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Relationship between intelligence quotient and amount of gains made in remedial reading class.

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BOSTON UNIVERSITY
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THESIS

RELATIONSHIP BETWEEN INTELLIGENCE QUOTIENT AND AMOUNT
OF GAINS MADE IN REMEDIAL READING CLASS

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CHAPTER I - Introduction

The primary purpose of this study is to show the relationship between intelligence and the amount of gains made in remedial instruction. This study also wishes to find out if there is any significant difference in gains made by pupils of different intelligence levels after nine weeks instruction in a Remedial Reading Class; to find out if there is any significant difference in gains made by pupils of different chronological ages and mental ages.

The trend is not to admit pupils of low intelligence to remedial classes. The belief is that these pupils of low intelligence are already working up to their capacity. They will not only receive no benefits from remedial instruction, but will also prevent pupils with high intelligence, who might benefit from the class, from receiving this instruction. So before pupils are admitted to remedial classes the practice is to give them an intelligence test.

Betts¹ says,

*Remedial instruction in reading is largely for individuals with normal or superior intelligence. Only about twenty per cent of the retarded readers have below normal intelligence. Not

1. Betts, Emmett, Foundations of Reading Instruction, New York, American Book Company, 1946. pp. 242,243.

infrequently, however, individuals are referred for special help in reading when they do not have sufficient mental maturity to profit from the instruction."

However, many of our present day intelligence tests are loaded with reading material. It is only natural then that pupils who cannot read will score low on these tests.

Durrell² made a study of the influence of reading ability on intelligence measures. This is what he has to say:

"With few exceptions, group intelligence tests in common use have a preponderance of items demanding reading ability. Measures of intelligence should be largely independent of variable environmental influences. Makers of intelligent tests have apparently assumed that in a system of compulsory education all children have had equal opportunity to learn to read and that achievement in reading is in proportion to the native intellectual ability of the child."

The results of this study follows: Of the one thousand children with complete records on all tests, (reading and intelligence) 28.7 per cent were found to have reading ages one year or more above their Stanford-Binet mental age, 15.2 per cent had reading ages within one year or more below their Stanford Binet mental ages, and the remainder, 51.1 per cent obtained reading ages within one year of their respective mental ages. These data seem to indicate that

2. Durrell, Donald, "The Influence of Reading Ability on Intelligence Test Scores," Journal of Educational Psychology, 24:412-416, September, 1933.

reading ability and mental ability, as determined by the tests used do not show equal growth for a large proportion of the children studied.

In this study, children with superior reading accomplishment had lower IQ's than the children with low reading accomplishment. Almost every study of accomplish quotient shows that children with low IQ's achieve more than would be expected for their mental ages and that children with high IQ's usually fail to make educational ages up to their mental ages.

Durrell then compared the Binet IQ with the Haggerty Intelligence Examination. The Haggerty Delta II Intelligence Examination consists of seven tests. Six tests with a total of one hundred seventy-six items involving reading ability and one test of twenty items which demands no reading ability. The results were: IQ's derived from the Haggerty Intelligence Tests go higher or lower than the Binet IQ's as the reading accomplishment is higher or lower.

He then compared the Binet Tests with the Otis Self-Administering Intermediate Examination. The Otis Examination contains seventy five items, all of which require reading. While the difference in IQ's between the Stanford-Binet and the Otis is less than between the Stanford-Binet and the Haggerty for similar groups, the tendency

for the Otis to follow the reading achievement is marked.

In another study by Durrell³ and Harrington, Mental Maturity Versus Perception Abilities in Primary Reading, discovered that mental age had little influence on success in reading achievement. They compared two groups, a high mental age group and low mental age group. The high group had a mean mental age of eight years and nine months as compared to seven years three months for the low group; the two groups were equal in other perceptual abilities (auditory, visual, phonics); the difference of a year and a half in mental age produced only a difference of three words in reading vocabulary.

Gates⁴ says this about remedial reading:

"The phrase 'remedial instruction' implies that it is a process of teaching for the purpose of remedying some difficulty or deficiency. In current usage remedial instruction is the form of teaching undertaken to improve abilities in which diagnosis has revealed deficiency. Remedial reading is thus intended to correct demonstrated weaknesses, to remove inappropriate habits or to substitute a good technique for a poor one.

In remedial instruction individual differences in abilities and difficulties are sought

3. Durrell, Donald and Harrington, Mary, "Mental Maturity Versus Perception Abilities in Primary Reading," Journal of Educational Psychology, 46:375-380, October, 1955.

4. Gates, Arthur, The Improvement of Reading, New York: The Macmillan Company, 1947.

more extensively and thoroughly and remedial instruction consists in setting up a program to permit the maximum intensity of specialization to meet individual needs."

Harris⁵ says:

"Any child whether mentally average or feebleminded is a suitable candidate for remedial teaching when his reading age is definitely below his mental age. However, one would naturally expect a smaller average improvement.

Since reading comprehension is essentially reasoning, there is a close relationship between the intellectual ability of a person and the complexity or difficulty of the reading matter that he should be able to understand. Provided that one has used an intelligence test that is not itself dependent upon reading ability, one can estimate fairly well from the child's mental age the level of comprehension to be normally expected of him. Subtracting five years from the child's mental age gives his expected grade placement in reading comprehension."

Dolch⁶ has this to say about the causes of retardation of children in our schools today:

"The school thinks each and every child a worthwhile individual and wishes to do the very best for him. Every school in the country contains remedial cases in reading, that is, children who are not up to their capacity. In spite of the very best of teaching and supervision, there will always be cases of retardation in reading. This is because there

5. Harris, Albert, How to Increase Reading Ability, New York, Longmans, Green and Company, 1947. p. 490.

6. Dolch, Edward, A Manual of Remedial Reading, Champaign, Illinois, Garrard Press, 1945. pp. 310-315.

are certain things in children's lives that no teacher or school can control. We can only remedy their effects. Some of the causes are as follows: Absences through sickness, moving of parents, sizes of classes prevent the teacher from complete success with all pupils, bad habits of reading and unsympathetic homes.

The presence of a remedial program shows that the school seeks to give every child the best development of which he is capable."

Strang⁷ says:

"Out of present conditions, special reading groups have arisen. For one reason or another children have failed to make progress in reading in the regular classes. They become more and more retarded as they are pushed along through school, promoted by chronological age and social maturity instead of by achievement commensurate with grade standards. Schools have met this problem by forming special groups in which attention is given primarily to the improvement of reading.

Between one and two per cent of the total population are so seriously retarded that they cannot be expected to reach beyond fourth grade level of difficulty."

⁷ Strang, Ruth, "Why Special Classes For Seriously Retarded Readers?" Education, 68:604-609, June, 1948.

CHAPTER II - Review of Research

It is clear that remedial classes are needed, the causes for remedial instruction are many. Some of the studies concerning gains made under remedial reading instruction will be presented.

McCullough⁸ made a study of the Relationship Between Intelligence and Gains in Reading Ability at the Edison High School in Minneapolis.

During the second semester of the school year 1935-36 at the Edison High School in Minneapolis, a class of ninth grade students whose Kuhlmann-Anderson Intelligence Test scores indicated intelligence quotients ranging from 80 to 157, was organized for corrective work in reading comprehension. For nine weeks, from February to April, 1936 the six girls and eighteen boys met five class hours a week for corrective instruction. Different forms of the new Stanford Reading Test and the Traxler Silent Reading Test were given at the beginning and at the end of the nine weeks of training.

At the conclusion of the experiment, the average student in the group was reading 1.1 grade levels better according to these test than he had been before training. Of the group three boys had

8. McCullough, Constance, "Relationship Between Intelligence and Gains in Reading," Journal of Educational Psychology, 30:688-692, January, 1939.

reading ages which exceeded their mental ages. These boys made more than average reading gains, their improvement being more than one grade in each case. The relationship between intelligence and reading improvement on the Traxler Reading Test for the entire group of twenty-five students was .00 by the Pearson Product Moment Method of Correlation. Record of three boys whose reading age exceeded their mental age:

PUPIL	G. A.	M. A.	1st READING	MEAN IMPROVEMENT	IQ
1	14-0	15-6	15-8	1.5	111
2	14-9	13-0	13-9	2.0	88
3	15-2	13-4	13-8	1.3	88
Median for Class	14-5	15-6	13-5	1.1	105

Janes⁹ makes the following report from the school clinic which was established in Camden, New Jersey for slow learners; From June, 1949 to June, 1952 the clinic measured the reading progress of each child who had received instruction in a special class during that period, to determine what reading progress he had achieved. The following table gives a picture of those results in percentages.

9. Janes, Paul, "Is Remedial Reading Effective With Slow Learners?" The Training School Bulletin, 50:51-53, May, 1953.

YEAR	No. of Students	IQ of Average Child	% of Regression	% No. Progress	% 1-5 Months	% 6-11 Months	% 1 Grade or More
1948-49	106	70	1	17.0	17.0	23.5	41.5
1949-50	122	69	4	24.0	34.0	20.0	34.0
1950-51	146	70	2.7	2.7	29.5	18.5	46.6
1951-52	148	71	0	12.5	47.0	19.6	20.8

TABLE SHOWING NUMBER OF MONTHS OF PROGRESS MADE BY THE MEDIAN STUDENT AND THAT MADE BY THE AVERAGE OF ALL THE STUDENTS EACH YEAR

YEAR	IQ OF AVERAGE CHILD	ACHIEVEMENT OF MEDIAN CHILD	ACHIEVEMENT OF AVERAGE CHILD
1948-1949	70	9	10
1949-1950	69	10	9
1950-1951	70	6	10
1951-1952	71	4	8

These are Janes conclusions. Any remedial program for students whose average IQ is 70 must be designed to fit their special needs. In this study, the data shows that many students who entered special classes for the first time made progress beyond prognosis based upon expected maturation alone.

In a study conducted at the State Normal School,¹⁰ Oswego, New York, eleven girls and twenty-three boys made up the group of retarded cases; The Stanford-Binet Individual Intelligence Test was given to each one in the remedial reading group. For sixteen out of thirty-four cases the chronological ages exceeded the corresponding mental ages by approximately twelve months or more. Nine showed mental retardation of approximately two years or more.

According to the Terman classification thirteen (38%) of the thirty-four cases were dull or borderline in intelligence, while the remaining twenty-one (62%) were normal or above.

At the beginning of the six weeks tutoring period, the reading level of each child was secured by means of the New Stanford Achievement and the Gates Reading Tests.

In order to determine the extent of the reading retardation, the median reading age was compared with the mental age of each child. Twenty-six of the thirty-four cases showed retardation ranging from six to thirty months. On the standardized tests eight cases had mental ages in excess of their reading ages. Of these eight, six of them had IQ's below 100. The following table shows the gains made after the six weeks of extensive remedial reading.

10. "Challenging the Learner." Elementary English Review, 15: 149-158, April, 1938.

GAINS IN READING AGES

Months Gained	Number of cases	IQ of Cases
43	1	92
25	1	89
19	1	77
15	3	85, 98, 92
11	2	80, 130
9	2	82
8	1	77
7	2	103, 100
6	2	99, 89
5	6	94, 84, 72, 105, 90, 90
4	3	88, 94, 116
3	6	96, 87, 91, 102, 101, 108
2	2	82, 98
Insufficient Data	<u>2</u>	78, 117
	34	

Gains in reading ages ranges from two months to forty-three months. The IQ's ranged from 72-130. No set pattern is followed, however, one child with an IQ of 80 gained eleven months just as the child with an IQ of 130. It is probably true that everyone can improve his reading efficiency. In short, all learners can profit from systematic instruction in reading and study.

Delacato¹¹ and Delacato made the following study during a six weeks summer reading clinic at Chestnut Hill Academy, Philadelphia, Pennsylvania.

¹¹. Delacato, Janice and Delacato, Carl, "A Group Approach to Remedial Reading." Elementary English, 29:142-149, March, 1952.

The group consisted of eleven boys ranging in age from eight years and six months to thirteen years and eleven months, in grades three to eight who had been referred to a reading specialist or to a reading clinic because of reading retardation. Their IQ's ranged from 98 to 124. They were all considered educational problems by their respective public or private schools located in Philadelphia or its suburbs.

The new California Short-Form Test of Mental Maturity (Elementary 1947 S Form) and the Gates Reading Survey for grades three to ten (Form II) were administered to each boy on the first day of the session. The Gates Reading Survey for grades three to ten (Form I) was administered to each boy on the last day of the session. The table below shows the results of the remedial instruction.

GAINS IN READING SCORES

Students	C. A.	IQ	1st Reading Score	Reading Score After Course	Gains
A	13-11	93	3.6	4.6	1.0
B	13- 2	103	7.1	8.3	1.2
C	12- 9	124	7.6	8.6	1.0
D	12- 0	117	4.7	5.5	.8
E	11- 9	116	3.9	5.0	1.1
F	11- 9	104	0.0	3.0	3.0
G	11- 2	102	3.2	3.5	.3
H	10-10	99	4.4	5.0	.6
I	9- 9	108	2.5	3.8	1.3
J	9- 3	114	3.6	3.7	.1
K	8- 6	107	0.0	3.1	3.1
		Range	Median	Median	Median
		98-124	3.6	4.6	1.0

The median reading gain made by the group during the six week session was 1.0 academic year. The mean reading gain made by the group during the six weeks session was 1.2 academic year. Boys with reading problems with the etiology diagnosed as "immature" showed the least growth.

Redmount¹² wrote the following study of a summer reading clinic, at the Pennsylvania State College, School of Education, assisted by the Psychological Clinic during the summer of 1947. Twenty-four children were selected for participation in the program. All of these children were referred because of difficulty in achievement in school, primarily related to reading. They varied in age from eight to eighteen and in school grades from two to twelve. The children were given a twenty-five hour a day schedule for a period of six weeks designed to provide a program of relatively informal activities in a congenial setting.

Each child had been administered either Form M of the Stanford-Binet Intelligence Test or the Wechsler-Bellevue Intelligence Test the first week of the program. The scores for the group were varied from 70 to 124. The mean score for the group was 101 in a fairly

12. Redmount, Robert, "Description and Evaluation of A Corrective Program for Reading Disability," Journal of Educational Psychology, 39:347-358, October, 1948.

normal distribution. The Traxler, the Gates Reading Survey, the Gates Primary and the Gates Advanced Primary Tests were used in the STUDY.

An analysis of the original Rorschach records of the group reveals that two out of every three children had personality disturbances which prevented them from making an adequate adjustment to their environment.

An evaluation of changes in the reading test scores showed that forty-eight percent improved, whereas twelve percent showed lower scores. The older children tended to show greater reading improvement than the others.

Hamilton¹³ describes the program undertaken in the schools at Point Pleasant Beach, New Jersey.

Forty pupils in grades three through eight, who were reading at a level two or more years below their grade level, were given a clinical diagnosis and then divided into four groups which were given metronoscope and additional flashmeter training for four twenty-minute periods each week.

In the second week of January, shortly before the end of the first semester, different forms of the reading achievement tests

13. Hamilton, B. F., "Point Pleasant Did Something About Reading," Elementary School Journal, 45:562-568, June, 1945.

upon which the grouping for instruction in reading in September was based were administered to these children. (Grade III, Metropolitan Achievement Tests in Reading, Primary Battery III, Form B were USED; for grades IV through VIII, the Iowa Silent Reading Test, Elementary Form Bm).

A summary of the reading grade levels of the forty pupils who received clinic instruction reveals that fifteen of them, even with individual training are likely never to reach their actual grade levels in reading, that thirteen of them have made gains bringing them within a year of their normal grade level; and that twelve of them have attained their chronological reading grade level or better and will need no further clinic training.

In group one (10) all pupils were in the third grade. Age distribution was from 8-0 to 9-11, gains ranged from three months to one year seven months. In group two (8) pupils were in school grades four through seven. Age distribution was 8-9 to 14-10, results of tests show from loss of two months to gains of two years one month. Group three (12) pupils were in grades six through eight. Age distribution was from 10-8 to 14-9, gains made ranged from five months to three years four months. And group four (10) pupils were in grades seven and eight. Age distributions were from 11-8 to 16-10, results of the tests shows from loss of one

year four months to gains of two years seven months.

Bish¹⁴ reports a study made in the McKinley High School, Washington, D. C.

In the McKinley High School, Washington, D. C. the overall reading problem was studied for three years. In September, 1950 twelfth-grade pupils of average or over-average scholastic achievement were interviewed and those who were interested after hearing about the experimental class were tested with both the telebinocular and diagnostic reading tests. Fifty pupils agreed to participate in the experiment. One teacher assisted by a counselor devoted two classes to the course. Twenty-five pupils divided into two classes received nine weeks training during the first nine weeks of the semester, the remaining pupils received training for a similar period during the second half of the semester.

Class periods were of forty-five minutes' duration. Pupils were tested on speed, comprehension and vocabulary before and at the end of their training, using equivalent forms of the Diagnostic Reading Test (Survey Section). The first group of twenty-five pupils were also tested on a third equivalent form of the same test nine weeks after the completion of the training.

14. Bish, C. E., "Experiment in Reading Improvement," National Association Secondary School Principals Bulletin, 36:89-96, Jan. 1952.

The entire group of pupils participating in the experiment had a mean IQ (Otis Short Form) of 110, with a range of 96 to 133. The mean number of words per minute before training was 297 with a range of from 204 to 464. After training, the mean number of words increased to 388, with a range of from 243 to 550 words. The mean gain for the group was found to be 84 words per minute.

The results were as follows: After nine weeks, twenty-two of the twenty-five pupils showed improvement in reading rate. (6.408) There was a slight but not statistically significant loss in comprehension for the entire group. (-.483) With one exception, those who gained most had the highest reading rate at the beginning of the training. There appeared to be a slightly significant correlation (+.2054, P.E. +.0974) between gain in reading rate and intelligence, but no significant correlation between intelligence and reading rate either before or after training. There seems to be a high relationship, not verified, between emotional stability and reading rate improvement.

It is customary at the University of Minnesota to conduct a remedial reading clinic during the summer session. Bond¹⁵ and Fay give the following report:

15. Bond, G. L., and Fay, L. C., "Report of the University of Minnesota Reading Clinic." Journal of Educational Research, 43:385-390, January, 1950.

Twenty-three children, one girl and twenty-two boys were enrolled. They ranged in age from eight years to thirteen years six months, and from the first through the sixth grades in school classification. IQ's ranged from 66 to 126. The clinic was in operation two hours a day for five weeks during which time a thorough diagnosis was made of each child's difficulty and a program of remedial instruction was planned and carried out for each child.

The intellectual ability of each child was measured by the revised Stanford-Binet Form L. The Gates Primary Reading Tests were used as a measure of general reading ability, and the Gates Silent Reading Tests for the children above the third grade ability. In addition the Gates Reading Diagnostic Tests were used to analyze EACH child's specific reading skills. At the end of the five weeks a different form of the Gates tests were administered, the following table shows the actual gains in terms of school months.

<u>PUPIL</u>	<u>IQ</u>	<u>ACTUAL GAIN</u>
1	88	.90
2	108	.13
3	120	.57
4	102	.86
5	103	.42
6	99	.65
7	94	.40
8	66	.22
9	104	1.50
10	96	.23

<u>PUPIL</u>	<u>IQ</u>	<u>ACTUAL GAIN</u>
11	107	.16
12	100	.42
13	98	.01
14	104	.18
15	99	.32
16	126	.95
17	119	.20
18	83	.28
19	110	1.50
20	94	.55
21	107	.46
22	108	.32
23	95	.36
Average		<hr/> .50 or 5 months

.90 is to read as .90 of a school year or 9.0 school months.

Conway¹⁶ makes the following report taken from the files of a Remedial Reading center of a public school system.

One hundred second and third grade children were selected for remedial reading instruction on the basis of a reading test given in May, preceding instruction in the fall and a reading test given on admission. The children were taught by a remedial reading teacher for two separate hours a week and received thirty to forty hours of instruction during the year.

The reading section of the Primary I Battery, Form A of the

¹⁶. Conway, Helen, "A Study of the Relationships Between Amount of Gains Under Remedial Reading Instruction and Intelligence," Master's Thesis, Boston University, School of Education, Boston, 1943.

Metropolitan Achievement Test were administered in May preceeding instruction in the fall and the Primary II Battery, Form B of the Metropolitan Achievement Test were administered in May, at the end of the year in which instruction was given.

The Stanford Revision of the Binet Intelligence Test was administered to each of the children upon their entrance to the first grade, and given to others upon their admission to the school. The Durrell Analysis of Reading Difficulty was administered individually in October on admission and again in May when instruction was ended.

The chronological ages ranged from six years three months to ten years nine months. The mean age was eight years. The mental ages ranged from six years, four months to eleven years three months. The mean mental age was eight years, two months. The IQ's ranged from 75 to 144. The mean IQ was 103. The children below 90 consitute 19% of the group.

After instruction the amount of gains in reading ranged from one month to eighteen months. The mean gain was nine and four tenths months. Forty-six percent made over one year gains, 53% made less than one year gain and 1% made no gain. The table below shows:

Coefficient of Correlation Between Intelligence Quotients and
Amount of Gain and Mental Ages and Amount of Gain

	r	P. E. r
IQ	.14	.08
Mental Age	-.03	.06

In the fourth grade study ninety-three children with chronological ages ranged from seven years to eleven years, eleven months, with the mean age of nine years were given remedial instruction under the same conditions as above. The mental age range for this group was six years to ten years, eleven months with a mean age of eight years seven months, ten months below the mean of the chronological age. The distribution of IQ's was from 70 to 124 with a mean intelligence quotient of 95.2. Sixty percent of the children are of below average intelligence.

The amount of gain made in reading ranged from no gain to two years, four months with a mean gain of one year, three months. Ninety-two and four tenth percent made over one year gain, 6.4% made less than one year gain and 1.1% made no gain.

The correlation between the amount of gain in reading and the IQ derived from the Kuhlmann Anderson Tests of Intelligence was .24 by the Pearson Product Method of Correlation. The probable Error of the correlation was .06.

The correlation between amount of gain in reading and the

mental ages were .03 by the Pearson Product Method of Correlation. The probable error of correlation was .1.

In the last report of ninth grade pupils the majority of children had reading ages in excess of their mental ages. The chronological ages of the one hundred and thirteen children ranged from eleven years, six months to seventeen years, five months with a mean age of fourteen years, eleven months. The intelligence quotient ranged from 75 to 124. The mean intelligence quotient was 100.3. Forty-six percent of the children had IQ's below 90 and 23% had IQ's above 110. The range in gains in reading were from no months to 5 years, 1 month. The mean gain was two years, four months. Fifty-five and six tenth percent made over two years gain, 81.2% made over one year gain and 15.9% made less than one year gain.

The correlation between the amount of gain in reading and Intelligence Quotients derived from the Herman Nelson Tests of Mental Ability was .08 by the Pearson Product Method of Correlation. The probable error of the correlation was .22.

The correlation between amount of gain and mental ages was .02 by the Pearson Product Method of Correlation. The probable error of the correlation was .05.

Hester¹⁷ makes the following report of remedial instruction in

17. Hester, K. B., "Dade County Meets the Reading Problem," Elementary School Journal, 47:148-156, November, 1946.

Dade County, Florida.

In this county it was decided to test the lower third of the pupils in grades three through six in order to locate the most pressing reading problems. The Durrell Sullivan Capacity Achievement Tests were selected for screening out those children who had reading disabilities. A total of 3,907 children were tested. There were 1,274 children who were reading one year or more below grade level. Four hundred and twenty-eight registered at the Summer Reading Laboratory Schools.

Three summer reading clinics were established at strategic points in the county. The schools were in session for nine weeks from June 4 to August 3, 1945. Each class was limited to twenty children. Organization of the classes was on the basis of reading achievement rather than school grade. The classes met daily either from 8:30 to 12:30 or from 9:00 to 1:00.

At the end of the session the Durrell Sullivan Achievement Tests were administered again to determine the gains made by the children in formal reading processes. Of the 428 children who had entered 46 dropped out for various reasons. Three hundred eighty-two children remained. The gains made during the nine weeks are shown in the table below. They range from no gain to thirty months. The median gain for this period is six months.

GAINS MADE AFTER REMEDIAL INSTRUCTION

No. of Months Gained	No. of Pupils	No. of Months Gained	No. of Pupils
30	1	14	7
29		13	8
28		12	14
27		11	23
26		10	17
25	2	9	21
24		8	29
23		7	34
22	2	6	34
21	1	5	29
20	2	4	37
19	1	3	34
18	1	2	24
17	2	1	31
16	7	0	16
15	5		

After reviewing the research, most of the studies give no statistical evidence of the relationship between intelligence and the amount of gain made after remedial instruction. However, by looking at the tables which show actual gains made and the IQ's of pupils, there seems to be little relationship between the two. In the studies that present statistical evidence the correlation is very little or non-existing. In most of the studies the time limit is short and the number in the experiment is small.

In this study the relationship of amount of gains and intelligence for 1000 children will be presented. This study will try to discover if pupils of low intelligence require more time in a

remedial class to achieve their grade level than pupils of high intelligence. The relationship, if there is any will be shown between amount of gains made by boys and girls, it will try to discover if pupils with high initial reading scores require less time in a remedial class than pupils with low initial scores regardless of IQ. And finally it will try to discover whether pupils in lower or upper grades make the most gains in a certain period in a remedial reading class.

CHAPTER III - Nature and Scope of Data

This report is taken from the reports of the five remedial teachers in Roanoke, Virginia. This city has a population of around 100,000 people. There are twenty elementary schools and five remedial teachers serve these schools. A teacher remains at one school an entire year then rotates until all schools have been served. In other words, each school has the services of a remedial teacher once every four years.

Each year all pupils from grades II to VI are given the Metropolitan Achievement Test for their particular grade level. Pupils with reading grade scores six months or more below their regular class or grade level are eligible for enrollment in the remedial class.

One remedial teacher will start with pupils in the third grade who need remedial help and then go up to the next grades, another teacher might start with pupils in the sixth grade and work down. After discussing the needs of a pupil with the teacher, those with the greatest needs are selected. Each teacher usually begins with 24 pupils. They are given the following tests:

1. The California Test of Mental Maturity (Non-Language Section) to determine the mental age and IQ.
2. The California Reading Test (Primary for the third grade, elementary for the fourth, fifth, and sixth grades) to

determine the initial grade score in silent reading.

3. The Gray Oral Reading Paragraphs to determine the initial grade score in oral reading.
4. The Dolch list of 220 basic sight words to determine the number of sight words known on admission to the class.

Along with these tests, physical check-up are made, special attention is paid to emotional problems and home conditions. Pupils' eyes are tested with the telebinocular. If there is any eye defect he is referred to the nurse for a complete check and correction if needed. Each child is also given an interest inventory questionnaire and a dominance test.

After all tests have been administered the 24 pupils are divided into six classes, four in each class, according to their common needs. These classes meet for 45 minutes a day, each day in the week. At the end of this period, another form of the California Reading Test and the Gray Oral Paragraphs are administered to each pupil. Those who have progressed to their grade level are returned to their class for reading, and others with reading difficulties replace them. If a pupil is not up to his grade level according to the test results, he remains in the remedial class until such time as this is accomplished.

The following facts were taken from the records of the 1000 pupils:

1. Grade
2. Sex
3. Chronological age
4. Mental age
5. IQ
6. Initial oral reading grade
7. Initial silent reading grade
8. Length of time in class
9. Reading scores at the end of each nine weeks.

The following skills were stressed in the class:

1. Basic sight vocabulary
2. Word recognition
3. Word analysis
4. Phonics
5. Parts of book
6. Table of Contents and Index
7. Use of dictionary
8. Comprehension
9. Oral reading
10. Organization of materials

The primary purpose of this study is to show the relationship between I. Q.s and gains made in a remedial reading class.

One thousand pupils were used in this study covering a period of four years, with 200 pupils in the five remedial classes each year and fifty to a class. The time spent in the class for the 1000 pupils ranges from six weeks to one year.

The following charts show the method of analysis for the 1000 pupils in the five remedial classes regardless of length of time spent in the class. The analysis is divided into six parts: A, B, C, D, E, and F.

In Section A - Page 1 the charts show distributions of chronological ages, distributions of mental ages and distribution of I. Q.s for the one thousand pupils.

Page 2 shows the distribution of the length of time spent in the class according to grade.

Page 3 shows the distribution of initial oral reading scores and gains made by one thousand pupils.

Page 4 shows the distribution of initial silent reading scores and gains for these pupils.

Page 5 shows I. Q. and amount of gains made by 1000 pupils who spent from six weeks to one year in the remedial reading class. It also shows means, I. Q., standard deviation, standard error, possible error and correlation coefficient of these 1000 pupils.

In Section B - Page 1 shows amount of gains made according to I. Q. by the 238 third grade pupils in 9 weeks, 18, weeks, 27 weeks, and 36 weeks.

Page 2 shows the same for the 239 pupils in the fourth grade.

Page 3 shows the same for the 252 pupils in the fifth grade.

Page 4 shows the same for the 271 pupils in the sixth grade.

In Section C - the amount of gains according to I. Q. were converted to nine weeks for each of the 1000 pupils.

Page 1 shows amount of gains made by the 238 third grade pupils in nine weeks.

Page 2 shows the same for 239 pupils in the fourth grade.

Page 3 shows the same for 252 pupils in the fifth grade.

Page 4 shows the same for 271 pupils in the sixth grade.

In Section D - Page 1 shows the gains according to the 1000 pupils in grade three, four, five and six.

Page 2 shows the significant difference for gains in remedial reading instruction for different I. Q. levels after nine weeks instructions.

In Section E shows chronological ages and amount of gains made by 1000 pupils in the third, fourth, fifth and sixth grades who spent from nine weeks to one year in the remedial reading class.

Page 1 shows chronological ages and amount of gains made by 238 pupils in grade three. It also gives the mean gain for each age level.

Page 2 shows the same for 239 pupils in grade four.

Page 3 shows the same for 252 pupils in grade five.

Page 4 shows the same for 271 pupils in grade six.

Page 5 shows the chronological ages and gains made for the 1000 pupils in grade three, four, five and six combined.

Page 6 shows the significant difference for gains in remedial reading class for pupils with different chronological age level.

In Section F - Page 1 shows the mental ages and gains for the 1000 pupils who spent from nine weeks to one year in a remedial reading class.

Pages 2 and 3 shows significant difference of gains in remedial reading class for the 1000 pupils with different mental age levels.

In Section G - shows gains made in silent reading by boys and girls. It also shows the mean gain of each.

SECTION A

In Section A - Page 1 shows that the chronological ages of the 1000 pupils ranged from 8-0 to 13-0 or 8 years to 13 years. The chart is set up at three month intervals. The mean is 10-6.

The mental ages of the 1000 pupils ranged from 6-0 to 14-0 or 6 years to 14 years. The chart is set up at five month intervals. The mean is 10-2.

The I. Q. of the 1000 pupils ranged from 80 to 130. The mean is 95.27.

Page 2 shows the amount of time spent in grade three, four, five and six. It has been divided into six weeks, nine weeks, twelve weeks, eighteen weeks, twenty-four weeks, twenty-seven weeks, thirty weeks and thirty-six weeks. This chart also shows the number of pupils in each grade. At the bottom the average length of time spent in the class according to the grade is given in weeks and months.

Page 3 shows the initial oral reading scores of the 1000 pupils taken from the results of the Gray Oral Test administered at the time of entrance in the remedial reading class, and the number of pupils with each score. 1.0 means first grade, 1.2 means first grade two months, etc. It also shows the oral reading gains made by these 1000 pupils from six weeks to one year in a remedial class according to results taken from the Gray Oral Test administered at the time the pupil was returned to his or her regular class. .0 means no gains, .2 means 2 months, 3.9 means 3 years nine months.

Page 4 shows the initial silent reading scores for 1000 pupils taken from the results obtained from one form of the California Reading Test (primary for the third grade, elementary for the fourth, fifth and sixth grades) at the time of entrance in the remedial reading class. It also shows the amount of gains made by the 1000 pupils from six weeks to one year in a remedial reading class according to results taken from a different form of the California Reading Test at the time the pupil was returned to his or her regular class.

Page 5 shows the I. Q. and amount of gains in silent reading made by 1000 pupils who spent from six weeks to one year in a remedial class. At the right of the page it shows the I. Q.s ranging from 80-130. At the bottom is the amount of gains, ranging from .0 to 4.1. At the left of the page is the number of pupils with I. Q.s across and amount of gains made above each gain interval.

At the bottom of the page the means is given for the I. Q. (95.27) and gains (1.5), the standard deviation (for I. Q. 1.04, gains .6567), standard error (for I. Q. .033, gains .44) and possible error (for I. Q. .02, gains .29). The correlation coefficient is .096. According to this chart there is no relationship between I. Q. and gains made in silent reading for these 1000 pupils from six weeks to one year instruction in a remedial reading class.

CHRONOLOGICAL AGES

DISTRIBUTION OF IQs

IQ	NUMBER
128 - 130	15
125 - 127	4
122 - 124	6
119 - 121	15
116 - 118	26
113 - 115	26
110 - 112	50
107 - 109	60
104 - 106	75
101 - 103	87
98 - 100	125
95 - 97	108
92 - 94	115
89 - 91	118
86 - 88	66
83 - 85	50
80 - 82	54
TOTAL	1000

MEAN 95.27

DISTRIBUTION OF MENTAL AGES

MENTAL AGES	NUMBER
14-0 - 14-5	5
13-6 - 13-11	12
13-0 - 13-5	17
12-6 - 12-11	32
12-0 - 12-5	55
11-6 - 11-11	67
11-0 - 11-5	93
10-6 - 10-11	125
10-0 - 10-5	149
9-6 - 9-11	132
9-0 - 9-5	105
8-6 - 8-11	82
8-0 - 8-5	56
7-6 - 7-11	31
7-0 - 7-5	26
6-6 - 6-11	9
6-0 - 6-5	4
TOTAL	1000

MEAN 10-2
or
10 years and 2 months

CHRONOLOGICAL AGES	NUMBER
13-0 - 13-2	14
12-9 - 12-11	12
12-6 - 12-8	19
12-3 - 12-5	24
12-0 - 12-2	56
11-9 - 11-11	50
11-6 - 11-8	52
11-3 - 11-5	80
11-0 - 11-2	67
10-9 - 10-11	65
10-6 - 10-8	71
10-3 - 10-5	66
10-0 - 10-2	60
9-9 - 9-11	39
9-6 - 9-8	49
9-3 - 9-5	49
9-0 - 9-2	55
8-9 - 8-11	48
8-6 - 8-8	44
8-3 - 8-5	40
8-0 - 8-2	40
TOTAL	1000

MEAN 10-6 or 10yrs. six months

DISTRIBUTION OF LENGTH OF TIME SPENT
IN CLASS ACCORDING TO GRADES

GRADE	6	9	12	18	24	27	30	36	TOTAL
3	30	30	40	59	31	15	16	17	238
4	18	41	30	56	38	16	15	25	239
5	33	25	35	61	44	16	18	20	252
6	48	33	52	83	20	10	14	11	271
TOTALS	129	129	157	259	133	57	63	73	1000

GRADE 3 -- 15 Weeks or 3 Months 3 weeks
 GRADE 4 -- 16 Weeks or 4 Months
 GRADE 5 -- 16 Weeks or 4 Months
 GRADE 6 -- 14 Weeks or 3 Months 2 Weeks

 TOTAL -- 15 Weeks or 3 Months 3 Weeks

DISTRIBUTION OF
INITIAL ORAL
READING SCORES

READING SCORES	NUMBER
5.8 - 6.0	2
5.5 - 5.7	3
5.2 - 5.4	10
4.9 - 5.1	9
4.6 - 4.8	15
4.3 - 4.5	36
4.0 - 4.2	48
3.7 - 3.9	48
3.4 - 3.6	59
3.1 - 3.3	78
2.8 - 3.0	102
2.5 - 2.7	52
2.2 - 2.4	89
1.9 - 2.1	116
1.6 - 1.8	93
1.3 - 1.5	55
1.0 - 1.2	185
TOTAL	1000

MEANS 2.3
or

second grade—three months

DISTRIBUTION OF
ORAL READING GAINS

READING GAINS	NUMBER
3.9 - 4.1	20
3.6 - 3.8	35
3.3 - 3.5	40
3.0 - 3.2	70
2.7 - 2.9	53
2.4 - 2.6	103
2.1 - 2.3	117
1.8 - 2.0	144
1.5 - 1.7	115
1.2 - 1.4	115
.9 - 1.1	89
.6 - .8	59
.3 - .5	33
.0 - .2	7
TOTAL	1000

MEANS 1.97
or

one year—nine months

DISTRIBUTION OF
INITIAL SILENT
READING SCORES

INITIAL SCORES	NUMBER
5.8 - 6.0	9
5.5 - 5.7	20
5.2 - 5.4	42
4.9 - 5.1	53
4.6 - 4.8	48
4.3 - 4.5	76
4.0 - 4.2	98
3.7 - 3.9	87
3.4 - 3.6	91
3.1 - 3.3	88
2.8 - 3.0	93
2.5 - 2.7	83
2.2 - 2.4	90
1.9 - 2.1	68
1.6 - 1.8	32
1.3 - 1.5	12
1.0 - 1.2	10
TOTAL	1000

MEANS 3.5
or

third grade-fifth month

DISTRIBUTION OF
SILENT READING GAINS

SILENT READ- ING GAINS	NUMBER
3.9 - 4.1	1
3.6 - 3.8	
3.3 - 3.5	6
3.0 - 3.2	10
2.7 - 2.9	25
2.4 - 2.6	35
2.1 - 2.3	106
1.8 - 2.0	190
1.5 - 1.7	141
1.2 - 1.4	148
.9 - 1.1	179
.6 - .8	93
.3 - .5	30
.0 - .2	36
TOTAL	1000

MEANS 1.53
or

one year- five months

I. Q. AND AMOUNT OF GAINS IN SILENT READING MADE BY 1000 PUPILS WHO SPENT FROM SIX WEEKS TO ONE YEAR IN REMEDIAL READING CLASS

I. Q.															number made gains	
128-130				3	4	1	1			1	2	2			1	15
125-127	1			1		1	1									4
122-124				1		1	3			1						6
119-121			1		1	4	2		1	1	2	2	1			15
116-118	1		3	1	7	3	5		4	1		1				26
113-115		2	2	5	3	1	7		4	1		1				26
110-112		1	4	16	5	7	10		2	3	2					50
107-109	1		2	15	7	3	14		12	2	4					60
104-106	1	2	14	18	7	6	12		7	3	1	1	3			75
101-103	11	5	9	11	8	20	10		5	4	4					87
98-100	1	3	10	17	26	20	16		28		2	2				125
95-97	5	4	10	21	10	17	17		13	8	2		1			108
92-94	1	5	8	25	25	14	25		8	3	1					115
89-91	1	5	9	20	12	19	37		6	4	4	1				118
86-88	2		7	8	18	10	9		7	3	1		1			66
83-85	4	3	8	5	10	4	11		5							50
80-82	7		6	12	5	10	10		4							54
gains made	.0	.3	.6	.9	1.2	1.5	1.8		2.1	2.4	2.7	3.0	3.3	3.6	3.9	1000
	-.2	.5	.8	1.1	1.4	1.7	2.0		2.3	2.6	2.9	3.2	3.5	3.8	4.1	
.2 means 2 months gain, 4.1 means 4 years, one month gain																
	NUMBER	MEANS		S. D.		S. E.		P. E.		r						
I. Q.	1000	95.27		1.04		.033		.02		.096						
GAINS	1000	1.5		.6567		.44		.29								

SECTION B

In Section B the charts show three different factors for pupils in grades 3, 4, 5, and 6 separately. At the right of the page is the I. Q. ranging from 80-84 to 130+. In the next column each I. Q. interval has beside it a 9, 18, 27, 36, which represents 9 weeks, 18, weeks, 27 weeks, 36 weeks, telling the amount of time spent in class. At the bottom of the page are the gains ranging from 0 months to 2 years nine months. Across from each I. Q. interval on the right hand side of the page is the number of pupils with that I. Q. who made gains in 9, 18, 27, and 36 weeks. For example in part B, page 1, three pupils with an I. Q. of 80-84 made from .0-.2 (no months to two months) gains in 9 weeks, but no pupil with an I. Q. of 80-84 made between .3 to .5 (3 months to five months) gains in nine weeks. Page 1 gives the above data for grade 3, page 2 for grade 4, page 3 for grade 5 and page 4 for grade 6.

I. Q. AND AMOUNT OF GAINS MADE BY PUPILS IN 3rd GRADE IN 9 WEEKS, 18 WEEKS, 27 WEEKS, AND 36 WEEKS.

I. Q.	Time											
130+	9				1							1
	18											
	27											
	36											
125 - 129	9											
	18											
	27											
	36											
124 - 120	9				1		1					2
	18											
	27											
	36								1			1
119 - 115	9								1	1		2
	18			1					1		1	3
	27											
	36											
114 - 110	9		1		2	1			2			6
	18				1	2		1	1		1	6
	27						1	1				2
	36							1				2
109 - 105	9	1	1	2		1		1			1	7
	18			2	1	1		1	2		1	8
	27			1		1		1	1			4
	36							2				2
104 - 100	9	1		1	1	2	1			1		7
	18	1					1		1			3
	27					2	2		1			5
	36			1	2							3
99 - 95	9		1	3	4	2	1	3	2	1		17
	18		2	3	2	4	5	4	3	2		25
	27		2	2	1	3	4	2	2			16
	36			2		2		1				5
94 - 90	9		1		1	3	1					6
	18	1	1	4	13	3	5	5	4			36
	27				4	3	4		1			12
	36		2	1		2	1	2				8
89 - 85	9	2			1	1	1					5
	18		1	1				1	1		1	5
	27		1					1	1			3
	36		1		1	2	1		1			6
84 - 80	9	3		3					1			7
	18		2	2	3	3	2	1				13
	27					1		2			1	4
	36		1	1	2		1	1				6
gains made		.2-.0	.5-.3	.8-.6	1.1-.9	1.4-1.2	1.7-1.5	2.0-1.8	2.3-2.1	2.6-2.4	2.9-2.7	238

SECTION C

In Section C all gains made in grades three, four, five and six were converted into gains made in 9 weeks in each grade separately. At the right of pages 1, 2, 3, and 4 in section C are the gains (.0-.2) means between no months and 2 months gain. At the top are the different I. Q.s. On the right are the number of pupils making specific gains. Next to the bottom line is the number of pupils making various gains according to I. Q.

I. Q. AND AMOUNT OF GAINS MADE BY PUPILS IN 3rd GRADE
 IN 9 WEEKS. MEANS ALSO GIVEN.

	80	85	90	95	100	105	110	115	120	125	130+	TOTALS
	-	-	-	-	-	-	-	-	-	-	-	
	84	89	94	99	104	109	114	119	124	129		
2.7-2.9						1						1
2.4-2.6				1	1							2
2.1-2.3	1			2			2	1				6
1.8-2.0				3		1		1				5
1.5-1.7		1	1	1	1				1			5
1.2-1.4		2	3	4	2	2		1				14
.9-1.1	2	3	10	11	2	3	2	1	1		1	36
.6- .8	7	2	9	16	3	5	4					46
.3- .5	11	5	34	17	4	7	3	1	1			83
.0- .2	9	6	5	8	5	2	5					40
TOTALS	30	19	62	63	18	21	16	5	3		1	238
MEANS	.5	.5	.5	.7	.7	.8	.5	1.1	1.0		1.0	

.7 -- Average Gains
 or
 seven months

96 Average I. Q.

I. Q. AND AMOUNT OF GAINS MADE BY PUPILS IN 4th GRADE
IN 9 WEEKS. MEANS ALSO GIVEN.

	80 -84	85 -89	90 -94	95 -99	100 -104	105 -109	110 -114	115 -119	120 -124	125 -129	130+	TOTALS
2.7-2.9									1			1
2.4-2.6				1		1		1				3
2.1-2.3					1	3						4
1.8-2.0		1	1	1	1	1	1					6
1.5-1.7		2	1	3		2						8
1.2-1.4	1	2	3	2	4	1		1				14
.9-1.1	5	4	6	4	5	8	3	1			1	37
.6- .8	1	3	10	24	16	4	4	6	2	2	3	75
.3- .5	4	10	12	17	10	9	4	4	1	1		72
.0- .2	3	1	5	3	6		1					19
TOTALS	14	23	38	55	43	29	13	13	4	3	4	239
MEANS	.6	.7	.6	.7	.7	1.0	.7	.8	1.1	.6	.7	

.7 Average Gains
or

seven months

99 Average I. Q.

I. Q. AND AMOUNT OF GAINS MADE BY PUPILS IN 5th GRADE
IN 9 WEEKS. MEANS ALSO GIVEN.

	80 -	85 -	90 -	95 -	100 -	105 -	110 -	115 -	120 -	125 -	130+	TOTALS
	84	89	94	99	104	109	114	119	124	129		
3.0-3.2				1		1						2
2.7-2.9							1					1
2.4-2.6					1	2	1					4
2.1-2.3		2			1	1		1				5
1.8-2.0		1		2		2	2			2		9
1.5-1.7		2				5	1					8
1.2-1.4	1	1	3	7	1	4	2	1				20
.9-1.1	1	5	9	10	7	2		1	2			37
.6- .8	2	2	16	22	6	7	1	4	4		1	65
.3- .5	7	9	16	10	9	2	2	1	1	4		61
.0- .2	11	7	5	8	4	1	1		2	1		40
TOTALS	22	29	49	60	29	27	11	8	9	7	1	252
MEANS	.3	.8	.6	.7	.7	1.3	1.4	1.0	.6	.7	.7	

.8 Average Gains
or

eight months

98 Average I. Q.

I. Q. AND AMOUNT OF GAINS MADE BY PUPILS IN 6th GRADE
IN 9 WEEKS. MEANS ALSO GIVEN.

	80 - 84	85 - 89	90 - 94	95 - 99	100 - 104	105 - 109	110 - 114	115 - 119	120 - 124	125 - 129	130+ -	TOTALS
3.3-3.5	1											1
3.0-3.2				1								1
2.7-2.9		1	2		1							4
2.4-2.6				1		1						2
2.1-2.3	1	1	2	2	2	1			1			10
1.8-2.0	1	2	2	5	2	4		3				19
1.5-1.7		3	1		7	2				2		15
1.2-1.4	1	2		4	2	1	1	3	2			16
.9-1.1	3	4	15	13	10	6	6					57
.6- .8	7	12	14	12	14	3	2					64
.3- .5	14	7	13	9	13	6	3		1			66
.0- .2	1	3	2	4	4		1			1		16
TOTALS	29	35	51	51	55	24	13	6	4	3		271
MEANS	.5	.9	.8	.9	.9	1.1	.8	1.6	1.3	1.1		

.9 Average Gains
or

nine months

96 Average I. Q.

SECTION D

In Section D - Page 1 gains made in grades three, four, five and six were combined to show total gains for the 1000 pupils in nine weeks according to I. Q.s. The mean gain for pupils with I. Q. from 80-89 is 7 months; for pupils with I. Q. from 90-99 is 8 months; for pupils with I. Q. from 100-109 is 8 months; for pupils with I. Q. from 110-119 is 9 months; for pupils with I. Q. from 120-129 is 8 months; and the mean gain for pupils with I. Q. of 130 and over is 8 months.

Page 2 gives the means, standard deviation, standard error, difference in measurement, standard difference and critical ratio for different I. Q. for the 1000 pupils. The C. R. for pupils with I. Q. between 80-89 as compared with the next I. Q. level 90-99 is 2.00. The C. R. for pupils with I. Q. 90-99 as compared with the next I. Q. level, 100-109 is 1.60. The C. R. for pupils with I. Q. 100-109 as compared with the next I. Q. level 110-119 is 1.25.

TOTAL GAINS MADE IN 9 WEEKS ACCORDING TO I. Q'S.

Means IQ 98
Means Gains .8 or 8 months

	80 - 89	90 - 99	100 - 109	110 - 119	120 - 129	130+	TOTALS
3.3-3.5	1						1
3.0-3.2		2	1				3
2.7-2.9	1	2	2	1	1		7
2.4-2.6		3	6	2			11
2.1-2.3	5	6	9	4	1		25
1.8-2.0	5	14	11	7	2		39
1.5-1.7	8	7	17	1	3		36
1.2-1.4	10	26	17	9	2		64
.9-1.1	27	78	43	14	3	2	167
.6- .8	36	123	58	21	8	4	250
.3- .5	67	128	60	18	9		282
.0- .2	41	40	22	8	4		115
TOTALS	201	429	246	85	33	6	1000
MEANS	.7	.8	.8	.9	.8	.8	

SIGNIFICANCE OF DIFFERENCE FOR GAINS IN REMEDIAL READING INSTRUCTION
FOR DIFFERENT I. Q. LEVELS AFTER NINE WEEKS INSTRUCTION

	NUMBER	MEANS	S.D.	S.E.	DIFF.	S.E. DIFF.	C.R.
110 -							
119	85	.98	.63	.07	.10	.08	1.25
100 -							
109	246	.88	.63	.04			
100 -							
109	246	.88	.63	.04	.08	.05	1.60
90 -							
99	429	.80	.52	.03			
90 -							
99	429	.80	.52	.03	.10	.05	2.00
80 -							
89	201	.70	.56	.04			

NO SIGNIFICANT DIFFERENCE OF GAINS IN REMEDIAL CLASS FOR
PUPILS FROM ONE I. Q. LEVEL TO THE NEXT I. Q. LEVEL

SECTION E

In Section E - Pages 1, 2, 3, 4 shows the chronological ages and amount of gains made in grades three, four, five and six after instruction from six weeks to one year in a remedial reading class.

On the right of pages 1, 2, 3, and 4 the chronological ages are given. At the bottom of the chart the gains are given. Five pupils with C. A. between 8-0 and 8-2 made between no gains and 2 months gains in grade three.

At the bottom of each page the mean gain for each C. A. level is given.

Page 5 gives the chronological ages and gains made in six weeks to 1 year for the 1000 pupils in grade three, four, five and six were combined. At the right of the page the number of pupils making gains at each I. Q. level is given. At the bottom the total number of pupils making a particular gain is given. At the extreme right is the mean gain for each I. Q. level.

Page 6 gives the S. D., S. E., Diff., S. E. of Diff. and C. R. from one chronological age level to the next. Page 6 gives the standard deviation, standard error, difference, standard error of difference, and critical ratio from one chronological level to the next.

CHRONOLOGICAL AGES AND AMOUNT
OF GAINS MADE IN GRADE 3

chronological
ages

No

10-6 10-8		1									1
10-3 10-5								1			1
10-0 10-2			1								1
9-9 9-11		1	2	3			1				7
9-6 9-8	1			2		2	1				6
9-3 9-5		1	1	5	5	5	1	1		1	20
9-0 9-2	1	1	6	7	5	5	4	5			32
8-9 8-11	1	3	7	6	5	5	8	5	2	2	44
8-6 8-8		4	5	6	11	5	5	7	1		44
8-3 8-5	1	1	3	7	7	5	7	6	1	2	40
8-0 8-2	5	5	5	5	7	5	6	1		1	40
gains made	.0	.3	.6	.9	1.2	1.5	1.8	2.1	2.4	2.7	238
	-	-	-	-	-	-	-	-	-	-	
	.2	.5	.7	1.1	1.4	1.7	2.0	2.3	2.6	2.9	

Means for Chronological Age - 8-8

Means for Gains - 1.2

AGE	10-8 - 10-6	10-5 - 10-3	10-2 - 10-0	9-11 - 9-9	9-8 - 9-6	9-5 - 9-3	9-2 - 9-0	8-11 - 8-9	8-8 - 8-6	8-5 - 8-3	8-2 - 8-0
MEANS	.4	2.2	.7	1.0	1.2	1.3	1.3	1.4	1.4	1.5	1.1

CHRONOLOGICAL AGES AND AMOUNT
OF GAINS MADE IN GRADE 4

C. R.

11-6 11-8								1				1
11-3 11-5	2		1	1		2	1					7
11-0 11-2			1	2			2	1				6
10-9 10-11	2	1	4	2	3	2	2	2		1		19
10-6 10-8	4		1	8	1	2	8		2		1	27
10-3 10-5	2		1	6	6	1	3	1	2	1		23
10-0 10-2		1	2	10	5	4	3	3			1	29
9-9 9-11				5	7	5	4	9				30
9-6 9-8			3	7	6	9	13	3	1	1		43
9-3 9-5		1	2	3	7	8	1	6		1		29
9-0 9-2		1	3	3	3	1	2	3	3	1	1	21
8-9 8-11				2	1	1						4
gains made	.0 - .2	.3 - .5	.6 - .8	.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	3.0 - 3.2	239

Means for Chronological Age - 9-11

Means for Gains - 1.5

AGE	11-6 - 11-8	11-3 - 11-5	11-0 - 11-2	10-9 - 10-11	10-6 - 10-8	10-3 - 10-5	10-0 - 10-2	9-9 - 9-11	9-6 - 9-8	9-3 - 9-5	9-0 - 9-2	8-9 - 8-11
MEANS	2.2	1.0	1.5	1.2	1.4	1.4	1.4	1.6	1.6	1.5	1.7	1.2

CHRONOLOGICAL AGES AND AMOUNT
OF GAINS MADE IN GRADE 5

C. R.

12-0 12-2				2	2	3							7
11-9 11-11		2		4		2	4						12
11-6 11-8	1				3		7				1		12
11-3 11-5	2	2	3	2	4	2	10	2	2				29
11-0 11-2	1		3	1	3	4	9	5	3	1	1	1	32
10-9 10-11	4	1	5	5	5	4	9	4	2	2	1	1	43
10-6 10-8		1	3	13	4	6	7	6	2		1		43
10-3 10-5	1	1	2	12	5	7	8	2	2	1	1		42
10-0 10-2	1	2		6	2	7	7	3	1	1			30
9-9 9-11	1		1										2
gains made	.0	.3	.6	.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	
	-	-	-	-	-	-	-	-	-	-	-	-	252
	.2	.5	.7	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	

Means for Chronological Age - 10-9

Means for Gains - 1.6

AGE	12-0	11-9	11-6	11-3	11-0	10-9	10-6	10-3	10-0	9-9
	-	-	-	-	-	-	-	-	-	-
	12-2	11-11	11-8	11-5	11-2	10-11	10-8	10-5	10-2	9-11
MEANS	1.3	1.5	1.7	1.4	1.8	1.5	1.5	1.5	1.5	.4

CHRONOLOGICAL AGES AND AMOUNT
OF GAINS MADE IN GRADE 6

C. R.

13-0 13-2	2		2	2	3	3		1				1			14
12-9 12-11				1		2	7	1		1					12
12-6 12-8			1	3	2	2	6	4	1						19
12-3 12-5			3	5	5	1	7			2	1				24
12-0 12-2			3	7	7	7	12	8	2	2				1	49
11-9 11-11	1		5	7	5	10	3	5	1	1					38
11-6 11-8			2	9	7	7	7	3	2	2					39
11-3 11-5	2		10	5	5	3	8	6	2	1	1	1			44
11-0 11-2	1		1	5	7	4	6	1	2			2			29
10-9 10-11			1				1		1						3
gains made	.0	.3	.6	.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	271
	.2	.5	.8	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	

Means for Chronological Age - 11-10

Means for Gains - 1.6

AGE	13-0 -	12-9 -	12-6 -	12-3 -	12-0 -	11-9 -	11-6 -	11-3 -	11-0 -	10-9 -
	13-2	12-11	12-8	12-5	12-2	11-11	11-8	11-5	11-2	10-11
MEANS	1.2	1.9	1.6	1.5	1.7	1.4	1.6	1.5	1.6	2.2

CHRONOLOGICAL AGES AND GAINS FOR 1000 STUDENTS

Means Gain 1.5

C. A.														No.	Means	
13+	2		2	2	3	3		1					1		14	1.3
12-0																
-																
12-11			7	18	16	15	32	13	3	5	1			1	111	1.7
11-0																
-																
11-11	10	4	26	36	34	34	57	24	12	5	3	4			249	1.6
10-0																
-																
10-11	14	8	20	62	31	33	48	22	12	6	5	1			262	1.5
9-0																
-																
9-11	3	5	18	35	33	35	27	27	4	4	1				192	1.5
8-0																
-																
8-11	7	13	20	26	31	21	26	19	4	5					172	1.4
gains	.0	.3	.6	.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9		
	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	.2	.5	.8	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1		
TOTALS	36	30	93	179	148	141	190	106	35	25	10	6	1	1000		

SIGNIFICANCE OF DIFFERENCE FOR GAINS IN REMEDIAL READING
CLASS FOR DIFFERENT CHRONOLOGICAL AGE LEVELS

NO.	MEANS GAINS	S.D.	S.E.	DIFF.	S.E. DIFF.	C.R.	C. A.
14	1.3	.81	.27	.4	.29	1.3	13+
111	1.7	.6	.06				12-0 12-11
111	1.7	.6	.06	.1	.07	1.4	12-0 12-11
249	1.6	.66	.04				11-0 11-11
249	1.6	.66	.04	.1	.05	2.0	11-0 11-11
262	1.5	.69	.04				10-0 10-11
262	1.5	.69	.04	.0	0	0	10-0 10-11
192	1.5	.615	.04				9-0 9-11
192	1.5	.615	.04	.1	.06	1.6	9-0 9-11
172	1.4	.651	.05				8-0 8-11

NO SIGNIFICANCE DIFFERENCE FOR GAINS MADE IN REMEDIAL
READING CLASS FROM ONE AGE LEVEL TO THE NEXT AGE LEVEL

SECTION E

In Section F - Page 1 the mental ages and gains for the 1000 pupils who received instruction in a remedial reading class for six weeks to a year are given. At the right are the mental ages. At the bottom the gains are shown. On the right the number of pupils at different M. A. levels making a particular gain is given. Parallel to this column is the mean gain. For example, 2 pupils with a mental age between 6 years no months and 6 years 11 months made gains between six months and eight months after spending from six weeks to one year in a remedial reading class.

Page 2 and 3 shows the number of means, S. D., S. E., Diff., S. E. of Diff. and C. R. of 1000 pupils with different mental ages who spent from six weeks to one year in a remedial reading class.

MENTAL AGES AND GAINS FOR 1000 STUDENTS

M. A.															No.	Means	
14+	1					2		1	1							5	1.8
13-0																	
13-11	2		1	4	8	4	6	2	1	1						29	1.5
12-0																	
12-11	1	1	2	10	18	14	16	8	9	6	2					87	1.7
11-0																	
11-11	1	4	12	22	15	29	27	28	7	8	2	4		1		160	1.7
10-0																	
10-11	10	8	24	46	41	28	70	33	4	5	4	1				274	1.5
9-0																	
9-11	9	10	24	54	35	26	49	18	8	2	1	1				237	1.4
8-0																	
8-11	8	6	21	30	13	26	14	12	5	2	1					138	1.3
7-0																	
7-11	4	1	7	11	15	10	6	3								57	1.2
6-0																	
6-11			2	2	3	2	2	1		1						13	1.5
	.0	.3	.6	.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9			
	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1000	
	.2	.5	.8	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1			
TOTALS	36	30	93	179	148	141	190	106	35	25	10	6		1		1000	

SIGNIFICANCE OF DIFFERENCES FOR GAINS IN REMEDIAL READING

CLASS FOR 1000 PUPILS WITH DIFFERENT MENTAL AGE LEVELS

	NO.	MEANS	S.D.	S.E.M.	DIFF.	S. E. DIFF.	C.R.
13-0 -							
13-11	29	1.5	.60	.12	.2	.13	1.5
12-0 -							
12-11	87	1.7	.59	.07			
12-0 -							
12-11	87	1.7	.59	.07	0	0	0
11-0 -							
11-11	160	1.7	.69	.06			
11-0 -							
11-11	160	1.7	.69	.06	.2	.07	2.8
10-0 -							
10-11	274	1.5	.62	.04			
10-0 -							
10-11	274	1.5	.62	.04	.1	.05	2.0
9-0 -							
9-11	237	1.4	.62	.04			

	NO.	MEANS	S.D.	S.E.M.	DIFF.	S.E. DIFF.	C.R.
9-0							
-							
9-11	237	1.4	.62	.04	.1	.06	1.6
8-0							
-							
8-11	138	1.3	.65	.05			
8-0							
-							
8-11	138	1.3	.65	.05	.1	.19	.5
7-0							
-							
7-11	57	1.2	.58	.19			
7-0							
-							
7-11	57	1.2	.58	.19	.3	.20	1.5
6-0							
-							
6-11	13	1.5	.51	.07			

NO SIGNIFICANT DIFFERENCE OF GAINS IN REMEDIAL CLASS FOR
PUPILS FROM ONE MENTAL AGE LEVEL TO THE NEXT MENTAL AGE LEVEL

SECTION G

In Section G - shows gains made by boys and girls after instruction for six weeks to one year in a remedial reading class.

GAINS MADE IN SILENT READING BY BOYS AND GIRLS

GAINS	BOYS	GIRLS	TOTAL
3.9 - 4.1		1	1
3.6 - 3.8			
3.3 - 3.5	5	1	6
3.0 - 3.2	5	5	10
2.7 - 2.9	15	10	25
2.4 - 2.6	20	15	35
2.1 - 2.3	90	16	106
1.8 - 2.0	130	60	190
1.5 - 1.7	88	53	141
1.2 - 1.4	98	50	148
.9 - 1.1	114	65	179
.6 - .8	69	24	93
.3 - .5	10	20	30
.0 - .2	26	10	36
TOTALS	670	330	1000

mean gain for boys 1 year, six months

mean gain for girls 1 year, four months

CHAPTER IV - Summary

The purpose of this study is to show the relationship between intelligence and the amount of gains made by 1000 pupils after from six weeks to one year instruction in a remedial reading class. It also wishes to find out if there is any significant difference in gains made by 1000 pupils of different intelligence levels after nine weeks instruction in a remedial reading class; to find out if there is any significant difference in gains made by 1000 pupils of different chronological ages and mental ages after from six weeks to one year instruction in a remedial reading class.

According to the results of this study the relationship between gains made and intelligence for one thousand pupils after from six weeks to one year's instruction in a remedial reading class is .096.

The I. Q. and amount of gains made in 9, 18, 27, and 36 weeks for pupils in 3rd, 4th, 5th, and 6th grades were recorded. All gains were then changed to show the amount of gains all pupils made in 9 weeks according to grades, and means gains were given.

Finally, I. Q.'s and gains made in 9 weeks by 1000 pupils were combined. The mean I.Q. is 98, the mean gain .8 or 8 months.

The lowest gains, .7 or seven months were for pupils with I. Q. from 80-89. The highest gains .9 or nine months were for pupils with

I. Q.s from 110-119. Pupils with I. Q. from 90-109 means gains were the same as pupils with I. Q. from 120 - 130+, .8 or 8 months. This study shows there is no significant difference in gains made by pupils from one I. Q. level to the next I. Q. level.

The chronological ages and amount of gains made in 9, 18, 27, and 36 weeks by pupils according to grades were listed, means chronological age and means gains given. These chronological ages and gains were then combined for 1000 pupils. The means gain is 1.5 or 1 year ~~five~~^{six} months.

According to this study there is no significant difference in gains made by pupils from one chronological age level to the next chronological age level after spending from nine weeks to one year in a remedial reading class. The highest means gain, 1.7 was for pupils with ages from 12-0 to 12-11. The lowest, 1.3 was for pupils with chronological ages from 13 and above.

This study indicates there is no significant difference of gains in remedial reading class for pupils from one mental age level to the next mental age level. The highest means gain, 1.8 was for pupils with mental ages of 14 and above. The lowest means gains 1.2 was for pupils with mental ages of 7-0 to 7-11. Pupils with mental ages of 6-0 to 6-11, 10-0 to 10-11, and 12-0 to 12-11 all had mean gains of 1.5.

CHAPTER V - Suggestions For Further Study

This study seems to indicate that there is no relationship in I. Q. and amount of gains made in Remedial Reading Class for 1000 students.

For further study, it might be interesting to see how many pupils maintain ~~their~~ gains after returning to their regular class for reading instruction. Another important study would be to follow these pupils records through high school and see how many are ~~able to maintain his or her grade level throughout this period.~~

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