

A COMPARISON OF THE ACHIEVEMENT OF JUNIOR HIGH  
SCHOOL PUPILS FROM FAMILIES ON THE RELIEF  
ROLLS WITH THE ACHIEVEMENT OF PUPILS  
FROM FAMILIES NOT ON THE RELIEF  
ROLLS

STRATHMORE PARCHMENT

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By

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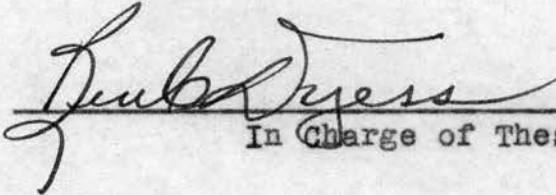
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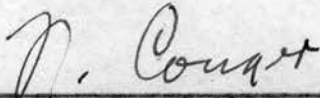
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CHAPTER I  
INTRODUCTION

This study was made for the purpose of determining just what effect, if any, being upon the relief rolls had upon the achievement of junior high school pupils who come from such families. This effect is to be determined by making a comparison of two groups; one that comes from families on the relief rolls and the other that comes from families not on the relief rolls. In many schools it is felt that pupils who are dependent upon public assistance for the necessities of life are definitely handicapped and are not capable of the same achievement as those who are economically more fortunate.

It is not the purpose of this study to give consideration to all the ramifications of the subject but rather to limit it to the following questions:

1. Do pupils who come from families that are on the relief rolls achieve the same as those pupils whose families are not on the relief rolls?
2. When the intelligence of pupils from the two groups are considered, are their achievements the same.
3. When both attendance and intelligence are considered, will the two groups have the same achievement?

The graduating class from the Longfellow Junior High School was selected for the purpose of this study. This school is located in Enid, Oklahoma, which has a population of about 27,000; it is located in a fine agricultural region and also has two fairly large oil refineries. There are very few foreign-born people living in the city. The population is composed almost entirely of native-born American people. The public school system has an enrollment of approximately 5,600, of which number 1,100 are in the senior high school, consisting of grades ten, eleven, and twelve. There are two junior high schools, one located in the west half of the city and the other in the eastern half of the city. The Longfellow School is the school located on the east side of the city. The territory from which the school draws its pupils ranges from some unusually poor sections of the districts in the undesirable residential section near the railroad yard and refineries to the cultured atmosphere which marks the section near the college campus. Phillips University is located in the eastern edge of Enid, and the section surrounding it is made up largely of the faculty homes or homes of other people of this cultured type. The enrollment in the junior high schools varies from 650 to 700. This year (1936) the enrollment was 672 for the entire school,



of which 232 were in the ninth grade. This class is representative of other graduating classes.

The school records were examined and all students in the ninth grade who had complete records for the three years of junior high school work were selected for this study. Many of the records were incomplete, especially those of pupils who had been transferred from other schools. After those with incomplete records had been eliminated, there were 187 left, which could be used. The county relief rolls were then checked against this number and it was found that there were 27 who came from families that were so registered. These two groups were then made the basis of this study.

As mentioned above, the source of the data was the school records of the Longfellow Junior High School and the Garfield County relief rolls. The latter were used only for the purpose of determining which pupils came from families on relief. The following information was taken from the office cards or permanent records; the intelligence quotient, chronological age, average grade in each subject by semesters, and the average daily attendance.

The I. Q. was secured and entered upon the permanent record of the student at the time of his first enrollment in the Enid public schools. In many cases this record was made in the first or second grade; it has been the

policy of the schools to secure this record at the earliest possible time. The Stanford Revision of the Binet-Simon test is administered by teachers who have had experience in using the test. Teachers new in the system are required to observe and practice under the guidance of experienced teachers before they are permitted to give the test. ✓

The marks which are used in this study as a basis of school achievement were made over a period of three years, or the work accomplished during the seventh, eighth, and ninth grades. Most of the subjects are taught by different teachers in each grade. When the marks are averaged for the three years, the result is the concensus of opinion of the three teachers. This is the mark used. To make this more clear, the subject of English might be used as an example. It is taken in junior high school for three years, and is taught each year by a different teacher. There are some minor exceptions to this example, which will be fully explained in Chapter II. The age and attendance are simply a matter of record, which is kept very similarly in all schools.

The material offered in evidence is presented in the form of tables. These titles are self-explanatory. Each table is preceded by an explanation and followed by a discussion or interpretation. In many cases the results are obvious.

The two groups are compared upon the basis of the central tendencies, and variability of their respective scores or grades for each subject and the general average for all subjects. The probable error is computed for each subject and also for the difference in the means of the average grade. Individual comparisons are made upon the basis of approximately equal intelligence and of approximately chronological ages.

## CHAPTER II

## AN ANALYSIS OF THE DATA

In order to secure a more comprehensive view of the problem that is involved in this study the various factors and elements that have a direct bearing on the subject will be analyzed and explained in terms of their relation to the study. Before proceeding with the analysis it will be well to set out the vital factors that are involved. They are:

1. Intelligence
2. Achievement
3. Attendance
4. Economic Status

## INTELLIGENCE

Perhaps the most significant question that can be asked concerning intelligence is - What is intelligence? After considering the answer to this question as given by eminent psychologists and educators we may summarize them as far as school matters are concerned as, "Ability to learn or to adapt oneself to new situations in life."<sup>1</sup> That is, a pupil's intelligence is always a matter of equipment with which nature endowed him plus what he has learned.

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<sup>1</sup>Walter F. Dearborn, Intelligence Tests, pp. 93-94.

Before the advent of intelligence tests, particularly those capable of being administered to groups, the only basis on which the intelligence of pupils could be reported was the judgment of those who were acquainted with them. A parent's estimate of the intelligence of his boy or girl is usually considered valueless. A teacher's estimate of the ability of a pupil is usually influenced by age, industry, personality, appearance, and other factors.

The use of intelligence tests has made possible the study of questions which were not possible before. It is now possible to predict success to a certain extent, to better classify pupils for the purpose of instruction, to give vocational and educational guidance, and to make valuable comparisons from these data. These tests have also proved very effective in promoting a scientific attitude in the field of education. Much light has been thrown upon the problem of curriculum construction, administration and organization of schools.

In this study the Stanford Revision of the Binet-Simon Intelligence Test has been used in measuring the intelligence of the pupils. This test is standardized as to subject matter, organization of content, methods of administration, scoring and interpretation. It is

also considered the most accurate of all intelligence tests.<sup>2</sup>

In general the intelligence test may be said to be a measuring rod by which we can determine to a satisfactory degree the native mental ability of individuals.

#### ATTENDANCE

It is a generally accepted fact that poor attendance at school results in poor marks and that good attendance usually coincides with good marks. There is a multitude of articles to be found on this subject written from general observation and everyday experience, some of which tend to discredit the commonly accepted theory while others confirm it. An extensive study was made by Carl William Ziegler of Lafayette College concerning school attendance as a factor in school progress. His conclusions follow:<sup>3</sup>

There is a noticeable positive relation between school attendance and school marks and school progress. There is also between certain groups a significant relation between attendance and home environment as well as economic status of parents of pupils.

There is no attempt made in this study to determine the causes of poor attendance, but it is used in relation

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<sup>2</sup>  
Samuel Stevens Brooks, Improving Schools by Standardized Tests, pp. 100-101.

<sup>3</sup>  
Carl William Ziegler, School Attendance as a Factor in School Progress, p. 61.

to the marks made by students who come from families of lower economic status and the marks made by those whose families are financially better off.

Charles H. Butler of the University of Missouri made a study of 23, 958 marks made over a period of five years and found that those having the least number of absences had the highest marks, and those the lowest marks the highest number of absences. His conclusions follow:<sup>4</sup>

Even this considerable mass of data does not warrant an ultimate pronouncement to the effect that absence is the sole cause, or even the main cause, of low marks nor that regular attendance will insure high marks. Many factors influence achievement and there are undoubtedly some factors, such as attitude and classification which probably influence both marks and attendance in such a way as to contribute to the relation found. Still there is a distinct and consistent tendency for low marks to be accompanied by poor attendance and vice versa.

That attendance plays an important part in school achievement as shown by teachers' marks is a generally accepted fact, and that those pupils who come from families of lower economic status have a higher number of absences. Therefore, the attendance is used as a basic factor in this study.

#### ACHIEVEMENT

The educational achievement of a student can best be defined as the progress that is made toward reaching

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<sup>4</sup> Charles H. Butler, "School Attendance, University High School, University of Missouri," School Review, April, 1936, pp. 288-90.

certain goals or objectives that have been set up as desirable attainments. These objectives are varied and therefore in measuring the progress of the student toward these goals, it is necessary to use some kind of measuring rod.

In this study, school marks or grades have been taken as the measure for school achievement. It is not the purpose of the writer to defend or criticize teachers' marks as a measure of achievement. Much has been said by our leading educators concerning the reliability of school marks as purporting to measure certain accomplishments. Regardless of what has been said and done by investigators, the teachers' marks still convey to the parent the success or failure of his child in school.

Also the development of the educational test has served to cast some doubt upon the reliability of teachers' marks. These tests are used quite extensively and no doubt are more reliable in the measurement of certain achievements than are marks that are given subjectively. We are not here concerned regarding this question, but it is a significant fact that educational achievement must be measured in terms of school marks whether determined by the subjective judgment of the teacher or by objective test.



## X ECONOMIC STATUS

There are several different levels of social and economic status. The Sim's Test of Socio-Economic Status is used quite extensively to determine the various levels for the purpose of study, and is considered reliable. For the purpose of this study the status of the two groups were determined by whether or not the families were on the relief rolls of the county. It is an evident fact that those who are on relief are on a different level of economic security than those who are not.

Studies that have been made in the field are limited and usually involve several different factors. However, one such study was made by Mary A. Murray.<sup>5</sup>

The study made was of 125 children who came from the congested district of a large city compared to a like number from the choice residential district. She drew the following conclusion: pupils of lower socio-economic status generally rate lower in achievement and intelligence than pupils of higher socio-economic standing. The Sim's test was used to determine economic status.

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5  
Mary A. Murray, A Study of the Relation of Intelligence and Achievement to the Social-Economic Status of Pupils in a Congested City Environment, Masters Thesis, New York State Teachers College, 1934.

A similar study was made by T. L. Engle with three groups of 141 pupils in each. The groups were designated as underprivileged, privileged, and random, the last being selected at random from the entire enrollment. The comparison was made as to intelligence and achievement. He concluded that the underprivileged ranked lowest of the three groups, both in intelligence and in achievement.<sup>6</sup>

In the final analysis there are many factors that play an important part in school achievement. It would be impossible to consider all of them in a study of this nature. It is possible, however, to consider a few of the most obvious. The intelligence of a pupil has a direct bearing upon his achievement and is one of the most important factors. Fortunately it can be measured to a fair degree of accuracy by any one of the various standardized intelligence tests. This makes it possible to compare the intelligence of pupils in relation to their achievement. It is a generally accepted fact, and has been proven by studies previously mentioned in this chapter, that attendance is an important factor in school achievement. Teachers' marks as a measure of achievement are open to some criticism. Nevertheless, they are still accepted by most schools as the measuring rod for promotion,

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T. L. Engle, "Home Environment and School Records," School Review, Vol. 42, October, 1934, pp. 590-592.

and therefore, are fairly representative of the pupil's achievement. That the economic status of a pupil also influences his school achievement has been pointed out. The factors that have been mentioned will be considered in the following chapter.

CHAPTER III  
THE STUDY

Before proceeding with a discussion of the problem involved it will be well to review briefly the groups considered in this study. The two groups compared will be referred to as the Relief Group and the Non-Relief Group, the former being composed of pupils who come from families that are registered on the relief rolls of Garfield County, while the latter group is composed of pupils that come from families that are not on the relief rolls. The basis for the comparison is that of school achievement as shown by teachers' marks, I. Q., and the average daily attendance. The comparison of the two groups will be made in the following order:

1. The Raw Scores as indicated by teachers' marks.
2. The Raw Scores weighted in terms of the pupils' I. Q.'s.
3. The Raw Scores weighted in terms of the pupils' attendance in days for each semester.
4. Individual comparison of pupils of approximate I. Q.'s and with an approximate chronological age.

RAW SCORES

Table II gives the raw scores for subjects taken in junior high school and were obtained in the following manner. The semester grades for each subject were

averaged and these grades were taken as raw scores and will hereafter be referred to as the raw scores for that subject. All subjects were not taken for the same number of semesters, hence a combination of subjects was made in the following cases: History and Geography; Reading, Penmanship, and Spelling were combined for the first two semesters only and the semester grades were averaged for the general average. Domestic Art and Industrial Art are under the same heading but are not combined, the former was taken by girls and the latter by boys.

Table I shows in which semester the various subjects were taken and also further explains the combinations of subjects mentioned above. It will also be observed from this table that English and Mathematics were the only subjects taken for six semesters, and that Science was taken for two semesters.

TABLE I  
SUBJECTS AND THE SEMESTER IN WHICH  
THEY WERE OFFERED

Subjects	Semesters					
	1	2	3	4	5	6
English	X	X	X	X	X	X
Mathematics	X	X	X	X	X	X
History			X	X	X	X
Geography	X	X				
Reading	X	X				
Spelling	X	X				
Penmanship	X	X				
Science			X	X		
Domestic Art (girls)			X	X	X	X
Industrial Art (boys)			X	X	X	X

Table I is interpreted in the following manner.

Pupils take English in the junior high school for the entire six semesters. Therefore, an X in each semester column adjacent to the subject of English indicates that English is a required subject for the entire six semesters. The same is true of mathematics, but in history and geography it is not true. Pupils take geography the first two semesters and take history the last four semesters. These two subjects combine to make a full three year social science course in the junior high school curriculum. The course in reading, spelling, and penmanship are taken for only two semesters each, and that for the first two semesters in the seventh grade. Science is likewise taken for only two semesters, but unlike the reading, spelling, and penmanship it is taken during the third and fourth semesters in the eighth grade. Domestic art for the girls and industrial art for the boys are taken for four semesters each during the eighth and ninth grades.

In Table II the first column is headed "Stu." and the numbers in first column used in place of the student's name. The other six columns are self-explanatory, being abbreviations for the various subjects previously mentioned (Table I). The eighth column shows the general average for all the raw scores and represents in one number the achievement for the entire three years of

junior high school work. The column headed "Attd." is the average daily attendance for each semester based upon a possible attendance of 90 days for each semester. In the final computation of the attendance less than half days were dropped and half days or over were considered as a whole day. In the ninth column the intelligence quotient was obtained from The Stanford Revision of the Binet-Simon Intelligence Test, this was previously mentioned in Chapter I. At the close of the table the standard deviation, mean, and probable error is computed for each column except the average attendance.

TABLE II

A DISTRIBUTION OF AVERAGES IN JUNIOR HIGH SCHOOL  
MARKS BY SUBJECT; ALSO GENERAL AVERAGE, I. Q.,  
AND AVERAGE ATTENDANCE MADE BY NON-RELIEF STUDENTS

Stu.	Eng.	Math.	Geog.	Read.		Dom. Gen.		I. Q.	Avg. Attd.
				Hist. Pen.	Spell.	Sci.	Art		
1	80	77	79	87	87	84	89	85	87
2	84	87	85	85	83	91	86	111	90
3	87	84	86	89	90	90	88	106	81
4	89	83	84	89	87	83	86	112	88
5	85	81	82	90	85	82	84	110	84
6	80	80	84	78	82	78	80	89	90
7	86	90	82	86	87	84	86	106	88
8	80	79	83	83	82	84	82	98	80
9	80	83	83	85	88	92	85	117	87
10	88	90	83	88	86	88	87	104	88
11	90	93	93	95	87	92	92	112	90
12	95	92	94	96	90	83	92	103	90
13	77	80	81	84	82	84	81	103	89
14	90	90	89	93	91	93	91	105	91
15	86	90	89	90	93	90	90	110	83
16	84	83	88	83	84	89	84	108	90
17	77	82	80	83	85	82	81	80	89
18	85	85	85	88	86	87	85	113	81
19	96	97	93	94	96	89	93	95	87
20	83	88	89	89	91	90	88	93	90
21	88	87	86	92	91	85	88	115	89
22	90	88	87	91	97	95	91	102	86
23	90	84	84	89	84	82	85	92	87
24	80	83	80	87	93	92	84	97	89
25	84	82	81	90	87	88	85	115	89
26	81	82	80	83	83	87	83	101	90
27	78	79	86	86	83	86	83	93	84
28	86	86	88	90	87	93	88	115	87
29	81	83	91	84	89	83	85	106	86
30	87	88	87	93	85	89	80	115	89
31	80	81	80	92	80	95	81	92	87
32	79	78	81	77	85	87	81	96	89
33	89	83	91	94	91	91	90	106	89
34	82	79	84	87	85	88	84	103	86
35	76	77	81	84	83	83	81	106	87
36	83	85	81	87	84	83	84	96	89
37	81	84	86	86	86	81	84	104	87
38	74	77	77	82	82	86	80	120	82
39	86	83	84	91	93	89	88	114	81
40	86	87	90	94	90	91	89	112	88



TABLE II (Continued)  
 A DISTRIBUTION OF AVERAGES IN JUNIOR HIGH SCHOOL  
 MARKS BY SUBJECT; ALSO GENERAL AVERAGE, I. Q.,  
 AND AVERAGE ATTENDANCE MADE BY NON-RELIEF STUDENTS

Stu.	Eng.	Math.	Geog.	Read.		Dom. Gen.		I. Q.	AVG. Attd.
				Hist.	Pen.	Sci.	Art		
41	78	78	78	82	76	78	78	94	86
42	77	74	79	83	83	76	78	106	82
43	74	78	77	85	78	81	79	91	89
44	81	85	82	93	85	86	85	101	87
45	90	91	88	91	92	80	89	104	89
46	88	90	87	94	90	90	90	100	88
47	76	73	76	82	76	77	77	102	86
48	80	77	78	75	82	77	78	101	87
49	82	83	83	89	91	87	86	101	88
50	93	93	90	95	94	90	93	113	89
51	84	80	83	94	83	84	85	108	81
52	82	86	85	82	85	83	84	99	86
53	81	87	79	88	82	88	84	109	87
54	86	92	88	86	87	89	88	110	87
55	87	86	88	88	92	89	88	106	86
56	78	80	86	84	77	83	81	98	87
57	86	92	89	89	90	91	90	98	90
58	81	81	85	83	83	85	83	103	87
59	78	86	83	84	85	88	84	103	85
60	80	76	80	86	79	82	81	100	86
61	81	81	81	81	84	85	82	101	87
62	82	89	81	83	89	87	85	107	87
63	87	84	80	91	88	86	86	97	89
64	77	75	76	87	76	82	79	107	88
65	81	83	81	91	86	83	85	140	85
66	77	80	81	85	79	85	81	103	87
67	82	82	80	80	81	88	82	116	88
68	74	79	84	83	79	78	80	100	82
69	81	79	82	89	83	86	83	98	87
70	87	88	84	89	84	92	87	102	87
71	94	92	92	96	95	90	87	103	85
72	80	81	83	92	86	83	85	95	89
73	76	81	79	77	82	83	80	92	89
74	92	91	90	94	89	89	91	114	89
75	76	76	75	81	76	79	77	79	89
76	87	88	84	91	83	89	87	104	87
77	89	85	80	86	85	85	85	92	88
78	87	84	85	90	87	82	86	126	88
79	82	78	82	85	84	83	82	95	86
80	82	77	80	88	81	84	82	100	89
81	82	82	80	87	80	87	83	96	86
82	81	80	81	91	83	93	85	95	88

TABLE II (Continued)

A DISTRIBUTION OF AVERAGES IN JUNIOR HIGH SCHOOL  
MARKS BY SUBJECT; ALSO GENERAL AVERAGE, I. Q.,  
AND AVERAGE ATTENDANCE MADE BY NON-RELIEF STUDENTS

Stu.	Eng.	Math.	Hist.	Read.		Sci.	Don. Gen.		I. Q.	AVG. Att'd.
				Pen.	Spell.		Ind.	Score		
83	91	89	85	94	90	92	90	108	90	
84	88	87	84	94	86	85	87	97	87	
85	79	91	83	80	85	85	84	82	88	
86	89	92	88	91	91	89	90	112	89	
87	91	89	90	95	88	89	90	105	89	
88	86	85	89	88	89	89	88	106	88	
89	85	87	92	88	94	87	89	100	87	
90	85	84	86	89	91	87	87	98	88	
91	80	79	81	83	82	77	80	108	88	
92	85	85	82	86	89	85	85	90	88	
93	93	90	92	95	96	88	92	100	88	
94	85	87	82	93	87	85	87	98	89	
95	87	83	85	90	85	80	85	84	89	
96	82	79	84	91	84	82	84	76	86	
97	86	84	79	89	82	82	84	90	85	
98	88	89	86	92	88	88	89	97	87	
99	94	94	95	94	98	94	95	117	89	
100	76	82	77	79	82	79	79	90	87	
101	77	81	87	85	74	82	79	93	88	
102	87	86	92	87	90	90	89	97	86	
103	87	88	87	93	91	84	90	136	88	
104	89	88	83	92	85	86	87	107	90	
105	90	93	85	90	87	86	88	106	87	
106	78	84	76	82	77	78	79	93	82	
107	82	74	74	88	91	74	81	102	84	
108	87	88	85	92	86	86	87	111	88	
109	76	78	79	89	77	75	79	104	80	
110	80	77	77	83	79	76	79	92	82	
111	86	86	79	88	87	90	86	101	88	
112	76	80	77	79	75	77	77	86	89	
113	87	87	86	92	85	88	88	108	88	
114	83	83	83	91	85	84	85	83	90	
115	84	88	86	89	88	83	86	114	89	
116	96	90	92	95	95	92	93	118	88	
117	81	78	78	87	83	76	81	120	88	
118	80	82	80	86	82	88	82	100	89	
119	80	84	77	81	77	81	80	92	83	
120	77	77	81	82	78	80	79	88	87	
121	80	81	82	88	83	86	83	107	90	
122	82	85	85	85	84	83	84	90	88	
123	82	84	78	83	80	83	82	102	88	

TABLE II (Continued)

A DISTRIBUTION OF AVERAGES IN JUNIOR HIGH SCHOOL  
MARKS BY SUBJECT; ALSO GENERAL AVERAGE, I. Q.,  
AND AVERAGE ATTENDANCE MADE BY NON-RELIEF STUDENTS

Stu.	Eng.	Math.	Hist. Geog.	Read. Pen. Spell.	Sci.	Dom. Ind. Art	Gen. Score Avg.	I. Q.	Avg. Att'd.
124	89	84	88	95	93	90	90	105	90
125	88	83	84	92	88	89	88	98	86
126	91	87	87	91	94	95	91	100	88
127	88	84	83	91	87	84	86	90	86
128	84	85	84	91	87	88	87	99	89
129	83	86	87	90	89	90	88	83	87
130	85	83	82	89	85	83	85	99	90
131	85	83	82	88	84	90	85	101	88
132	81	81	81	89	81	84	85	103	82
133	93	93	92	95	96	93	94	85	89
134	78	79	77	85	75	80	79	102	84
135	86	85	87	89	90	90	88	109	87
136	90	91	82	90	85	85	87	103	89
137	97	96	95	94	98	96	96	114	85
138	78	77	78	86	81	80	80	107	82
139	76	81	82	87	75	82	81	100	84
140	86	85	87	92	83	88	87	98	87
141	90	87	84	92	86	90	88	101	90
142	80	85	81	89	83	91	85	111	85
143	76	77	80	83	83	85	79	113	84
144	74	78	78	81	87	74	79	105	84
145	94	92	91	94	95	92	93	107	89
146	87	88	85	90	87	90	88	105	88
147	86	89	88	92	90	88	89	105	88
148	80	81	87	85	87	81	83	108	90
149	78	78	77	84	76	84	79	91	89
150	74	72	77	79	81	80	77	80	88
151	87	86	79	92	80	88	85	119	89
152	83	84	83	88	86	85	85	103	83
153	75	84	81	83	84	82	82	101	87
154	90	90	87	92	90	85	89	113	89
155	92	94	88	95	91	90	92	110	85
156	88	88	88	88	91	86	88	97	89
157	88	79	77	87	84	86	84	109	87
158	92	87	88	92	91	89	90	116	88
159	79	73	75	85	75	89	79	104	83
160	82	81	81	91	83	86	86	104	81
Mean	84.45	84.6	84.15	88.35	85.95	86	85.35	102.2	XX
S. D.	5.45	5.2	3.7	4.7	5.6	4.7	4.45	10.15	XX
P. E.	.29	.27	.19	.25	.30	.25	.23	.54	XX

Table II is interpreted in the following manner.

Pupil 1 has the score indicated by the number under the various subject headings, and likewise his average score for all these subjects is given in the appropriate column under general score average. His intelligence quotient is 85 and he has an average attendance of 87 days out of a possible 90 days. There were 160 pupils in this group who were Non-Relief pupils. The mean, standard deviation and probable error of each column are given at the end of Table II, except that of attendance. These are summarized in Table V.

#### RAW SCORES FOR RELIEF GROUP

The scores for Table III, which follows, were secured in exactly the same way as those for Table II, and are to be interpreted in exactly the same way. The only difference between the two groups is the number of pupils. In the Non-Relief group there were 160 pupils while in the Relief group there were only 27 pupils.

TABLE III

A DISTRIBUTION OF AVERAGES IN JUNIOR HIGH SCHOOL MARKS BY SUBJECT; ALSO GENERAL AVERAGE, I. Q., AND AVERAGE ATTENDANCE MADE BY RELIEF PUPILS

Stu.	Eng.	Math.	Geog.	Hist.	Pen.	Read. Spell.	Sci.	Dom. Ind.	Art	Gen. Score Avg.	I. Q.	Avg. attd.
1	77	82	79	91	80	85	82	93	85			
2	84	88	85	91	88	87	87	83	88			
3	83	82	80	88	84	82	82	83	80			
4	82	83	80	86	80	83	82	108	84			
5	77	76	77	77	75	82	77	86	86			
6	80	81	82	88	82	87	83	97	80			
7	82	79	79	84	79	79	80	109	82			
8	77	76	79	76	79	79	78	82	80			
9	77	77	79	79	82	77	79	85	80			
10	88	87	83	91	85	85	87	93	84			
11	86	83	87	87	78	79	83	98	80			
12	83	82	79	89	77	78	81	87	85			
13	80	80	82	85	84	78	81	80	83			
14	87	86	86	84	81	83	85	104	83			
15	88	87	85	89	78	92	87	96	87			
16	78	75	79	81	85	77	79	89	87			
17	87	85	88	92	84	85	87	93	85			
18	88	86	90	91	88	92	89	95	87			
19	85	79	81	86	79	80	82	107	79			
20	87	81	81	88	83	83	84	95	82			
21	84	85	80	84	79	80	82	108	88			
22	87	84	86	91	75	82	84	89	85			
23	77	77	79	78	77	77	78	76	85			
24	89	86	85	89	82	87	86	116	86			
25	86	84	85	88	86	81	84	88	80			
26	88	82	81	86	84	81	84	90	83			
27	78	79	82	81	76	78	81	75	75			
Mean	84.25	82.15	82.4	86.65	81.65	82.75	83.5	95.7	KX			
S. D.	4.45	4.5	3.65	4.9	4.5	4.45	5.3	10.75	KX			
P. E.	.59	.58	.47	.62	.58	.57	.43	1.2				

Table III is very similar to the preceding table (II) and is read and interpreted in the same manner. This table (III) gives the same information for the Relief group that the preceding table gave for the Non-Relief group. The column headings are self-explanatory and at the end

of each column the standard deviation, mean, and probable error is given, except for the average attendance column.

#### COMPARISON OF RAW SCORES

Table IV, which follows, is used for the purpose of comparing the raw scores of the two groups. This table contains the standard deviation, mean, and probable error for each subject and also the same for the intelligence quotient and general score average. These are given for both groups and arranged in such a manner that they can be easily compared.

TABLE IV  
THREE YEAR AVERAGE SCORE MADE BY NON-RELIEF AND  
RELIEF GROUPS IN TERMS OF STANDARD DEVIATION,  
MEAN, AND PROBABLE ERROR

	Non-Relief			Relief		
	Mean	S. D.	P. E.	Mean	S. D.	P. E.
I. Q.	102.9	10.15	.54	95.7	10.75	1.2
English	84.45	5.45	.29	84.25	4.45	.59
Mathematics	84.6	5.2	.27	82.24	4.5	.58
History						
Geography	84.15	3.7	.19	82.45	3.65	.47
Reading						
Penmanship	88.35	4.7	.25	86.65	4.9	.62
Spelling						
Science	85.95	5.6	.30	81.65	4.5	.58
Domestic Art	86.	4.7	.25	82.75	4.45	.57
Industrial Art						
Score Average	85.55	4.45	.23	83.5	3.3	.43

This table (IV) makes a comparison of the raw scores of the two groups in terms of the mean, standard deviation and probable error. It will be readily observed that the Non-Relief group had a mean intelligent quotient of 102.9, which is to be compared with the same mean for the Relief group, which is 95.7. The difference between the groups in the mean of their intelligence scores is 7.2, the S. D. and the P. E. can be compared in a similar way.

In making these comparisons it will be noted that the mean of the Non-Relief group exceeds that of the Relief group in every subject, however the difference is very small. The former group also exceeds in I. Q. and general score average. In English the Relief group is exceeded by only .2, which is the smallest of all the subjects. The greatest difference is in the subject of mathematics, which is 2.45. The difference of the general average score is 1.8. The standard deviations of the two groups when compared show that the Non-Relief group is more variable in every respect than the Relief group. The difference between the standard deviation in score average is 1.15. The probable error for the Relief group is the larger, for the score average it is larger by .2.

Although the Non-Relief group exceeds the Relief group in every respect the margin is not great enough to

warrant the conclusion that there is a marked difference between the two groups.

#### RAW SCORES WEIGHTED IN TERMS OF THE I. Q.

The scores given in Tables II and III are weighted in terms of the pupil's I. Q. The I. Q. is given for each pupil under the appropriate column.

The weighted scores were obtained by taking 100 as the average or normal I. Q. The raw score was divided by the I. Q. and the result, or weighted score, was given for each subject. It will be readily observed that any pupil with an I. Q. above 100 will receive a smaller score, while those with less than 100 will receive higher scores after they are weighted. Thus the two groups are given the same I. Q. advantages in terms of weighted scores.

Table V gives the weighted scores by subject for the Non-Relief group. At the end of the column the mean, standard deviation, and probable error is given for the respective subjects. This table (V) is similar to Table II, except the scores have been weighted in terms of the pupil's I. Q.



TABLE V

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE PUPIL'S I. Q.

Stu.	Eng.	Math	Read.			Dom.	Gen.	I. Q.	Avg. Att'd.
			Hist. Geog.	Pen. Spell.	Sci.	Ind. Art	Score Avg.		
1	94	90	93	102	102	99	97	95	87
2	75	79	76	76	74	81	77	111	77
3	83	79	81	83	84	84	82	106	81
4	79	74	75	79	77	74	76	112	88
5	77	73	74	81	77	74	76	110	89
6	89	89	84	87	82	87	86	89	90
7	81	84	77	81	83	79	81	106	88
8	81	80	84	84	83	85	83	98	80
9	68	70	70	72	75	78	72	116	87
10	85	87	80	85	83	85	84	104	88
11	80	83	83	85	78	82	82	112	90
12	92	89	91	93	87	81	89	103	90
13	75	78	79	82	80	82	79	103	89
14	86	86	85	89	87	89	87	105	84
15	78	82	81	82	85	82	82	110	83
16	78	77	82	77	78	82	79	103	90
17	91	103	100	104	106	103	101	80	89
18	75	75	75	78	76	77	76	113	81
19	101	101	98	99	101	94	99	95	87
20	89	95	96	96	98	97	95	93	90
21	77	76	75	80	79	74	77	115	89
22	88	86	85	89	95	93	89	102	86
23	98	91	91	96	91	89	93	92	87
24	82	86	82	90	86	95	87	97	89
25	73	71	70	73	76	77	74	115	89
26	80	81	79	82	82	86	82	101	90
27	84	85	93	93	89	93	90	93	84
28	75	75	77	78	76	81	77	115	87
29	76	78	86	79	84	78	80	106	86
30	76	77	76	81	74	77	77	115	89
31	87	88	87	89	87	93	88	92	87
32	82	81	84	80	89	91	85	96	89
33	84	78	86	89	86	86	85	106	89
34	80	77	82	84	83	85	82	103	86
35	72	73	76	79	78	78	76	106	87
36	89	89	84	91	88	87	88	96	89
37	77	81	83	83	83	77	81	104	87
38	62	64	64	68	68	72	66	120	82
39	75	73	74	79	82	78	77	114	81
40	77	78	80	84	80	81	80	112	88
41	83	83	83	87	81	83	83	94	86
42	73	69	75	78	64	72	72	106	82

TABLE V (continued)

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE PUPIL'S I. Q.

Stu.	Eng.	Math	Hist. Geog.	Read.		Dom. Ind. Art	Gen. Score	I. Q.	Avg. Attd.
				Pen.	Sci.				
43	81	86	85	93	86	90	87	91	89
44	80	84	81	92	84	85	84	101	87
45	87	88	85	88	89	88	88	104	89
46	88	90	87	94	90	90	90	100	88
47	75	71	75	80	75	76	75	102	86
48	79	76	77	74	81	76	77	101	87
49	81	82	82	88	91	86	85	101	88
50	82	82	80	84	83	80	82	113	89
51	78	74	77	83	77	78	77	108	81
52	83	87	86	83	87	84	85	99	86
53	74	80	72	81	75	81	77	109	87
54	78	84	80	78	79	81	80	110	87
55	83	81	83	83	86	83	83	106	86
56	83	86	92	90	82	89	87	93	87
57	87	93	90	90	91	92	91	98	90
58	79	79	83	81	81	83	81	105	87
59	76	84	81	82	83	85	82	103	85
60	80	76	80	86	79	82	81	100	86
61	80	80	80	80	83	84	81	101	87
62	86	83	75	77	83	81	81	107	87
63	89	86	82	93	90	83	88	97	89
64	71	71	71	81	71	86	75	107	88
65	57	59	57	65	61	59	60	140	85
66	74	77	78	82	76	82	78	103	87
67	70	70	68	68	69	74	69	116	88
68	74	79	84	83	79	78	81	100	82
69	82	80	83	90	84	87	84	98	87
70	85	86	82	87	82	90	85	102	87
71	92	89	89	93	92	87	90	103	83
72	84	85	87	97	90	87	88	95	89
73	82	88	86	83	89	90	86	92	89
74	81	80	79	82	79	79	80	114	89
75	96	96	95	103	96	100	98	79	89
76	84	85	81	88	80	86	86	104	87
77	97	92	87	93	92	92	92	92	88
78	69	67	67	71	69	65	68	126	88
79	86	82	86	89	88	87	86	95	86
80	82	77	80	88	81	84	82	100	89
81	85	85	83	90	83	90	86	96	86
82	85	84	85	95	87	97	89	95	88
83	84	82	78	87	83	85	83	108	90
84	90	89	86	96	96	87	89	97	87

TABLE V (continued)

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE PUPIL'S I. Q.

stu.	Eng.	Math.	Geog.	Hist.	Read. Pen. Spell.	Sci.	Dom. Ind. Art	Gen. Score AVG.	I. Q.	AVG. Attd.
85	96	110	100	97	103	103	102	82	88	
86	79	82	78	81	81	79	80	112	89	
87	86	84	85	90	83	84	85	105	89	
88	81	80	84	83	84	84	83	106	88	
89	85	87	92	83	94	87	89	100	87	
90	86	85	87	90	92	88	88	98	88	
91	74	73	75	77	76	71	74	108	88	
92	94	94	91	95	98	94	94	10	82	
93	92	90	92	95	96	88	92	100	93	
94	86	88	83	94	88	86	88	98	89	
95	103	98	100	107	100	95	100	84	89	
96	107	103	110	119	110	107	110	76	86	
97	95	93	87	98	91	91	93	90	85	
98	90	91	88	94	90	90	91	97	87	
99	80	80	81	80	93	80	81	117	89	
100	84	91	85	87	91	87	87	90	87	
101	82	86	81	91	79	87	84	93	88	
102	89	88	94	89	92	92	91	97	86	
103	63	64	63	68	66	61	64	136	88	
104	83	82	77	85	79	80	81	107	90	
105	84	87	80	84	82	81	83	106	87	
106	83	90	81	88	82	83	84	93	82	
107	80	72	72	86	89	72	78	102	84	
108	78	79	76	82	77	77	78	111	88	
109	73	75	75	85	74	72	74	104	90	
110	86	83	83	90	85	82	85	92	82	
111	85	85	78	87	86	89	85	101	88	
112	88	93	89	90	87	89	89	86	89	
113	80	80	89	85	78	81	81	108	88	
114	100	100	100	109	102	101	102	83	90	
115	73	77	76	78	77	72	73	114	89	
116	81	76	77	80	78	77	78	118	88	
117	67	65	65	72	69	63	67	120	88	
118	80	82	80	86	82	88	83	100	89	
119	86	91	83	88	83	88	87	92	83	
120	87	87	92	93	88	90	89	88	87	
121	74	75	76	82	77	80	77	107	90	
122	91	94	94	94	93	92	93	90	88	
123	80	92	76	81	78	81	80	102	88	
124	84	80	84	90	88	85	85	105	90	
125	89	84	83	93	89	90	88	98	86	
126	91	87	87	91	94	95	96	100	88	

TABLE V ( Continued)

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE PUPIL'S I. Q.

Stu.	Eng.	Math.	Read.			Dom.		AVG.	I. Q.	AVG. Attā.
			Hist.	Pen.	Spell.	Sci.	Art			
127	97	93	92	101	96	93	95	90	86	
128	84	85	84	91	87	88	87	99	89	
129	89	92	93	96	95	96	94	93	87	
130	85	83	82	89	85	83	85	99	90	
131	84	82	81	87	83	89	84	101	88	
132	78	78	78	86	78	81	80	103	82	
133	109	109	106	111	112	109	109	85	89	
134	76	77	75	83	74	78	77	102	84	
135	79	78	79	82	83	83	81	109	87	
136	87	88	80	87	83	83	84	103	89	
137	85	84	83	82	86	84	84	114	85	
138	73	72	73	80	76	75	75	107	82	
139	76	81	82	87	75	82	81	100	84	
140	88	87	89	95	86	90	89	98	87	
141	89	86	83	91	85	89	87	101	90	
142	72	77	73	80	75	82	76	111	85	
143	67	68	70	75	73	75	69	113	84	
144	70	74	74	77	82	70	74	105	84	
145	87	85	85	87	88	85	86	107	89	
146	82	83	80	85	82	85	83	105	83	
147	81	84	83	87	85	83	84	105	88	
148	75	76	81	80	81	76	78	106	90	
149	85	85	84	92	83	92	87	91	89	
150	92	90	96	89	101	100	82	80	88	
151	73	72	66	77	67	73	71	119	89	
152	79	80	79	85	82	81	81	105	88	
153	74	83	80	82	83	81	81	101	87	
154	80	80	77	81	80	85	79	113	89	
155	84	85	80	86	82	81	83	110	85	
156	90	86	90	90	83	88	86	91	89	
157	80	72	70	79	77	76	76	109	87	
158	79	75	76	79	79	77	77	116	88	
159	75	70	72	81	72	85	76	104	81	
160	78	77	77	87	79	82	80	104	81	
Mean	82.7	82.3	82.	86.8	84.45	84.78	84.05	102.9	XX	
S. D.	8.05	8.3	7.55	8.3	8.6	7.9	7.75	10.15	XX	
P. E.	.43	.44	.4	.44	.45	.42	.41	.54		

Table V gives the raw score weighted in terms of the pupil's I. Q. The score is weighted for each subject and given under the heading of the subject. At the end of each column the mean, standard deviation, and probable error for these scores is given for the various subjects. The table is similar to Table II, except the scores are weighted as explained in the introduction of the table.

Table VI, which follows, shows the raw scores in Table III, which is the Relief group, in terms of the pupil's I. Q.

TABLE VI

THE RAW SCORES OF THE RELIEF GROUP AS GIVEN IN  
TABLE III WEIGHTED IN TERMS OF THE PUPIL'S I. Q.

Stu.	Eng.	Math.	Geog.	Read.		Dom. Gen.		I. Q.	Avg. Attd.
				Hist.	Pen.	Sci.	Art		
1	78	83	80	92	81	86	83	98	85
2	101	101	106	102	110	106	105	83	88
3	100	99	96	99	101	99	99	83	88
4	76	77	74	80	74	77	76	108	84
5	90	88	90	90	87	85	91	86	86
6	82	84	85	91	85	90	86	97	80
7	75	72	72	77	72	72	73	109	82
8	94	94	96	94	96	96	95	82	80
9	93	94	96	96	100	94	96	82	80
10	95	94	89	98	81	91	93	93	84
11	88	85	89	89	80	79	85	98	80
12	95	94	91	102	89	90	94	87	85
13	100	100	104	106	105	98	102	80	83
14	84	83	83	81	78	80	82	104	88
15	92	91	89	93	82	96	92	96	87
16	88	84	89	91	96	87	89	89	87
17	94	91	95	99	90	91	93	93	85
18	93	91	95	96	93	97	94	95	87
19	80	74	76	81	74	75	77	107	79
20	92	85	81	93	87	87	88	95	82
21	78	78	74	74	73	74	74	108	88
22	98	94	97	102	84	92	95	89	85
23	101	103	104	103	101	101	102	76	85
24	77	74	73	77	71	75	75	116	86
25	100	98	99	97	100	94	98	86	80
26	98	91	90	96	93	90	93	90	83
27	104	105	109	108	115	104	108	75	75
Mean	90.75	89.65	90.5	93.85	89.2	92.8	90.9	95.7	XX
S. D.	8.6	9.35	10.05	9.4	11.5	10.75	9.15	10.75	XX
P. E.	1.11	1.21	1.29	1.22	1.49	1.4	1.4	1.24	

Table VI is to be interpreted in the same manner as Table V. The results are compared in Table VII.

The result as indicated by the mean, standard deviation and probable error of Tables V and VI are compared in Table VII. This table is a summary of the two preceding tables.

TABLE VII

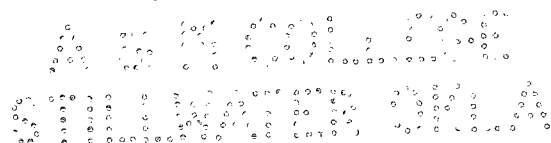
THREE-YEAR AVERAGE SCORE WEIGHTED IN TERMS OF THE  
 PUPIL'S I. Q. AND COMPARED IN TERMS OF STANDARD  
 DEVIATION, MEAN, AND PROBABLE ERROR

	Non-Relief			Relief		
	Mean	S. D.	P. E.	Mean	S. D.	P. E.
I. Q.	102.9	10.15	.54	95.7	10.75	1.2
English	82.7	8.05	.43	90.75	8.6	1.11
Mathematics	82.8	8.3	.44	89.65	9.35	1.21
History Geography	82.	7.55	.4	90.5	10.05	1.29
Reading Penmanship Spelling	86.8	8.3	.44	93.85	9.4	1.22
Science	84.45	8.6	.45	89.2	11.5	1.49
Domestic Art Industrial Art	84.78	7.9	.42	92.8	10.75	1.4
Score Average	84.05	7.75	.41	90.9	9.15	1.14

Table VII makes a comparison of the weighted scores of the two groups in terms of the mean, standard deviation and probable error.

COMPARISON OF SCORES WEIGHTED IN  
 TERMS OF PUPIL'S I. Q.

In comparing the two groups in terms of their raw score weighted with the I. Q. it is found (Table VII) that the mean score of all the subjects is higher for the Relief group than for that of the Non-Relief group. The greatest difference is noted in the subject of Reading, Penmanship, and Spelling, which are grouped together. The



difference is 9.. The least amount of difference is found between the means of the science grades, which is 5.2. The other subjects range between these two extremes. The difference in the means of the average scores is 6.8, which exceeds the difference in the comparison of raw scores by 5, but this time it is in favor of the Relief group. Considering the means as a whole the results show that when the raw scores are weighted in terms of the pupil's I. Q., the Relief group exceeds the Non-Relief group by a slightly larger margin than the Non-Relief exceeded the Relief in the comparison of raw scores. The standard deviation indicates that the Relief group is more variable than the Non-Relief. The probable error is also larger for the Relief group.

#### RAW SCORES WEIGHTED IN TERMS OF AVERAGE ATTENDANCE

The weighting of the raw scores with the attendance is very similar to that of weighting with the I. Q. The highest or best possible attendance is an average of 90 days. If the pupil is to be given the advantage of the days missed his score must be raised in proportion to the number of days missed. This is accomplished by taking the greatest possible attendance over the actual attendance and multiplying this result by the raw score. To illustrate this weighting we can take the raw score made by student number 1 in English (Table II), which is 80, and his attendance, which is 87. The highest



possible attendance of 90 is divided by 87, the actual attendance, and the result multiplied by the raw score of 80. This gives the weighted score for English, which is 83, and will be found as the score given for English in Table VIII for student number 1. Weighted scores for all subjects is given in this table and the result is summarized at the end of each column. Table VIII is for the Non-Relief.

TABLE VIII

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE ATTENDANCE

Stu.	Eng.	Math.	Read.			Dom. Ind. Art	Gen. Score		Avg. I. Q.	Avg. Attd.
			Hist.	Pen.	Sci.		Avg.	I. Q.		
1	83	80	82	82	90	90	87	85	87	
2	84	87	85	85	83	91	86	111	90	
3	97	93	96	99	100	100	97	103	81	
4	91	85	86	91	89	85	88	112	88	
5	86	82	83	91	86	82	85	110	89	
6	80	80	84	78	82	78	80	89	90	
7	88	92	84	88	89	86	108	106	88	
8	90	89	93	93	92	95	92	98	80	
9	83	86	86	88	91	95	88	117	87	
10	90	92	85	90	88	90	89	104	88	
11	90	93	93	95	87	92	92	112	90	
12	95	92	94	96	90	83	92	103	90	
13	78	81	82	85	83	85	82	103	89	
14	96	96	95	100	98	100	97	105	84	
15	93	98	96	98	101	98	97	110	83	
16	84	83	88	83	84	89	85	108	90	
17	78	83	81	84	86	83	83	80	89	
18	94	94	94	98	96	97	95	113	81	
19	99	99	96	97	99	92	97	93	87	
20	83	88	89	89	91	90	88	93	90	
21	89	88	87	93	92	86	89	115	89	
22	94	92	91	95	101	99	95	102	86	
23	93	87	87	91	87	85	88	92	87	
24	81	84	81	88	84	93	85	97	89	
25	85	85	82	91	88	89	86	115	89	
26	81	82	80	83	83	87	83	101	90	
27	84	85	92	92	89	92	89	93	84	
28	89	89	91	93	90	96	91	115	87	
29	85	87	95	89	93	87	89	106	86	
30	88	89	88	94	86	90	89	115	89	
31	83	84	83	85	83	88	84	92	87	
32	80	79	82	78	86	88	82	96	89	
33	90	84	92	95	92	92	91	106	89	
34	86	83	88	91	89	92	88	103	86	
35	79	80	84	87	86	86	84	106	87	
36	86	86	82	88	83	84	85	96	89	
37	84	87	89	89	89	87	88	104	87	
38	81	83	85	90	90	94	88	120	82	
39	96	92	93	101	103	99	98	114	81	
40	88	89	92	96	92	93	92	112	88	
41	82	82	82	86	80	82	82	94	86	
42	85	81	87	91	75	83	84	106	82	

TABLE VIII (continued)

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHED IN TERMS OF THE ATTENDANCE

Stu.	Eng.	Math.	Geog.	Read.		Dom. Ind. Art	Gen. Score	I. Q.	Attd.
				Hist.	Pen.				
43	75	79	78	86	79	82	80	91	89
44	84	88	85	96	88	89	88	101	87
45	91	92	89	92	93	92	92	104	89
46	90	92	89	96	92	92	92	100	88
47	80	77	80	86	80	81	81	102	86
48	83	80	81	78	85	80	81	101	87
49	84	83	85	91	95	89	88	101	88
50	94	94	91	96	95	91	94	113	89
51	93	89	92	104	92	93	94	108	81
52	86	90	89	86	89	87	88	99	86
53	84	90	82	91	84	91	87	109	87
54	89	95	91	89	90	92	91	110	87
55	91	90	92	92	96	93	92	106	86
56	81	83	89	87	80	86	84	93	87
57	86	92	89	89	90	91	90	98	90
58	84	84	88	86	86	88	88	103	87
59	83	91	88	89	90	93	89	103	85
60	84	80	84	90	85	86	85	100	86
61	84	84	84	84	87	88	85	101	87
62	85	92	84	86	92	90	88	107	87
63	88	85	81	92	89	87	87	97	89
64	79	78	78	89	78	84	81	107	88
65	86	88	86	96	91	88	91	140	85
66	80	83	84	88	82	88	84	103	87
67	84	84	82	82	83	90	84	116	83
68	81	87	92	91	87	86	87	100	82
69	84	82	85	92	86	89	86	98	87
70	90	91	87	92	87	95	90	102	87
71	103	100	100	104	103	98	101	103	93
72	81	82	84	93	87	84	85	95	89
73	77	82	80	78	85	84	81	92	89
74	93	92	91	95	90	90	92	114	89
75	77	77	76	82	77	80	78	79	89
76	90	91	87	94	86	92	90	104	87
77	91	87	82	88	87	87	87	92	83
78	89	86	87	92	89	84	88	126	83
79	86	82	86	89	83	87	86	95	86
80	83	78	81	89	82	85	83	100	89
81	86	86	84	91	84	91	87	96	86
82	83	82	83	93	85	95	97	95	83
83	91	89	85	94	90	82	80	103	90
84	91	90	87	97	89	88	90	97	87
85	81	93	85	82	87	87	86	83	88
86	90	93	89	92	92	90	91	112	89
87	92	90	91	96	89	90	91	105	89

TABLE VIII (continued)

THE RAW SCORES OF THE NON-BELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE ATTENDANCE

Stu.	Eng.	Math.	Hist.	Read.		Sci.	Soc.	Gen.		AVG. Attnd.
				Pen.	Spell.			Ind.	Score	
88	88	87	91	90	91	91	91	90	108	82
89	88	90	95	91	97	90	90	92	100	87
90	87	85	88	91	93	80	89	98	98	88
91	82	91	83	85	84	79	84	108	88	83
92	87	87	84	83	91	87	87	92	92	83
93	95	92	94	97	98	90	94	100	83	83
94	88	88	83	94	88	86	88	98	83	83
95	89	84	86	91	86	81	88	84	89	83
96	88	83	88	93	88	86	88	76	85	85
97	91	89	84	84	87	87	88	90	85	85
98	91	92	89	93	91	91	92	97	87	87
99	95	95	96	95	94	95	98	117	89	89
100	79	85	80	82	83	82	83	90	87	87
101	79	83	78	87	76	84	81	93	82	82
102	91	90	98	91	94	94	93	97	86	86
103	89	90	89	95	93	86	90	133	86	86
104	89	88	83	92	85	86	87	107	90	90
105	93	96	88	93	90	89	91	106	87	87
106	86	92	85	90	86	88	87	93	82	82
107	88	80	80	94	93	80	87	102	84	84
108	89	90	87	94	88	88	89	111	88	88
109	76	78	79	89	77	75	79	104	90	90
110	83	85	85	91	87	84	87	92	82	82
111	80	88	81	90	89	92	88	101	88	88
112	77	81	79	79	76	78	78	86	89	89
113	89	89	88	94	87	90	91	108	83	83
114	83	93	83	91	83	84	85	83	90	90
115	85	89	87	90	89	84	87	114	89	89
116	98	92	94	97	90	94	93	118	88	88
117	83	80	80	89	85	73	83	120	89	89
118	81	93	81	87	83	89	84	100	89	89
119	87	91	84	88	84	88	87	92	85	85
120	80	80	84	95	81	83	82	83	87	87
121	80	81	82	83	83	85	83	107	80	80
122	84	87	87	87	86	85	86	90	88	88
123	94	86	80	88	88	86	84	102	83	83
124	89	84	80	95	93	90	90	105	90	90
125	92	87	88	95	92	93	91	98	86	86
126	93	89	89	93	96	97	93	100	88	88
127	92	93	87	95	91	88	90	90	86	86
128	85	86	86	92	88	89	87	99	89	89
129	86	89	90	93	92	93	91	93	87	87
130	85	85	82	90	85	83	85	99	90	90

TABLE VIII (continued)

THE RAW SCORES OF THE NON-RELIEF GROUP AS GIVEN IN  
TABLE II WEIGHTED IN TERMS OF THE ATTENDANCE

Stu.	Eng.	Math.	Hist. Geog.	Read. Pen. Spell.	Sci.	Dom. Ind. Art	Ten. Score Avg.	I. Q.	Avg. Attd.
131	87	85	84	90	86	92	87	101	88
132	89	89	89	98	89	92	91	103	82
133	94	94	93	96	97	94	95	85	89
134	84	85	83	91	81	86	85	102	84
135	89	88	89	92	93	93	91	109	87
136	91	92	83	91	86	86	88	103	89
137	102	101	100	99	103	101	101	114	85
138	86	85	86	94	89	88	88	107	82
139	82	87	88	93	81	88	87	100	87
140	89	88	90	95	86	91	90	98	87
141	90	87	84	92	86	90	88	101	90
142	85	90	86	94	88	96	90	111	85
143	81	83	86	91	89	91	87	113	84
144	79	84	84	87	93	79	86	105	84
145	95	93	92	95	96	93	94	107	89
146	89	90	87	92	89	92	90	105	88
147	88	91	90	84	92	90	91	105	88
148	80	81	87	85	87	81	83	106	90
149	79	79	78	85	77	85	80	91	89
150	76	74	79	81	83	82	79	80	88
151	88	87	80	93	81	89	86	119	89
152	85	86	85	90	88	87	87	105	88
153	78	87	84	86	87	85	84	101	87
154	91	91	88	93	91	86	90	113	89
155	97	99	93	100	96	95	96	110	85
156	89	87	89	89	92	87	89	97	89
157	91	82	80	90	87	89	86	109	87
158	94	89	90	94	93	91	92	116	88
159	86	80	82	92	82	96	86	104	83
160	91	90	90	101	92	96	97	104	81
Mean	87.19	87.4	86.95	90.22	89.03	89.15	88.7	102.9	XX
S. D.	5.6	5.3	5.05	5.25	5.74	5.1	4.8	10.15	XX
P. E.	.29	.28	.27	.28	.3	.27	.25	.54	

The preceding table (VIII) needs very little interpretation. The scores have been weighted in terms of attendance and are found under the respective subject headings. At the end of each column the result is given in

terms of standard deviation, mean, and probable error for each subject, these are summarized in Table X.

Table IX, which follows, is similar to Table VIII in every respect, except the scores are those of the Relief group weighted in terms of attendance.

TABLE IX

THE RAW SCORES OF THE RELIEF GROUP AS GIVEN IN TABLE III WEIGHTED IN TERMS OF THE ATTENDANCE

Stu.	Eng.	Math.	Hist. Geog.	Read. Pen. Spell.	Sci.	Dom. Inc. Art	Gen. Score Avg.	I. Q.	Avg. Att'd.
1	82	87	84	96	85	80	87	98	85
2	86	90	87	95	90	89	89	83	88
3	93	92	90	92	95	92	92	83	80
4	88	89	86	92	86	89	88	108	84
5	81	80	81	81	78	86	81	86	86
6	90	91	92	99	92	98	94	97	80
7	90	87	87	92	87	87	88	109	82
8	87	86	89	86	89	89	88	82	80
9	87	87	89	89	92	87	89	82	80
10	94	93	89	98	91	91	93	93	84
11	97	93	98	98	88	87	94	98	80
12	88	87	84	94	81	83	86	87	85
13	87	87	89	92	91	85	89	80	83
14	89	88	88	86	83	85	87	104	88
15	91	90	88	92	81	95	91	96	87
16	81	78	82	84	86	80	82	89	87
17	92	90	93	97	89	90	92	93	85
18	91	89	93	94	91	95	92	95	87
19	87	90	92	98	90	91	93	107	79
20	95	89	89	97	91	91	92	92	82
21	86	87	82	86	81	82	84	108	88
22	92	89	91	96	80	87	89	89	85
23	82	83	84	83	82	82	85	76	85
24	93	90	89	93	86	91	90	113	86
25	97	95	96	93	97	91	95	86	80
26	95	89	88	93	91	88	91	90	83
27	94	95	98	97	103	94	97	75	75
Mean	90.35	88.68	89.75	91.65	89.05	89.25	90.15	95.7	XX
S.D.	4.1	3.7	4.75	4.8	5.65	4.44	3.84	10.75	XX
P.E.	.53	.46	.61	.62	.73	.58	.5	1.2	

Table IX needs very little interpretation. It is to be compared with Table VIII and is read in the same way. It contains the same information for the Relief group that Table VII contains for the Non-Relief group. The results found at the close of each table will now be compared.

COMPARISON OF RAW SCORES WEIGHTED IN TERMS  
OF ATTENDANCE

A summary of Tables VIII and IX are given in Table X. This summary is in the form of a comparison. The mean, standard deviation, and probable error for each subject is presented by groups.

TABLE X

THREE-YEAR AVERAGE SCORE WEIGHTED IN TERMS  
OF ATTENDANCE AND COMPARED BY GROUPS IN TERMS  
OF STANDARD DEVIATION, MEAN, AND PROBABLE ERROR

	Non-Relief			Relief		
	Mean	S. D.	P. E.	Mean	S. D.	P. E.
I. Q.	102.9	10.15	.54	95.7	10.75	1.2
English	87.19	5.6	.29	90.35	4.1	.53
Mathematics	87.4	5.3	.38	88.68	3.7	.48
History Geography	86.95	5.05	.27	89.75	4.75	.61
Reading Penmanship Spelling	90.22	5.25	.28	91.65	4.8	.62
Science	89.03	5.74	.3	89.05	5.65	.73
Domestic Art Industrial Art	89.15	5.1	.27	89.25	4.44	.58
Score Average	88.7	4.8	.25	90.15	3.84	.5

By comparing the means of the two groups we find that the Relief group has the higher mean in every subject. The greatest difference is in English, the means differ by 3.16. In domestic and industrial art there is only a slight difference of .1, which is the smallest of all the subjects. In mathematics there is a difference of 1.28, history 2.3, reading 1.43, science .2, score average 1.45.

The standard deviation coincides with the other comparisons. The Non-Relief group is more variable in every subject; however, there is only a slight difference in some subjects. History and geography differ by only .3 which is the smallest. The difference of the score average is .96 in terms of S. D.

Comparing the P. E. of the mean we find that the Non-Relief are slightly more reliable. The difference of the P. E. score average amounts to .33 more for the Relief than the opposite group.

The comparison indicates that there is not a marked difference between the groups when the scores are weighted in terms of attendance. The Relief group exceeds the Non-relief by about the same margin that they were exceeded in the raw scores.

#### INDIVIDUAL COMPARISONS

Each individual in the Relief group was compared with an individual of the Non-Relief group. In making this



comparison pupils were selected from the Non-Relief group whose intelligence quotient, chronological age, and attendance coincided as nearly as possible with those of the Relief group. It was impossible to find pupils that were identical in all three respects because of the small number to select from; however, there is very little difference when the individuals selected are considered as a whole. The age corresponds to the nearest birthday on September 10, 1935, the time of enrollment in the ninth grade. The individuals are compared upon the raw scores only.

The following table (XI) gives the individual comparisons in each subject, the chronological age, average attendance, I. Q. and score average. It is so arranged that the comparisons can be easily made.

TABLE XI

A COMPARISON OF RAW SCORES MADE BY SELECTED INDIVIDUALS FROM THE NON-RELIEF GROUP WITH THE RELIEF GROUP. SELECTED TO NEAREST CHRONOLOGICAL AGE, I. Q. AND ATTENDANCE

Stu.	Eng.	Math.	Geog.	Hist. Spell.	Pen. Sci.	Read. Art	Dom. Gen. Score	Avg. I.Q.	C. A. Years	Avg. Attd.
*										
140	86	85	87	92	83	88	87	98	16	87
141	77	82	79	91	80	85	82	98	17	85
*										
112	76	80	77	78	75	77	77	86	17	89
2	84	88	85	91	88	87	87	83	17	88
*										
1	80	77	79	87	87	84	82	85	16	87
3	83	82	80	82	84	82	82	83	16	80
*										
51	84	80	83	94	83	84	82	108	15	81
4	82	83	80	86	80	83	82	108	15	84
*										
6	80	80	84	78	82	78	80	89	16	90
5	77	76	77	77	77	72	77	86	17	86
*										
63	87	84	80	91	88	86	86	97	14	89
6	80	81	82	88	82	87	83	97	14	80
*										
136	86	85	86	80	90	90	88	109	15	87
7	82	79	79	84	79	79	80	109	15	82
*										
7	77	82	80	83	83	82	81	80	16	89
8	77	76	79	76	79	79	78	82	18	80
*										
85	79	91	83	80	85	85	84	82	16	88
9	77	77	79	79	82	77	79	82	16	80
*										
106	78	84	76	82	77	78	79	93	15	82
10	88	87	85	91	85	85	87	93	15	84
*										
57	87	93	80	90	91	92	91	98	16	90
11	86	86	87	87	78	77	83	98	16	80
*										
120	77	77	81	82	78	80	79	88	16	87
12	83	82	79	89	77	78	81	87	15	85
*										
150	74	72	77	79	81	80	77	80	16	88
13	80	80	82	85	84	79	81	80	15	83
*										
10	88	90	83	88	86	88	87	104	15	88
14	87	86	86	84	81	83	83	104	14	88

TABLE XI (continued)

A COMPARISON OF RAW SCORES MADE BY SELECTED INDIVIDUALS FROM THE NON-RELIEF GROUP WITH THE RELIEF GROUP. SELECTED TO NEAREST CHRONOLOGICAL AGE, I. Q. AND ATTENDANCE

Stu.	Eng.	Math.	Geog.	Hist. Pen. Spell.	Read. Sci.	Dom. Gen. Art	Ind. Score Avg.	I. Q.	C. A. Years	Avg. Attd.
*										
35	85	85	81	87	84	83	84	96	15	89
15	88	87	85	89	78	92	87	96	16	87
*										
92	85	85	82	86	89	85	85	90	16	88
16	78	75	79	81	85	77	79	89	16	87
*										
101	77	81	76	85	74	82	79	93	16	88
17	87	85	88	92	84	85	87	93	16	85
*										
19	96	96	93	94	96	89	93	95	15	87
18	88	86	90	91	88	92	89	95	16	87
*										
62	82	89	81	83	89	87	85	107	15	87
19	85	79	81	86	79	80	82	107	11	79
*										
32	79	78	81	77	85	87	81	96	16	89
20	87	81	81	88	83	83	84	95	18	92
*										
63	91	89	85	94	90	92	90	108	15	90
21	84	85	80	84	79	80	82	95	15	88
*										
97	86	84	79	89	82	82	84	90	17	86
22	87	84	86	91	75	82	84	89	14	85
*										
96	82	79	84	91	84	82	84	76	17	86
23	77	78	79	78	77	77	78	76	16	86
*										
158	92	87	88	92	91	89	90	116	15	88
24	89	86	85	89	82	87	86	116	15	86
*										
153	93	93	92	95	96	93	94	85	16	89
25	86	84	85	83	86	81	84	86	15	80
*										
122	82	85	85	85	84	83	84	90	15	88
26	88	82	81	86	84	81	84	90	15	83
*										
75	76	76	75	81	76	79	77	79	16	89
27	78	79	82	81	86	78	81	75	16	75

(\* ) Selected students from the Non-Relief group.

In reading the preceding table (XI) a direct comparison can be made of the individual scores made by the Relief group with those of individuals selected from the Non-Relief group who have practically the same I. Q., the same chronological age and attendance.

#### COMPARISON OF THE INDIVIDUAL SCORES

In order to compare the selected group with that of the Relief as a whole and not as individuals it was necessary to compute the standard deviation, mean and probable error for each subject. This computation is set out in Table XII.

TABLE XII  
COMPARISON OF THE MEAN, STANDARD DEVIATION,  
AND PROBABLE ERROR OF A GROUP SELECTED FROM  
THE NON-RELIEF WITH THOSE OF THE RELIEF GROUP

	Non-Relief			Relief		
	Mean	S. D.	P. E.	Mean	S. D.	P. E.
I. Q.	95.5	10.7	1.39	95.7	10.75	1.2
C. A. years	15.67	.72	.09	15.81	1.02	.13
English	84.05	5.6	.72	84.25	4.45	.59
Mathematics	84.8	6.3	.81	82.15	4.5	.58
History Geography	83.13	5.6	.47	82.4	3.65	.47
Reading Penmanship Spelling	86.85	5.45	.71	86.65	4.9	.62
Science	83.75	6.5	.85	81.65	4.5	.58
Domestic Art Industrial Art	82.85	8.3	1.07	82.75	4.45	.57
Score average	84.43	4.69	.61	83.5	3.3	.428

In reading Table XII the mean of each subject can be compared with that of the opposite group. The S. D. and P. E. can also be easily compared. It will be readily observed that there is only a slight difference in the mean of any of the subjects. The mean of the I. Q's differs by only 2.2, the Relief being the higher. The difference of the chronological age is .14, or slightly more than a month, the Relief being the higher. English is .2 better for the Relief, while mathematics is 2.65 higher for the selected group. In history and geography the selected group is also better by .73. The reading, penmanship and spelling is .2 higher for the selected group. Science is also better by 1.1 in the same group. The score average indicates that the Non-relief selected group is .93 better than the Relief group in the mean of all subjects. The standard deviation shows that the selected group is more variable by 1.39 as indicated by the difference in score average. The probable error, however, is larger by .18 for the selected group. In general there is only a slight difference in favor of the Non-Relief selected group. This relation corresponds very well with the other comparisons that have been set out previously in this study.

In summarizing the chapter briefly, it can be said that in the four comparisons which were made between

the two groups that there was not a marked difference. In comparing raw scores and I. Q. we find that the Non-Relief are slightly better, but when the scores are weighted with the I. Q., the difference is in favor of the Relief group; also when the raw scores are weighted with the attendance there is a slight difference in favor of the Relief group. The individual comparisons are quite as to be expected judging from the results of the previous comparisons, that is, they were almost identical in the mean of their scores for all the subjects. In all comparisons the Non-Relief group was a more representative group as noted by the P. E. and S. D.; this, however, is to be expected since this group represents a larger sampling.

## CHAPTER IV

## SUMMARY AND CONCLUSIONS

The problem of this investigation was to compare the achievement of pupils that come from families who are on the relief rolls with those who come from families who are not on the relief rolls. The detailed procedure by which the comparison was made has been described in the previous chapters. This summary will review briefly the comparisons made and a statement of the conclusions which seemed to be warranted by the findings.

1. A group of 27 pupils from families on the relief rolls were compared with a group of 160 pupils from families not on the relief rolls.
2. The achievement of the two groups was compared by teachers' marks over a three-year period.
3. The groups were given the same advantages of intelligence by properly weighting the scores.
4. Scores of both groups were also weighted in terms of the average of daily attendance.
5. A group of pupils was selected from the Non-relief group whose I. Q., average daily attendance, and chronological age were approximately the same as the I. Q., average daily attendance, and chronological age of the Relief group of pupils. These groups were also compared.

By comparing the raw scores of the Relief group with the raw scores of the Non-Relief group, several differences were found. In English the mean raw score of the Non-Relief group was .2 higher than the mean score in the same subject for the Relief group. The mean raw score of mathematics was also higher by 2.56 for the Non-Relief group. In the other subjects the mean raw scores were higher for the Non-Relief group by the following amounts: history and geography, 1.75; reading, penmanship, and spelling, 1.7; science, 4.75; domestic, and industrial art, 3.25; raw score average, 1.85. The means of the score raw averages are used to compare the two groups as a whole for all subjects. The mean of the raw score average for the Non-Relief group exceeds that of the mean for the Relief group by 1.85. The sigma difference of the raw score average is .72, which indicates that in 68 cases out of 100 the obtained difference of 1.85 will not differ by more than a plus or minus .72 from the true difference. The intelligence quotient mean is 7.2 higher for the Non-Relief than for the Relief group. By comparing the standard deviation of the raw score average for both groups, the Non-Relief is found to be more variable. The standard deviation of the score average is 1.15 greater for the latter group. The probable error of the mean for the raw score average is .2 greater for the Relief group.



This indicates that the mean of the raw score average is more reliable for the Non-Relief group than for the Relief group. In general these facts indicate that the Non-Relief group make better marks, and have higher intelligence than the Relief group. Also both are fairly representative groups.

The weighted scores of the two groups, when weighted in terms of the intelligence quotients, are found to be quite different from the raw scores. This weighting is accomplished by dividing the normal I. Q., which is considered as 100, by the I. Q. obtained from the Binet-Simon Intelligence Test. The raw score is then multiplied by this number, and the result is the weighted score. For example, a raw score of 80 made by a pupil with an I. Q. of 90, becomes 88, when weighted in terms of the intelligence of that pupil. The raw scores for all the subjects, and for all the pupils were weighted in this manner. The two groups were then compared, that is, the Relief group with the Non-Relief group. In this comparison we find that the mean weighted score of all subjects was higher for the Relief group than for the Non-Relief group. The mean weighted score for each subject was higher for the Relief group by the following amounts: English, 8.05; mathematics, 6.85; history and geography, 8.5; reading, penmanship, and spelling, 7.05; science, 4.75; domestic and industrial art, 8.02; score average,

6.85, respectively. In comparing the two groups as a whole, the weighted score average will be considered. The sigma differences of the weighted score averages is 1.86, which represents a fair degree of reliability for the difference of the means. Also the mean of the weighted score averages indicate that the Relief group, when given the advantage of equal intelligence, exceeds the Non-Relief group by a greater margin, than the latter exceeded the former in raw scores. The standard deviation for the mean of the average weighted score is greater by 1.4, for the Relief group than for the Non-Relief group. This indicates a greater variability for the Relief group. Also the probable error of the mean is greater for the same group by .73. This indicates that the mean of the Relief group is less reliable than the mean of the Non-Relief group. In general we find that when the raw scores are weighted in terms of intelligence, the Relief group makes better marks than the Non-Relief group. Also, that these marks are more variable, and less reliable, than the marks of the Non-relief group.

The raw scores were also weighted in terms of the average daily attendance, and the two groups were then compared. In weighting with the attendance, the greatest possible attendance of 90 days was divided by the actual attendance, and the raw score then multiplied by this result. In this comparison it was found that the mean

weighted score of all the subjects was higher for the Relief group than that for the Non-Relief group. The mean weighted score of all the subjects was higher for the Relief group by the following margin: English, 3.16; mathematics, 1.88; history and geography, 2.3; reading, penmanship, and spelling, 1.43; science, .02; domestic and industrial art, .1; weighted score average, 1.45. The weighted score average is used to compare the groups as a whole. The sigma difference for the means of the weighted score average is .83. This indicates that there is a fair degree of reliability in the difference of the two means. The standard deviation for the mean of the weighted score average is greater by .96 for the Non-Relief group than for the Relief group. This shows that the former group is more variable than the latter group. The probable error for the Relief group is higher by .73 than that for the Non-Relief group. Therefore, the mean of the weighted score average for the Relief group is less reliable than that for the Non-Relief group. These facts show that when the Relief group is given the equal advantage of attendance by weighting the scores this group will make better scores than the Non-Relief group.

A selected group was also compared with the Relief group. This group was selected from the Non-Relief pupils.

The pupils were selected who had approximately the same I. Q., the same average attendance, and the same chronological ages as the pupils had in the Relief group. It was therefore possible to compare scores of individuals in one group who were approximately equal in the above respects with scores of individuals of the other group. This comparison served to corroborate the first comparison of raw scores with the exception of English. The mean raw score for every subject was higher for the selected group with the exception of English. By subjects this selected group exceeded the mean raw scores of the Relief group by the following amounts: mathematics, 2.65; history and geography, .88; reading, penmanship and spelling, .2; science, 1.1; domestic and industrial art, .2; raw score average, .95. English was higher for the Relief group by .2. The difference between the mean raw scores in English might be expected. In the first comparison of raw scores it was noted that the mean raw scores for English were only slightly higher for the Non-Relief group. The probable error for the subject of English in the first comparison, indicates that there may be this difference of the mean raw score. In comparing the selected group with the Relief group, it is noted that the mean of the raw score average is higher for the selected group. The sigma difference of the means of the raw score is .73. This indicates that the

reliability is low when we consider that the obtained difference is .93. In fact, the obtained difference in 68 cases out of 100 will fall between .2 and 1.66. The standard deviation of the raw score average shows that the selected group is more variable by 1.39 than the Relief group. The probable error indicates that the selected group is less reliable. This is shown by the probable error of the selected group being greater by .19 than the probable error of the Relief group. With the exception of English, this comparison serves to corroborate the first comparison of raw scores, and the difference in the mean scores of English can be accounted for.

The findings in this study which are based upon the data collected from the graduating class of the Longfellow Junior High School (1936) seems to warrant the following conclusions:

1. The Non-Relief pupils have slightly better intelligence quotients.
2. Higher marks are made by the Non-Relief group.
3. The Relief pupils make better marks in English and lower marks in science than in any other subject.
4. Given equal intelligence the Relief group makes better marks than the Non-Relief group.

5. When given an equal advantage in school attendance the Relief group makes slightly better marks than the Non-Relief group.
6. The Non-Relief group has the more reliable scores.
7. The scores of the Non-Relief were more variable.
8. Pupils in the Relief group either work harder and achieve more or are given higher marks for an equal amount of work by the teacher.
9. It is acknowledged that the reliability of teachers' marks is not standardized, but but the marks constitute the criteria by which teachers pass judgment in promoting students in their subjects.

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