4. Scores of the Sims Socio-Economic Status Test - Form C. were obtained with the aid and cooperation of the principals of the twenty-one elementary schools that participated in this investigation. The author is indebted to these principals for their kind assistance in giving the Sims Socio-Economic Status Test.

Socio-Economic Status. The Sims Score card for Socio-Economic Status, was edited by Verner M. Sims of Alabama University. Doctor Hartshore and Doctor May of Teachers College, Columbia University cooperated with Doctor Sims during the later stages of the work, for helpful criticisms and other assistance.

The score card is the product of somewhat extended experimentation carried on at the School of Education, Yale University. The obvious merit of the score card as a device is that it yields quantitative records and permits statistical comparisons. Home conditions may be given a numerical

rating that is certainly far more precise than the usual verbal characterizations of "average" or "poor" or "good".

The test consists of twenty-three items to be answered by the student. Each pupil is required to answer at least twenty of the twenty-three items of the score card.

Each score card was scored by means of a scoring key.

The percentiles of the socio-economic status test are based upon scores from a fairly unselected group of 686 sixth, seventh, and eighth grade children from the schools of New Haven, Connecticut.

While the test as a whole should be considered as merely provisionally applicable elsewhere, many of the items have been validated through use in other tests. From this fact, and the facts of the authorship and content, we may conclude that the socio-economic status test scores possess enough validity to justify the uses made of them in this investigation.

Treatment of Data. After scoring the Sims Socio-Economic Status Test and recording the results, the next step was to find the means and standard deviations for the following factors; doing each group separately: Socio-Economic Status, Educational Age, Mental Age, Chronological Age, Intelligence, Educational Quotients, and Achievement Quotients.

Educational Quotients were determined by dividing the E. A. by the C. A.

Intelligence quotients were obtained by dividing the M. A. by C. A.

Achievement quotients were obtained by dividing the E. A. by the M. A.

The significance of the difference between the means of the free lunch and the non-free lunch group was determined by the standard error of the difference between two means. This reveals the chances in 100 that one group will rank higher than the other for some particular factor, such as mental age.

By means of the Bi-Serial R technique, the coefficient of correlation was determined for socio-economic status scores for pupils on the free lunch and non-free lunch lists. This technique was used in order to determine the degree of relationship between the home factor, socio-economic status, educational age, mental age, chronological age, intelligence quotients, educational quotients, and achievement quotients.

Simple (zero order) Pearson product - moment coefficients of correlation were computed for the following variables of the two groups: mental age and socio-economic status; educational age and socio-economic status; chronological age and socio-economic status; and mental age and educational age.

The significance of the difference between the r's of non-free lunch and the free lunch group, as revealed by the Pearson product-moment coefficients, were determined by the PE of the difference between two r's. This reveals the chances in 100 that one group will rank higher than the other for a particular pair of variables, such as mental age and educational age.

Summary. 1. To determine the relationship of socio-economic status to such other factors as achievement, intelligence, and chronological age of children on the free lunch list of the sixth grade as compared with those not on the free lunch list of the same grade.

2. Scores on the Henmon-Nelson Test of Mental Ability-Form A., The Stanford Achievement Test-Advanced Form Y., and Chronological ages were compiled from available records in the office of the director of tests and measurements.

3. As a means of comparison, two groups of sixth grade children were used.

a. Children on the free lunch list, or those children that were given one meal a day in the cafeteria because of unemployment in the home.

b. The non-free lunch group, or those children in the sixth grade that were not on the free lunch list.

4. The means and standard deviations were computed for each group separately.

5. The means of the various factors were computed, and the difference between the means was determined by the standard error of the difference between two means. This process indicates the chances in 100 that one group will equal or exceed the other for any of the factors considered.

6. To determine the relationship between the "home factor" for the two groups, and the other factors studied in this investigation, it was decided that the biserial coefficient of correlation would best serve our purpose.

7. Simple (zero order) Pearson product-moment coefficients of correlation were determined to show the relationship between the following factors of the two groups: mental age and socio-economic status; educational age and socio-economic status; chronological age and socio-economic status; and mental age and educational age.

CHAPTER III

TREATMENT OF DATA

The purpose of this chapter is to compare the non-free lunch and free lunch groups of sixth grade pupils with respect to socio-economic status, achievement, intelligence, and chronological age.

In attacking this problem, three different procedures have been employed:

1. The significance of the difference between the means of the free lunch and non-free lunch groups was determined by the standard error of the difference between two means, for each of the following factors: Socio-economic status, educational age, mental age, chronological age, intelligence quotients, educational quotients, and achievement quotients.
2. The Bi-Serial R coefficient of correlation was used for the purpose of determining the degree of relationship that exists between the socio-economic status, achievement age, mental age, chronological age, intelligence quotient, educational quotient, and achievement quotient for pupils on the free lunch list and those not on the free lunch list of the sixth grade.
3. The (zero order) Pearson product-moment coefficients of correlation were determined for the free lunch and non-free lunch groups for educational age and socio-economic status; mental age and socio-economic status; chronological age and socio-economic status; and educational age and mental age.

THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE MEANS OF THE TWO GROUPS

Table I reveals that the mean of the non-free lunch group is 12.75, and that of the free lunch group is 7.2 points for socio-economic status. In order to determine the probable divergence of this difference from the true difference between the two groups, it is necessary to divide the difference between the means by the standard error of the difference. If this quotient is equal to three or more, we may be assured that the difference is significant, and that the chances are 99.9 out of 100, that the difference will always be greater than zero.

The difference of 5.5 points for the means of the free lunch and non-free lunch group for soci-economic status is great enough to guarantee that the mean of the non-free lunch group will always exceed that of the free lunch group.

The mean of the non-free lunch group is 12 years and one month for educational age. This exceeds the mean of the free lunch group (11 years and 6 months) by seven months. This difference is great enough to guarantee that the non-free lunch group will always exceed the free lunch group.

The mean of the non-free lunch group is 11 years and 9 months for mental age. This exceeds by 8 months the mean of 11 years and one month for the free lunch group. The

chances are 99.9 in 100 that the non-free lunch group will always exceed the free lunch group for mental age.

TABLE I

DATA FOR COMPUTING THE BISERIAL RELATIONSHIP BETWEEN PRESENCE IN OR ABSENCE FROM THE FREE LUNCH GROUP, WITH RESULTING COEFFICIENTS FOR THE SEVEN FACTORS

Index	S.E.S.	M.A.	E.A.	C.A.	I.Q.	E.Q.	A.Q.
N_2^*	240	240	240	240	240	240	240
N_1	240	240	240	240	240	240	240
N_{1-2}	480	480	480	480	480	480	480
M_2	12.75	11-9	12-1	11-11	99.2	102	103.58
M_1	7.2	11-1	11-6	12-6	89.5	92.7	103.97
$Sigma_{1-2}$	6.30	17.89	12.92	11.79	15.84	13.52	8.72
Bis. R.	.54	.28	.339	-.329	.382	.428	-.028
PE:	∓.024	∓.024	∓.033	∓.033	∓.031	∓.032	∓.038
M^2-M^1	5.5	8 mo.	7 mo.	7 mo.	9.67	9.25	.39

*Subscript$_2$ refers to non-free lunch group; subscript$_1$ to free lunch group.

The mean of the free lunch group is 12 years and 6 months, and that of the non-free lunch group 11 years and 11 months for chronological age. The difference of seven months reveals that the chances are 99.9 in 100 that the children of the free lunch group will always be older than those not on the free lunch list.

The mean of the non-free lunch group is 99.2 points for intelligence quotients. The free lunch group have a mean of 89.5 points for this factor. The difference of 9.67 points reveals that the chances are 99.9 in 100, that the

children of the non-free lunch group will always be brighter than those of the free lunch group.

The mean of the non-free lunch group is 102, and that of the free lunch group 92.7 points for educational quotients. The difference of 9.25 points is in favor of the non-free lunch group and reveals that the chances are 99.9 in 100, that the children of the non-free lunch group will always exeed the children of the free lunch group in doing sixth grade work.

The mean of the free lunch group is 103.97, and that of the non-free lunch group 103.58 points for achievement quotients. The difference of .39 of one point is small and the chances are only 85 in 100, that the children of the free lunch group will achieve more according to their ability than will the children of the non-free lunch group.

Summary. The socio-economic status mean score of 7.2 points for the free lunch group, represents a medium low condition of socio-economic status, according to the Sims standards.

The mean score of 12.7 points for the non-free lunch group represents a medium high score of socio-economic status. Since the Sims Manual of Directions gives a score of ten as a "theoretically perfect home,"[2] it is clear that in this investigation, there is a relative difference in the socio-economic status of the free lunch and non-free lunch group as measured by the Sims score card.

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[2] Verner M. Sims, "Score Card for Socio-Economic Status," Manual of Directions, p. 11.

The differences are statistically significant, and show a reliable difference in socio-economic status, educational age, mental age, chronological age, intelligence quotient, educational quotient, and to some extent, achievement quotient.

THE RELATIONSHIP AS SHOWN BY THE BISERIAL COEFFICIENTS OF CORRELATION

The biserial coefficients of correlation make it possible to determine the degree of relationship that exists between two groups which have been formed on the bases of a qualitative factor such as free lunch and non-free lunch groups and socio-economic status, educational age, chronological age, or mental age.

For the purpose of this study it was considered advisable to know whether there was any relationship existing between the free lunch and non-free lunch groups with respect to socio-economic status, educational age, mental age, and chronological age.

The biserial coefficient of correlation formula:[3]

$$r \text{ bis} = \frac{Y_2 - Y_1}{\sigma_y}\left(\frac{pq}{z}\right)$$

and the probable error, when q is not less than .05, as in the present investigation, is

$$\text{P. E. (bis.r)} = .6745\ \frac{\left(\sqrt{\frac{pq}{z^2}} - r^2\right)}{\sqrt{N}}$$

Socio-Economic Status Scores of Free Lunch and Non-Free Lunch groups, Table II, presents the distribution of scores for the non-free lunch and free lunch groups for

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[3]Karl J. Holzinger, Statistical Methods for Students in Education, pp. 271-273.

TABLE II

SOCIO-ECONOMIC STATUS SCORES OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Socio-Economic Status Scores	Free Lunch	Non-Free Lunch	Total
30-31	-	1	1
28-29	-	4	4
26-27	2	3	5
24-25	-	7	7
22-23	1	14	15
20-21	2	17	19
18-19	2	15	17
16-17	5	25	30
14-15	8	18	26
12-13	21	21	42
10-11	26	38	64
8-9	33	13	46
6-7	40	21	61
4-5	39	21	60
2-3	47	19	66
0-1	14	3	17
Total	240	240	480
Mean	7.2 points	12.75 points	
Sigma	4.72 points	2.15 points	
Bis. R.	.546±.024		

socio-economic status, together with the mean, sigma, and biserial coefficients of correlation.

The biserial coefficient of correlation is .546 ±.024. The relationship is positive and indicates that there is a tendency for the children on the non-free lunch list to be associated with relatively high socio-economic status, and for children on the free lunch list to be associated with relatively low socio-economic status.

The evidence indicates that there is a difference in the homes of the free lunch and non-free lunch groups. Hereafter this difference will be discussed as the home factor.

Relation of the Home Factor to Achievement. Table III presents the distribution of scores for the non-free lunch and free lunch group for educational ages, together with the mean, sigma, and biserial coefficients of correlation.

The biserial coefficient of correlation is .34 ±.033. This relationship is positive and reveals a significant relationship between the home factor and achievement. Hence, there is a relationship between being on the free lunch list and the non-free lunch list and achievement in the sixth grade.

Relation of the Home Factor to Mental Ability. Table IV presents the distribution of scores for the non-free lunch group and free lunch group for mental age level. Although the biserial coefficient of correlation is .28 ±.034, and indicates a positive and significant relationship, it is not as high a relationship as are the coefficients of correlation for socio-economic status and achievement. It is

TABLE III

EDUCATIONAL AGES OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Educational Ages		Free Lunch	Non-Free Lunch	Total
15-6	15-11	-	2	2
15-0	15-5	1	2	3
14-6	14-11	1	7	8
14-0	14-5	1	5	6
13-6	13-11	4	7	11
13-0	13-5	9	18	27
12-6	12-11	23	50	73
12-0	12-5	33	33	66
11-6	11-11	50	46	96
11-0	11-5	46	30	76
10-6	10-11	46	27	73
10-0	10-5	13	9	22
9-6	9-11	9	3	12
9-0	9-5	3	1	4
8-6	8-11	1	-	1
	Total	240	240	480
	MEAN	11 yrs,6 mo.	12 yrs, 1 mo.	
	Sigma	11.7 mo.	13.75 mo.	
	Bis. R	.339 ± .033		

TABLE IV

MENTAL AGES OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Mental Ages		Free Lunch	Non-Free Lunch	Total
17-0	17-5	-	1	1
16-6	16-11	1	1	2
16-0	16-5	-	1	1
15-6	15-11	-	2	2
15-0	15-5	-	-	-
14-6	14-11	2	3	5
14-0	14-5	4	15	19
13-6	13-11	7	8	15
13-0	13-5	11	12	23
12-6	12-11	13	28	41
12-0	12-5	25	34	59
11-6	11-11	26	37	63
11-0	11-5	41	28	69
10-6	10-11	34	21	55
10-0	10-5	31	27	58
9-6	9-11	17	10	27
9-0	9-5	14	6	20
8-6	8-11	11	6	17
8-0	9-5	1	-	1
7-6	7-11	2	-	2
	Total	240	240	480
	MEAN	11-1 yrs.	11-9 yrs	
	Sigma	16.86 mo.	18.03 mo.	
	Bis. R =	.28 ±.034		

obvious from the size of the PE that this value is more than could be accounted for by errors of sampling. This indicates that there is a tendency for socio-economic status and mental ability to be associated.

Relation of the Home Factor to Chronological Age. Table V presents the distribution of scores for the non-free lunch and free lunch group for chronological ages. The biserial coefficients of correlation is $-.329 \pm .033$. This is a significant negative relationship and reveals that the non-free lunch group have tended to progress more rapidly than have the pupils of the free lunch group.

Relation of the Home Factor to Intelligence Quotients. Table VI presents the distribution of scores for the non-free lunch group and free lunch group for intelligence quotients. The biserial coefficient of correlation is $.38 \pm .031$. This is a significant positive relationship and reveals that the non-free lunch group is relatively brighter than are the children of the free lunch group.

Relation of the Home Factor to Educational Quotients. Table VII presents the distribution of scores for the non-free lunch and free lunch group for educational quotients. The biserial coefficient of correlation is $.43 \pm .032$. This is a significant and positive relationship that reveals the non-free lunch group learn more effectively than do the pupils of the free lunch list.

Relation of the Home Factor to Achievement Quotients. Table VIII presents the distribution of scores for the non-free lunch and free lunch group for achievement quotients.

TABLE V

CHRONOLOGICAL AGES OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Chronological Ages		Free Lunch	Non-Free Lunch	Total
16-0	16-5	3	-	3
15-6	15-11	-	-	
15-0	15-5	2	-	2
14-6	14-11	6	1	7
14-0	14-5	11	3	14
13-6	13-11	23	3	26
13-0	13-5	29	13	42
12-6	12-11	43	34	77
12-0	12-5	45	61	106
11-6	11-11	46	61	107
11-1	11-5	20	40	60
10-6	10-11	10	20	30
10-0	10-5	2	4	6
	TOTAL	240	240	480
	Mean	12-6 yrs.	11-11 yrs	
	Sigma	12.85 mos.	9.31 mos.	
	Bis. R.	$-.329 \pm .033$		

TABLE VI

INTELLIGENCE QUOTIENTS OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Intelligence Quotients	Free Lunch	Non-Free Lunch	Total
145-149	1	1	2
140-144	-		-
135-139	-	4	4
130-134	-	5	5
125-129	-	3	3
120-124	4	14	18
115-119	7	12	19
110-114	11	24	35
105-109	15	20	35
100-104	17	22	39
95-99	34	44	78
90-94	24	26	50
85-89	36	24	60
80-84	26	18	44
75-79	30	10	40
70-74	18	8	26
65-69	12	4	16
60-64	2	1	3
55-59	3	-	3
Total	240	240	480
Mean (IQ)	89.58	99.25	
Sigma	14.48	15.67	
Bis. R.	.38 $\pm$ .031		

TABLE VII

EDUCATIONAL QUOTIENTS OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Educational Quotients	Free Lunch	Non-Free Lunch	Total
135-139	-	3	3
130-134	2	3	5
125-129	1	10	11
120-124	1	8	9
115-119	5	12	17
110-114	11	27	38
105-109	24	26	50
100-104	32	39	71
95-99	28	49	77
90-94	36	29	65
85-89	36	16	52
80-84	27	11	38
75-79	21	5	26
70-74	9	2	11
65-69	6	-	6
60-64	1	-	1
Total	240	240	480
Mean (E.Q)	92.77	102	
Sigma	12.66	12.74	
Bis. R.	.428 $\pm$.032		

TABLE VIII

ACHIEVEMENT QUOTIENTS OF FREE LUNCH AND NON-FREE LUNCH CHILDREN OF THE SIXTH GRADE

Achievement Quotients	Free Lunch	Non-Free Lunch	Total
135-139	1	1	2
130-134	-	1	1
125-129	1	2	3
120-124	6	6	12
115-119	15	11	26
110-114	42	31	73
105-109	46	58	104
100-104	61	52	113
95-99	34	43	77
90-94	23	26	49
85-89	9	7	16
80-84	1	2	3
75-79	1	-	1
Total	240	240	480
Mean =	103.97	103.58	
Sigma =	8.72	8.70	

Bis. R = $-.028 \pm .038$

The biserial coefficient of correlation is -.033 -.038. Four times the PE is more than the biserial coefficient of correlation. Hence, the relationship is not significant. This indicates that there is no relationship between being on the free lunch list and relatively higher achievement as compared with their ability to do sixth grade work.

Summary. In the light of these data, there is a relationship between the type of home and the factors of educational age, mental age, chronological age, intelligence quotient, educational quotient, and achievment quotient.

The achievement quotient was the only factor that did not indicate a significant relationship between the two groups.

THE RELATIONSHIPS AS SHOWN BY THE PEARSON PRODUCT MOMENT COEFFICIENTS OF CORRELATION

For the purpose of showing the relationship between the types of homes and the factors of educational ages, mental ages, chronological ages, and between educational ages and mental ages, the (zero order) Pearson product-moment coefficients of correlation were determined for the free lunch and non-free lunch groups.

TABLE IX

PEARSON PRODUCT-MOMENT (r) COEFFICIENTS OF CORRELATION FOR THE FREE LUNCH AND NON-FREE LUNCH GROUPS

	Free Lunch	Non-Free Lunch
C. A. and S. E. S.	-.178 ±.042	-.346 ±.038*
M. A. and S. E. S.	.013 ±.043	.177 ±.043
E. A. and S. E. S.	.207 ±.043	.195 ±.043
E. A. and M. A.	.755 ±.019	.802 ±.016

*Sampling errors are stated in terms of P. E.

The results are given in Table IX. The (zero order) Pearson Product-moment coefficients of correlation for C. A. and S. E. S. are -.178 ±.042 for the free lunch group and -.346 ±.038 for the non-free lunch group.

In order to determine if the difference in the obtained r's of the free lunch and non-free lunch groups will always be greater than zero, it is necessary to determine the PE of the difference between the two r's. If the true difference is four or more times the PE (diff), we may be assured that the difference between the r's is significant, and that the chances are 99.7 out of 100, that the difference will always be greater than zero.

The difference between the zero order coefficients of correlation for chronological age and socio-economic status is negative, and the PE (diff) indicates that 98 chances out of 100, the children of the free lunch group will outrank the children of the non-free lunch group.

The difference between the zero order coefficients of correlation for educational age and mental age is positive. The coefficients are .733 ± .019, for the free lunch group and .802 ±.016, for the non-free lunch group. The difference between the r's of the two groups reveals that 94 times out of 100, the non-free lunch group will rank higher than the free lunch group.

The difference between the zero order coefficients of correlation for mental age and socio-economic status is positive and reveals that there are 94 chances out of 100, that the non-free group will be greater than the free lunch group.

The difference between the zero order coefficients of correlation for educational age and socio-economic status is positive and reveals that there are only 53 chances out of 100, that the free lunch group will exceed the non-free lunch group.

Summary. The difference between the r's of the free lunch and the non-free lunch group, reveals that there is a difference for each of the relationships considered. The fact that there is a difference in the performance of the two groups does not necessarily mean that the differences are significant, or even show a tendency to be reliable. The difference between the r's of chronological age and socio-economic status have a tendency to be significant. The difference between the r's of educational age and mental age also have a tendency to be significant. The difference between the rate of mental growth and educational growth reveals that the non-free lunch group has progressed relatively more rapidly than have the children of the free lunch group of the sixth grade.

While the differences are not statistically significant, they do show tendencies toward a reliable difference for each of the paired factors except educational age and socio-economic status.

SUMMARY

The data in chapter III indicate the relationship of socio-economic status to such other factors as educational age; mental age, and chronological age of children on the free lunch list and those not on the free lunch list of the sixth grade.

In order that comparisons might be pointed out, the scores of the two groups were tabulated and frequency tables made for each group. The mean, sigmen, and biserial coefficients of correlation were determined for each factor considered.

Tables I and VIII are given to aid in the interpretation of the data. A survey of this chapter indicates that there is a difference between the mean scores of the free lunch and non-free lunch groups of the sixth grade.

The non-free lunch mean exceeded the mean of the free lunch group for each factor except chronological age and achievement quotients. The children of the free lunch group were seven months older than the non-free lunch group, and achieved more in proportion to their ability to achieve by .39 of a point. Since the biserial coefficient of correlation for achievement quotients is $-.048 \pm .034$, the difference is not significant.

The zero order values are positive for all coefficients of correlation except chronological age and socio-economic status. This agrees with the biserial coefficients of correlation for chronological ages.

While the results of the zero order values are low for each of the paired factors, the coefficients of correlation are more than four times PE, except for mental age and socio-economic status for the free lunch group. Hence, we may assume that all but the one coefficient of correlation are reliable.

If there were no difference between being on the free lunch list and the non-free lunch list, one would expect the means to be approximately equal in value. Also, the coefficients of correlation should be low or inconsistent. Since such results were not obtained in this investigation, it appears to be evident that children from inferior homes tend to be retarded, and that children from superior homes are less retarded in their progress through the schools.

The data indicate, a significant difference in favor of the non-free lunch group as compared with the free lunch group for all factors except achievement quotients. We may conclude that the socio-economic status of the home is a factor that tends to accelerate the progress of children of superior homes and retard the children of poor socio-economic status in school accomplishments.

CHAPTER IV

CONCLUSIONS

The following conclusions are drawn from a study of the data contained in this investigation.

(1) The children of the non-free lunch group of the sixth grade exceed the children of the free lunch group for every factor except chronological age and achievement quotients. The children of the free lunch group were seven months older than the children of the non-free lunch group. The biserial coefficient of correlation of -.048 -.034, for achievement quotients indicates that there is relatively no difference between the two groups in achievement as compared with their ability to achieve.

The biserial coefficient of correlation for chronological age is -.37 ±.027, which indicates that there is a reliable difference between the ages of the two groups.

THE DIFFERENCE BETWEEN THE MEANS OF THE TWO GROUPS

(2) Table IX reveals that the mean of the non-free lunch groups exceeds the mean of the free lunch group by 5.5 points for socio-economic status. The difference for this factor reveals that the chances are 99.9 out of 100, that the non-free lunch group will always rank higher in socio-economic status.

(3) The mean of the non-free lunch group exceeds the mean of the free lunch group by seven months for educational ages. The difference of 99.9 chances out of 100, will always be in favor of the non-free lunch group.

(4) The mean of the non-free lunch group exceeds that of the free lunch group by eight months for mental ages.

The chances are 99.9 in 100, that this difference will always be in favor of the non-free lunch group.

(5) The difference between the means for chronological ages indicates that the chances are 99.9 in 100, that the free lunch group will always be older chronologically than the children of the non-free lunch group.

(6) The difference of 9.67 points between the means of the two groups for intelligence quotients, indicates that there are 99.9 chances out of 100, that the children of the non-free lunch group will always be brighter than the children of the free lunch group.

(7) The difference between the means for educational quotients indicates that the chances are 99.9 in 100, that the children of the non-free lunch group will always accomplish more than will the children of the free lunch group of the sixth grade.

(8) The difference between the means for achievement quotients is .39 of one point. This indicates that the chances are only 85 out of 100, that the free lunch group will achieve more according to their ability than will the children of the non-free lunch group.

(9) The fact that the differences are greater than zero for all the factors in this investigation, indicates that there is a difference between the two groups.

THE BISERIAL COEFFICIENTS OF CORRELATION

(10) The biserial coefficients of correlation are .54 $\pm$.024, for socio-economic status; .33 $\pm$.032, for educational ages; .28 $\pm$.034, for mental ages; -.329 $\pm$.033, for

chronological ages; .38 ±.031, for intelligence quotients; .42 ±.032 for educational quotients. The coefficients of correlation for mental ages and achievement quotients are below 0.30; such a correlation is usually considered the lowest that is significantly different from zero. The biserial coefficient of .28 ±.034, for mental ages is more than four times PE. Therefore, the coefficient of correlation indicates a tendency to be reliable.

(11) The socio-economic status of the home has a tendency to be associated with such other factors as educational age, mental age, chronological age, intelligence quotient, and educational quotient for children of the sixth grade.

THE DIFFERENCE BETWEEN THE R'S OF THE TWO GROUPS

(12) The difference between the r's of the two groups for educational age and socio-economic status, reveals that the chances are 53 out of 100, that the difference will be in favor of the free lunch group.

(13) The chances are 94 out of 100, that the difference in the r's for mental age and socio-economic status will be in favor of the non-free lunch group.

(14) The difference in the r's for chronological age and socio-economic status reveals that the chances are 98 out of 100, in favor of the non-free lunch group.

(15) The difference between the r's of the two groups for educational ages and mental ages, reveals that 94 times out of 100, the non-free lunch group will always progress more rapidly than will the children of the free lunch group.

(16) The fact that the differences are greater than zero for all the factors considered in this investigation, suggests the need of parents to make every effort possible toward creating the best possible conditions in the home ever looking toward the greater success of their children in school accomplishment. It also indicates that the Better Housing Program, advocated by the National and State Governments, will, if carried out, amply repay the tax payers by insuring the greater success of the future generation of laborers in their struggle to be self-sustaining.

(17) This study has revealed the tendency for the influence of the home to follow the child into the school. The home is found to be an important factor in the education of the child.

The school should therefore strive to develop a deeper and more sympathetic understanding of present day family problems.

Teachers should be concerned with those individuals that come from homes where members are unable to obtain gainful employment. They should utilize every means at their command to shield their pupils from mental insecurity and anxieties which interfere in the developing of wholesome personalities.

BIBLIOGRAPHY

Almack, John C. Research and Thesis Writing. Houghton Mifflin Company, Boston, Mass., 1930.

Chauncey, Marlin R. The Relation of the Home Factor to Achievement and Intelligence Test Scores. Journal of Educational Research, September, 1929.

Cubberley, Ellwood P. The Principal and His School. Houghton Mifflin Company, Boston, Mass., 1923.

Freeman, Frank N. Mental Tests. Houghton Mifflin Company, Boston, Mass., 1926.

Garrett, Henry E. Statistics in Psychology and Education. Longmans, Green and Company, New York, 1926.

Holzinger, Karl J. Statistical Methods for Students in Education. Ginn and Company, Boston, Mass., 1928.

Hollingsworth, Leta S. Gifted Children. The MacMillan Company, New York, 1926.

Kelly, Fred J. Scars. Journal of the National Education Association, May, 1933.

Odell, C. W. Educational Statistics. The Century Company, New York, 1925.

Fourth Yearbook of Parent Education. The National Congress of Parents and Teachers. 1201 Sixteenth St., N. W., Washington, D. C., 1934.

Reeder, Ward G. How to Write a Thesis. Public School Publishing Company, Bloomington, Ill., 1930.

Sims, Verner M. Score Card for Socio-Economic Status. Manual of Directions. Public School Publishing Company, Bloomington, Ill., 1927.

Symonds, Percival M. Measurement in Secondary Education. The MacMillan Company, New york, 1927.

Terman, Lewis M. The Intelligence of School Children. Houghton Mifflin Company, New York, 1919.

Twenty-Seventh Year Book, Part 1. Nature and Nurture. Public School Publishing Company, Bloominggon, Ill., 1928.

White House Conference, 1930. White House Conference on Child Health and Protection. The Century Company, New York, 1931.

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