

READING DEFICIENCIES AMONG PUBLIC  
SCHOOL CHILDREN

by

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B. S., Kansas State College  
of Agriculture and Applied Science, 1937

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A THESIS

submitted in partial fulfillment of the

requirements for the degree of

MASTER OF SCIENCE

Department of Education

KANSAS STATE COLLEGE  
OF AGRICULTURE AND APPLIED SCIENCE

1939

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## INTRODUCTION

The initial work for this study was begun under the initiative of Dr. W. E. Sheffer, superintendent of the Manhattan schools, in the spring of 1937. After a survey of literature bearing upon reading deficiencies and a study of reading situations in other systems, Dr. Sheffer desired to determine a picture of the reading situation in the Manhattan system. Accordingly, the Board of Education provided for the purchase of testing materials.

As the writer was particularly interested in the problem of reading deficiencies, he was obligingly allowed to co-operate with the Manhattan schools, beginning with September, 1937.

In conference with Dr. Sheffer and Mr. R. W. Browning, principal of the junior high school, the following objectives were established:

1. To determine a picture of the reading situation in the Manhattan elementary schools and in the junior high.
2. To determine the students in the junior high with reading disabilities.
3. To set up experimental remedial classes for those students in the junior high especially deficient in reading abilities.

4. To establish control groups with which the remedial classes could be compared.

5. To attempt to create a reading consciousness among both teachers and students throughout the system.

#### REVIEW OF LITERATURE

Emphasis on reading instruction and remedial work in the field of reading has been increased greatly in recent years as evidenced by a study of the National Education Association on the available literature on reading instruction. The report (2, p. 277) shows an increase from eight publications during the period from 1901 to 1905 to 325 during the period from 1931 to 1935; and with only twenty-three publications prior to 1900, and 1356 since that date.

The impetus in publications in the reading field is due in part to a greater realization of deficiencies in reading which in turn can be attributed to the development of better devices to measure reading abilities. But from another angle, the impetus is due partially to the realization of the importance of reading in our changing social order. In recent years, with the development and growth of the public forum, public press and radio, together with "pressure" groups and propaganda (9, p. 87) there is an increasing need for clear thinking which is greatly enhanced by extensive reading. But from a purely

pedagogical standpoint the increase in publications is probably due to an increasing amount of research work and the demands of teachers for these results to be published in a form which is understandable to the teachers.

### Observed Conditions in the Field of Reading

Some of the research studies in the reading field have disclosed very startling results. As reported by Gates (8, p. 3) Percival found in a certain study that 99.15 per cent of the pupils failing of promotion in the first grade were marked as failures in reading. In the second grade, the percentage was about 90 and in the third grade the figure was approximately 70 per cent. For grade four, grade five, grade six, and grades seven and eight the percentages were respectively, 56, 40, 33, and 25. The consistent decline is worthy of note but is probably due to the greater role reading as a subject plays in the lower grades. It may also be due to elimination of poor readers caused by their dropping out of school or to retardation of the poor readers, that is keeping the poor readers back in the lower grades because of their deficiencies in reading.

Gray discovered (9, p. 90) in a study of 6,000 ninth grade students that 4 per cent made scores usually made by the second and third grades; that 5 per cent made scores

usually made in the fourth grade; that 7 per cent made scores comparable with sixth grade work; and that 22 per cent of the ninth grade students ranked below the seventh grade level. This is especially pertinent. As Gray points out (9, p. 93), students ranking below the seventh grade level cannot succeed in high school work.

McCallister found (16, p. 4) the following percentages of each grade ranked below the sixth grade level:

Table 1. Percentages of grades VII, VIII, and IX ranking below sixth grade level in reading tests.

	Monroe Test		Thorndike-McCall Scale
	Comprehension	Rate	Comprehension
Grade VII	44.6%	55.4%	23.1%
Grade VIII	44.8%	50.0%	31.0%
Grade IX	16.6%	46.6%	12.1%

These results show an even more serious condition than those found by Gray above.

Jacobson and Van Dusen (15, p. 143) learned that among 150 high school freshmen, 81.3 per cent were below ninth grade standards and that the median reading ability of the group was 7.1 grades.

Thompson found for the State of Montana (10, p. 503), through a questionnaire filled out by 123 administrators, that 75 per cent believed remedial reading necessary in the

freshman year of high school, and 45 per cent believed it necessary as late as the senior year.

### Reports of Remedial Treatment

With the existence of the above conditions, the question arises as to whether reading deficiencies can be corrected by remedial treatment.

Jacobson and Van Dusen (15, p. 145) retested the 102 students deficient in reading and discovered a median gain of 2.1 grades had been achieved after 23 weeks of remedial treatment. No control group was available, however, so it cannot be definitely stated that all of the gain was due to the remedial program.

Monroe and Backus reported (17, p. 101) that by remedial treatment of 137 cases of deficient readers among the 750 students in the Cooke elementary school, Washington, D. C., 31 per cent were brought up to their normal grade after 31.5 hours of remedial work covering a period of 21 weeks. On the junior high school level, remedial treatment of 23 cases over a period of fourteen weeks restored (17, p. 120) 34 per cent of the group to the normal grade level.

## Diagnosis of Reading Deficiencies

Before a remedial program can be set up a careful diagnosis must be made. Yoakam and Simpson (26, p. 453) stated:

The measurement of reading is a complex problem. Simple tests of rate and comprehension present no great difficulty, but the problem is far more complex than that. To get adequate data on the effectiveness of reading, it is necessary to measure vocabulary, comprehension, organization, retention, appreciation, and ability to solve problems through the use of printed material. ...This is most accurately done by means of well constructed standardized tests, individual laboratory tests, case studies of individuals, and free use of teacher-made objective tests.

Factors to be considered in diagnosis. Before developing a diagnostic procedure, then, what is to be looked for? Monroe and Backus suggested (17, p. 14) that diagnosis of reading disabilities should contain two types of analysis, descriptive and causative. The following is a summary of the descriptive causes (17, p. 14):

1. What reading level has the child reached? This can be answered by data from standardized tests, usually in reading grade which may vary from total non-reading to almost any grade level of reading.

2. How far below expectation is this reading level? This may be determined by comparing the reading grade with the actual grade placement, the chronological age, the

mental age, the number of years in school, and the standing in other content subjects. This relationship may be expressed as a reading index or achievement quotient.

3. Are all types of reading equally retarded? The extent of this problem can be analyzed by comparing the scores for oral and silent reading, word recognition, vocabulary, comprehension, rate of reading, etc.

4. What are the particular characteristics of the child's reading? These characteristics can be determined by analysis and description of reading errors such as eye movements, articulation and phrasing in oral reading, mannerisms and peculiarities evidenced while reading, and methods of self-help employed such as pointing, spelling, sounding, etc.

5. How does the child respond to his reading difficulty? This includes a description of the child's reaction to reading such as aggressive dislike, withdrawal, compensation, discouragement, apathy, etc.

6. What is the child like as an individual apart from reading? This element deals with personality, physical appearance, physical condition, social response, and spontaneous language and comments.

7. What have been the child's experiences? This will include a personal, social, and school history of the child

obtained from parents and former teachers, and any other available sources.

Following the descriptive factors with the causative factors contributing to reading disabilities, Monroe and Backus gave (17, p. 17) five classifications: (1) constitutional, (2) intellectual, (3) emotional, (4) educational, and (5) environmental. A summary of the causative factors follows:

1. Constitutional factors: Constitutional factors include visual defects, auditory defects, difficulties in motor control, physical defects, and debilitating factors.

a. Visual defects should be suspected from excessive reversals; excessive line, letter and word omissions, and repetitions; extremely slow rate of reading; errors in words of similar configuration; evidences of eye strain such as blinking, frowning, squinting, watering of eyes and headaches; and holding of book in unusual positions.

b. Auditory defects usually show some of the following characteristics: excessive errors in vowel and consonant sounds of words; addition and omission of sounds; speech defects in conversation and oral reading; confusion of words which sound nearly alike; inability to use phonics as an aid to word recognition; inattention while others read aloud; and misunderstanding oral directions.



c. Difficulties in motor control may originate from injuries at birth, child diseases, glandular disturbances, etc. Usually they may be detected by excessive reversals and repetitions; line skipping and losing place; erratic and impulsive behavior with frequent failure to attend to reading for more than brief periods; variations in the rate of reading; stammering during oral reading; and erratic, uncontrolled eye movements.

d. Children suffering from some debilitating physical condition lack the physical stamina to do good work. Absences from school are more noticeable. Usually the following characteristics show up: inability to concentrate on reading; apathetic, listless behavior, yawning, fatigue, and sleepiness; irritability, hyperactivity, and nervousness.

2. Intellectual factors: Reading tests usually correlate fairly highly with intelligence tests and students who are retarded in intelligence are usually similarly retarded in reading. Intellectual factors may be divided into two groups, general intelligence, and specific intellectual abilities.

a. Children with generally low intelligence usually evidence reading achievements at the same level as mental ages, and also poor comprehension in content subjects, while scores in mechanics of reading, oral reading and word

recognition are usually higher than for silent reading. Usually they are more successful in routine work than in reading for comprehension, and are no more sensitive to retardation in reading than in other subjects.

b. Children with good intelligence sometimes show retardation in certain specific elements of reading. These are noticeable when vocabulary scores on the Stanford-Binet intelligence test fall below the mental age level; the child makes absurd guesses at meanings of words in context material; fragmentary sentences are used in conversation; and higher mental ages are earned on the Grace Arthur Point Performance test than on the Stanford-Binet test. Peculiarities in modes of thought are evidenced when the child fails to succeed on tests involving forms, auditory memory, sentence repeating, etc.; when peculiarities are observed during reading such as tracing over a letter to identify it, roundabout methods of attacking words by writing or spelling, or hunting for peculiar mnemonic cues.

3. Emotional factors: Emotional factors may be divided into three classes, primary, secondary, and conditioned responses.

a. Primary factors precede the reading disability and will include general emotional immaturity, excessive timidity, predilection against reading, and predilection

against all school activities including reading. The predilections may come from unfavorable attitudes toward school created by parents, associates and others.

b. Secondary factors, which are a direct result of the child's reading disability, can be recognized as aggressive opposition and hatred of reading; withdrawal or escape which may be truancy or simply daydreaming; compensation, by turning to something more to the child's liking such as arithmetic or drawing; defeatism, when the child gives up and considers himself too "dumb" to learn; and finally, hypertension--the child is on edge and exhibits nervous mannerisms.

c. Conditioned responses occur when the child associates reading with punishment and fear of the teacher, both of which cause negative reactions.

4. Educational factors: Many of the above factors could be classed as educational but those which lend themselves to no other classification are: deficiencies in reading readiness; poor adaptation of materials to the present level of reading; poor adjustment of teaching methods to individual differences; inadequate motivation; and inadequate administrative arrangements for handling cases of reading deficiency.

a. Lack of reading readiness is evidenced by the following: a mental age less than six at the time of

entering school; speech defects in the first grade; no kindergarten training; low scores on reading readiness tests, if such tests were given; and the use of foreign language in the home.

b. Poor adaptation of materials is usually due to insufficient reading matter and an inflexible program.

c. Evidences of poor adjustment of teaching methods are as follows: poorly grouped reading classes; insufficient variety of teaching methods to reach all children; failure to analyze individual needs; insufficient practice for slow learners; overstress of some one reading skill at the expense of others; and seating arrangements poorly adapted to near or far-sighted children, or those partially deaf.

d. Motivation fails because of the teacher's lack of interest and enthusiasm; failure to relate reading to the child's life experiences and interests; motivation by threats, punishment, or shaming; and selection of material which has no appeal to the child because he lacks the concepts needed for enjoying the text.

e. The failure from the administrative standpoint is emphasized by overcrowded classes in which the individual is lost; insufficient testing and diagnosis; insufficient provision for the training of teachers in the methods of correcting reading disabilities; no time

allotment on the schedule for remedial work; and highly routinized procedures required of teachers which destroy flexibility and initiative.

5. Environmental factors: Environmental factors are evidenced in the lack of cooperation between home and school, resulting in the child's antagonism toward the school; emotional insecurity because of broken home, instability of parents, conflicting disciplinary measures and sibling rivalry; economic insecurity in the home; frequent moving by the parents and no stable social life; and illiteracy, foreign language, and inadequate reading interests and insufficient language background for reading.

It is evident that some of these causative factors can be corrected, and while others cannot be they must be taken into consideration in planning a remedial program.

Additional light on the visual angle comes from a report by Eames who found (6, p. 10) in a study of 350 poor readers with a median age of 9.6 years that about one-third had defective vision when both eyes were used; and about two-thirds of the right eyes had defective vision as did three-fourths of the left eyes.

McCallister gave (16, p. 38) the following causes of deficient reading which usually operate over a considerable period of time:

1. Meager reading experience

2. Personality traits
3. Meager vocabulary
4. Difficulty in initial stages of reading
5. Change of schools
6. Rapid advancement or frequent promotion
7. Low mental ability
8. Narrow reading interests
9. Defective vision
10. Improper reading procedures
11. Speech defects

In regard to the causes of defective reading (8, p. 93)

Gates had the following to say:

The causes of defective reading are many and often subtle. They may be initiated by constitutional limitations, such as defects of visual, auditory, or articulatory organs, nervous or emotional instability, or by deficiencies in neural apparatus underlying perception, memory, or associative learning. Far more frequently they are due to the acquisition of inhibiting habits as the result of training poorly adjusted to the individual's make-up, or to sheer accident, in the course of 'trial and error' learning.

Gates (8, p. 5) also summarized the points of view in regard to the causes of reading deficiencies of the past two decades as follows:

1. Reading difficulty conceived as due to organic defects.
2. Reading difficulty due to organic conditions which are not really defects.
3. Reading difficulty conceived as due to psychological process.
4. Constitutional immaturity.
5. Educational immaturity; lack of reading readiness.
6. Reading difficulties due to unfortunate forms of motivation.
7. Reading difficulty due to failures to acquire essential techniques.
  - a. May be due to ineffectual types of teaching.
  - b. Unfortunate "accidents" in the process of learning frequently result in reading difficulties.

After a review of the above factors contributing to reading disabilities the statement of Monroe and Backus (17, p. 12) is very apparent, "Reading disabilities are usually the result of several contributing factors rather than one isolated cause."

Determining deficient students. In the discussion of the factors contributing to reading disabilities, above, detailed means of determining the effect and extent of each factor are given. Then as a summary, in general, students deficient in reading should be determined by use of a series of standardized tests. These tests should contain elements for measuring oral and silent reading, word recognition, paragraph meaning, vocabulary, location of information, comprehension, rate, etc.

Even though standardized tests are the generally accepted form for determining reading deficiencies, sometimes, due to students' reactions, better results can be secured or at least supplementary evidence can be obtained from informal teacher-made tests and general observations. McCallister suggested (16, p. 74) that the following questions may be answered by informal tests and teacher observations:

1. Can the pupil interpret with facility materials of the level of difficulty ordinarily assigned in his regular class work?

2. Can he comprehend the more important thoughts of a passage at a single reading?
3. Can he interpret a passage satisfactorily on rereading?
4. Is excessive rereading necessary for interpretation?
5. Does he read carefully enough to comprehend full and complete answers to questions, or is he satisfied with superficial interpretations?
6. Does he recognize his own shortcomings when given an opportunity to correct his own errors?
7. Can he direct his attention effectively to content?
8. Can he secure the exact thought of the author?
9. Does he distinguish between relative values such as the difference between main thoughts and details?
10. Does his oral reading give evidence of intelligent interpretation, or is it jerky and expressionless?
11. Can he select pertinent material in response to questions?

### Organization of Remedial Programs

Remedial instruction should be planned only after a careful diagnosis has indicated the elements in which the student is deficient. Gates (8, p. 25) stated:

Remedial instruction, as the phrase implies, is designed to improve abilities in which the diagnosis has revealed deficiencies. Such teaching is intended to correct demonstrated weakness or to remove inappropriate habits. It emphasizes administering to individual needs since a type of instruction seriously needed by one pupil may be disadvantageous to another. ...Remedial instruction, then, is first and primarily individual prescription for individual needs.

Yoakam (25, p. 4) gave the following fundamental steps in a reading program which are applicable to remedial work:

1. Survey of the reading situation
2. Determination of objectives



3. Selection and use of reading materials
4. Organization of an adequate program
5. The supervision of method
6. The testing of results
7. Organization of a revised program

Yoakam also advised a check of an detailed instruction in the following, preparatory to remedial work (26, p. 169):

1. Use of table of contents
2. Use of index
3. Use of chapter headings, references and bibliography
4. Use of Dewey decimal system of classification
5. Use of card catalog
6. Use of dictionary, encyclopedia, and such statistical abstracts as the world almanac

Motivation. At the outset of any remedial program probably one of the more important factors is that of motivating the work. Gates suggested (7, p. 30) the following means for the motivation of remedial instruction in reading:

1. Interest developing devices
2. Make improvement possible
3. Adjust materials to pupil's ability
4. Select attractive content material and exercises
5. Measure and display improvement
6. Enlist the competitive impulse
7. Detect the pupil's particular errors and successes

Dolch listed (5, p. 5) the following common motives in the teaching of beginning reading, which can be applied to remedial work at that level:

1. Story motive
2. Play motive
3. Mastery motive
4. Utility motive
5. Please the teacher motive

It should be borne in mind that remedial instruction is not far different from ordinary classroom instruction except that it must be much more individualized. To secure the desired interest, work must be motivated upon an individualized basis according to the individual's specific needs and interests.

In order to secure the proper motivation, Gates suggested (8, p. 26) that in the selection and organization of materials the following points should be considered: The material should be highly interesting to the pupil; the materials should be of proper difficulty; the materials should be of various types; and an abundance of easy reading should be provided as a substitute for review.

Corrective measures. While corrective measures were not discussed in detail with the discussion of causal factors above, in a great many cases the corrective measures are self-evident in a study of the contributing factors themselves.

Table 2. Suggested list of corrective and remedial measures (McCallister, 15, p. 86).

Description of deficiency	Probable cause of deficiency	Suggestive measures
Failure to direct attention effectively to content	Over emphasis on oral reading in lower grades	Encourage silent reading accompanied by some device for securing effective interpretation

Table 2 (cont.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
	Poorly developed habits of sustained application	Provide relatively easy and interesting content  Arrange periods of silent reading followed by periods of discussion in which pupil is led to contribute
	Lack of interest in material	Arouse interest in selections by raising questions and by making suggestions about them  Tell briefly the story of unfamiliar selections before pupil reads them  After part of the story has been read and interest has been aroused, permit pupil to complete story alone  Choose selections likely to appeal to pupil's interest  Stimulate pupil to select stories suitable to read to others
.....		
Lack of attention to detail	Pupil has formed habit of superficial reading	Give specific directions to center attention on important points  Direct attention to details by means of questions

Table 2 (cont.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
		Assign directions for drawing a figure or picture, finding out how to perform school activities, finding out what to do in emergencies, etc.
.....		
Inaccuracy in interpretation	Careless or ineffective reading habits	Provide practice in reproducing content of short selections
		Direct attention to errors by having pupil reread parts of selections which have been misinterpreted.
.....		
Inability to interpret with facility reading materials ordinarily assigned to upper grades	Meager reading experience due to such things as loss of time from school, illness, or physical disabilities, etc.	Provide a variety of interesting reading material of easy gradient to accelerate growth in reading ability
	Slow learning in subjects including reading	Accelerate growth by giving extra time to reading materials suited to pupil's ability
	Poorly developed habits of recognition	(See suggestions for improving recognition given below)
.....		

Table 2 (cont.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
Failure to relate reading materials to previous experience and to think independently	Lack of training in using reading as an aid to higher thought processes	Ask thought provoking questions about passages which have been read
		Guide pupils in the study of problems connected with subjects other than reading
		Train in selecting relative values by having pupils read to locate favorite parts of a selection, beautiful descriptive passages, good character sketches, humorous passages, etc.
		Provide training in organization by having pupils analyze an author's organization; select items to be included in a summary, etc.
Meager meaning vocabulary	Limited experiential background or limited reading experience	Have pupils read to determine the author's purpose
		Stimulate wide reading of relatively simple and varied selections
		Encourage use of the dictionary when meaning of unfamiliar words cannot be ascertained from context
		Have pupils select synonyms of words

Table 2 (cont.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
		Have pupils construct sentences illustrating various ways of using words
		Have pupils read to find expressive words, descriptive words, etc.
		Assist pupils to derive word-meanings independently by directing attention to context
.....		
Inability to cope with new words	Lack of training in word recognition	Divide words into syllables to assist pupil in recognizing familiar parts
		Direct attention to phonetic elements which assist in word recognition
		Compare unknown words with familiar words containing similar phonetic elements
		Use words missed repeatedly in quick perception drills
.....		
Inaccuracy in the recognition of familiar words	Eye defects which interfere with visual acuity	Provide for correction with glasses by competent specialist
	Careless habits of recognition	Provide practice in careful reading of relatively easy material
.....		

Table 2 (cont.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
Oral reading jerky and expressionless	Reading material too difficult	Use easier material
	Inadequate training in oral reading	Have pupils choose, prepare, and read selections for entertainment of other pupils
		Encourage pupils to read aloud passages which make contributions to group discussions
		When differences of opinion arise, encourage pupils to read passages aloud to prove points
	Speech defects	Provide corrective speech exercises
.....		
Narrow span of recognition	Over emphasis on oral reading in lower grades	Provide practice in rapid silent reading of simple material
	Over emphasis on word drill in lower grades	Direct attention to thought units by penciling under the entire unit
		Drill with flash card exercises
		Have pupil read silently as teacher reads aloud emphasizing phrasing
.....		

Table 2 (cont.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
slow rate of reading	Difficulties in interpretation	(See suggestions for comprehension)
	Slow worker in all subjects including reading	Accelerate growth in reading by giving extra time to rapid reading
	Poorly developed habits in rate of reading	Provide short timed exercises requiring pupil to read as rapidly as he can interpret
		Provide opportunity for much rapid reading of relatively simple material
		Encourage voluntary practice of rapid reading
		Read a sentence at random. Have pupils locate sentences as quickly as possible
		Provide practice in skimming to locate specific information on topics or problems
		Provide practice in skimming to secure general impressions
	Improper habits in mechanics of reading such as excessive vocalization or excessive head-movement	Guide pupil in overcoming improper habits by explaining their effects and giving suggestions for overcoming them

.....



Table 2 (concl.)

Description of deficiency	Probable cause of deficiency	Suggestive measures
Rapid superficial reading	Poorly developed habits of interpretation	(See suggestions for directing attention to content)

Administering the program. The administration of the program is not solely a teacher problem, nor can the burden be borne by the administrative officials alone. It requires well thought out planning and close cooperation between teachers and administrative officers.

Monroe and Backus offer (17, p. 39) the following guide posts for the administration of remedial work:

1. Remedial work is most effective when given individually; however, it can be given effectively to small groups, if the individual needs are not overlooked in the group.
2. Remedial work is the most effective when given at a favorable time of the day, at systematic, regular periods.
3. Remedial reading requires a supply of interesting and varied reading materials suitable to the child's needs and reading level.
4. Remedial reading requires the specific training of teachers for the work.
5. The remedial reading program may be carried out by a specially trained remedial teacher, or by regular teachers working with their own poor readers under supervision.

Gates also reported (8, p. 30) that in handling the remedial instruction the following cautions should be observed:

1. Remedial instruction should not be substituted for enjoyable activities.
2. Remedial instruction should be managed so as not to classify the pupil in an embarrassing way.
3. The time allowance for remedial work should be generous.
4. The teacher should have sufficient time to arrange and supervise the remedial work.
5. Remedial work may be either individual or cooperative.
6. Remedial work should be begun at a favorable time.
7. Success should be emphasized in remedial work.
8. Improvement should be measured and the record shown.
9. The competitive impulse should be enlisted.
10. The pupils particular errors and successes should be detected.
11. The teacher's attitude should be optimistic and encouraging.
12. Practice should be so distributed as to avoid fatigue and boredom.
13. A variety of exercises and activities should be provided.
14. A plan should be dropped when it fails to produce results after a fair trial.
15. Individual supervision should be continued until the pupil has his improved techniques well habituated.

## METHODS OF PROCEDURE

### Preliminary Surveys

Survey of the elementary schools. The Gates silent reading tests were administered in the Manhattan elementary schools in the spring of 1937.

Tables 3 to 8 give a picture of the reading situation in grades III to VIII as determined by the Gates silent reading tests. The tables give the results for each class

of each grade which not only made possible a comparison of the classes within a grade, but also a comparison of the relative standing of the different grades. The tables give the standard as set up by the Gates tests, the class median, and the number of students above and below the standard in each class of each grade. These results are given in both reading age and reading grade for each of the four parts of the test, and for the total of the four parts.

It is worthy of note that there was not a single class in the third, fourth and eighth grades with more students below the standard than above, and the fifth, sixth and seventh grades had but one class each in which there were more students below the standard than above. Also, in one class of 34 students in the third grade and in one class of 29 in the fourth grade, all members of the class were above the standard set up by the Gates tests.

While this particular report of the survey of the elementary schools does not attempt to point out individual weaknesses, it does indicate that there was, in general, a satisfactory reading situation in the Manhattan elementary schools. This was especially pertinent as it had a bearing on the efficiency of the pre-junior high training in reading of most of the students included in the study of our problem in the junior high school. This "satisfactory

Table 3. Standing of the third grade on the Gates silent reading tests.

	Type A		Type B		Type C		Type D		Total	
	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age
<u>Packwood</u>										
Standard	3.55	9-5								
Median	3.8	9-4	3.7	9-3	4.0	9-8	4.3	10-0	4.17	9-6
Above	19	11	20	13	21	15	26	24	23	17
Below	11	19	9	16	9	15	3	5	7	13
<u>Gamber</u>										
Standard	3.55	9-5								
Median	4.0	9-8	3.9	9-6	4.5	10-3	4.5	10-3	4.5	10-1
Above	25	17	27	21	28	22	31	30	24	24
Below	8	16	9	15	3	9	1	2	4	4
<u>Hobbs</u>										
Standard	3.55	9-5								
Median	4.0	9-8	3.5	9-0	4.2	9-11	4.2	9-5	3.8	9-2
Above	10	7	9	4	12	9	13	10	12	4
Below	4	7	5	10	2	5	1	4	2	10
<u>Saunders</u>										
Standard	3.55	9-5								
Median	3.2	9-8	3.7	9-8	3.4	9-9	4.9	9-7	3.85	9-5
Above	18	14	18	14	22	14	27	25	23	15
Below	12	16	12	16	8	16	3	5	7	15
<u>Pitzer</u>										
Standard	3.55	9-5								
Median	4.3	10-0	4.2	9-11	4.5	10-3	4.9	10-8	4.5	10-3
Above	35	24	32	24	34	31	35	35	34	30
Below	1	12	3	11	3	6	0	0	0	4
<u>Sitterley</u>										
Standard	3.55	9-5								
Median	3.6	8-10	3.9	9-6	4.0	9-8	4.5	10-0	4.3	9-5
Above	18	10	19	14	20	15	23	23	21	14
Below	10	18	8	13	8	13	4	4	6	13

Table 4. Standing of the fourth grade on the Gates silent reading tests.

	Type A		Type B		Type C		Type D		Total	
	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age
<u>Walter</u>										
Standard	4.55	10-5								
Median	5.6	11-5	6.5	12-3	7.0	13-9	5.6	11-5	5.9	11-7
Above	29	27	29	28	29	29	29	29	29	29
Below	0	2	0	1	0	0	0	0	0	0
<u>Cooper</u>										
Standard	4.55	10-5								
Median	5.1	11-0	5.5	11-4	7.5	13-3	5.6	11-5	6.2	11-11
Above	29	25	27	24	30	30	31	31	29	29
Below	2	6	4	7	1	1	0	0	2	2
<u>Swalander</u>										
Standard	4.55	10-5								
Median	4.4	10-1	5.0	10-10	4.2	9-11	5.2	11-1	4.7	10-4
Above	26	20	25	19	26	21	28	25	28	24
Below	4	10	5	11	2	7	0	3	2	6
<u>Carney</u>										
Standard	4.55	10-5								
Median	4.3	10-0	5.5	11-4	5.5	11-4	5.15	11-0	5.05	10-10
Above	26	18	26	24	26	23	27	27	27	25
Below	2	10	2	4	2	5	1	1	1	2
<u>Hobbs</u>										
Standard	4.55	10-5								
Median	3.4	8-10	3.4	8-10	3.8	9-4	4.2	9-11	3.6	8-8
Above	3	3	1	1	5	3	6	6	5	2
Below	4	4	6	6	2	4	1	1	2	5
<u>Sitterley</u>										
Standard	4.55	10-5								
Median	5.0	9-8	5.0	10-10	4.5	10-3	5.2	11-1	5.0	10-4
Above	13	11	18	16	17	14	23	20	18	14
Below	16	18	11	13	11	14	5	8	12	16

Table 5. Standing of the fifth grade on the Gates silent reading tests.

	Type A		Type B		Type C		Type D		Total	
	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age
<u>Coltharp</u>										
Standard	5.55	11-5								
Median	4.6	10-3	7.0	12-9	6.0	11-10	5.9	11-8	6.1	11-11
Above	13	13	27	26	22	19	17	17	22	20
Below	18	18	4	5	9	12	14	14	9	11
<u>Brown</u>										
Standard	5.55	11-5								
Median	3.8	8-10	3.9	9-6	4.8	10-7	4.7	10-4	4.5	10-1
Above	1	1	2	6	5	2	2	2	2	2
Below	11	11	10	10	6	7	10	10	10	10
<u>Bebermeyer</u>										
Standard	5.55	11-5								
Median	5.1	10-3	6.0	11-10	7.0	12-9	6.3	12-1	6.3	12-0
Above	14	14	20	19	24	22	16	16	18	17
Below	14	14	8	9	4	6	12	12	10	11
<u>Bowman</u>										
Standard	5.55	11-5								
Median	5.6	11-5	6.0	11-10	5.5	11-4	7.6	13-4	6.2	12-0
Above	15	15	18	15	15	12	19	19	16	15
Below	12	12	9	12	12	15	8	8	11	12
<u>Dean</u>										
Standard	5.55	11-5								
Median	9.7	15.6	6.0	6-5	7.3	13-6	7.3	13-0	7.4	13-4
Above	26	26	22	16	26	24	20	20	24	24
Below	4	4	8	14	4	6	10	10	7	7
<u>Peters</u>										
Standard	5.55	11-5								
Median	4.0	9-8	6.5	12-3	6.0	11-10	5.6	11-5	5.7	11-3
Above	6	6	18	16	20	16	15	15	16	14
Below	23	23	10	12	10	14	13	13	12	14

Table 6. Standing of the sixth grade on the Cates silent reading tests.

	Type A		Type B		Type C		Type D		Total	
	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age
<u>Faley</u>										
Standard	6.55	12-5								
Median	6.6	11-11	6.5	12-3	7.5	13-3	7.1	12-10	7.0	13-0
Above	17	9	19	16	25	22	19	19	19	19
Below	16	24	14	17	8	11	14	14	14	14
<u>Barr</u>										
Standard	6.55	12-5								
Median	7.6	13.4	7.5	13-3	9.7	15-6	7.5	13-4	8.5	13-2
Above	23	19	28	23	27	25	17	17	23	22
Below	10	14	5	10	6	8	16	16	10	11
<u>Brown</u>										
Standard	6.55	12-5								
Median	3.4	8-10	5.0	10-10	5.5	11-4	5.6	11-5	4.8	10-5
Above	1	0	3	3	3	3	1	1	1	1
Below	3	4	1	1	1	1	3	3	3	3
<u>Colyer</u>										
Standard	6.55	12-5								
Median	5.1	10-10	6.2	12-0	8.0	13-9	6.3	12-1	6.7	12-2
Above	9	8	13	11	16	15	11	11	14	9
Below	17	18	13	15	10	11	15	15	12	17
<u>Hilton</u>										
Standard	6.55	12-5								
Median	7.1	12-10	8.7	14-5	9.7	15-6	8.8	14-7	9.4	15-2
Above	26	24	32	31	31	30	27	26	31	27
Below	10	12	4	5	5	6	9	10	5	9
<u>Liggett</u>										
Standard	6.55	12-5								
Median	6.6	11-11	7.0	12-9	6.5	12-4	6.7	12-5		
Above	17	14	22	19	19	16	17	17	19	16
Below	16	19	10	13	14	17	16	16	13	16

Table 7. Standing of the seventh grade on the Gates silent reading tests.

	Type A		Type B		Type C		Type D		Total	
	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age
<u>Griffith (1st hour)</u>										
Standard	7.55	13-5								
Median	7.1	12-10	7.0	12-9	9.1	14-10	8.8	14-7	8.0	13-9
Above	12	11	15	12	23	23	17	13	16	14
Below	24	25	21	24	13	13	19	23	22	24
<u>Griffith (2nd hour)</u>										
Standard	7.55	13-5								
Median										
Above	17	15	26	22	33	31	35	31	29	27
Below	23	25	14	18	8	9	5	9	11	13
<u>Griffith (3rd hour)</u>										
Standard	7.55	13-5								
Median										
Above	13	11	19	16	25	25	24	22	20	18
Below	26	28	20	23	14	14	16	17	19	21
<u>Fulcher</u>										
Standard	7.55	13-5								
Median	7.6	13-4	8.5	14-3	8.6	14-4	7.6	13-4	8.2	13-11
Above	38	31	39	37	41	38	38	32	38	36
Below	26	33	25	27	23	26	26	32	26	28



Table 8. Standing of the eighth grade on the Gates silent reading tests.

	Type A		Type B		Type C		Type D		Total	
	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age	Reading Grade	Reading Age
<u>Barber</u>										
Standard	8.55	14-5								
Median	7.1	12-10	7.5	13-3	8.6	14-4	9.2	15-0	8.1	13-10
Above	17	17	19	15	20	18	19	19	18	17
Below	20	20	18	22	16	18	17	17	18	19
<u>Zirkle</u>										
Standard	8.55	14-5								
Median	10.2	16-0	9.5	15-4	9.1	14-10	9.9	15-8	9.7	15-6
Above	50	50	51	45	44	39	46	46	49	43
Below	21	21	20	26	28	33	26	26	23	28
<u>Kimball</u>										
Standard	8.55	14-5								
Median	7.6	13-4	8.0	13-9	9.7	15-6	8.0	13-9	8.3	14-1
Above	22	22	27	23	41	35	28	28	30	27
Below	38	38	33	37	19	25	31	31	29	32

condition" is more apparent in Table 9:

Table 9. Summary of students above and below standard on the Gates tests.

Grade	Number of students above standard	Number of students below standard	Per cent above standard
III	137	26	84
IV	136	19	87
V	98	59	62
VI	107	57	65
VII	103	78	57
VIII	97	70	58

While the reading situation in general can be said to be good, it is worthy of note that there was an apparently consistent decline in the percentage above standard, which seemed to indicate a decline in the efficiency of the teaching. This is shown in Figure 1.

Junior High school survey. The Iowa silent reading tests, form A, were administered to the seventh, eighth, and ninth grades of the Manhattan junior high school during September, 1937. After the tests were scored and rechecked for accuracy, frequency distributions were drawn up for each trait, that is, paragraph meaning, word meaning, selection of central idea, sentence meaning, location of information, rate, and the total for comprehension--keeping each class of each grade separate.

Under the construction of the Iowa tests, the

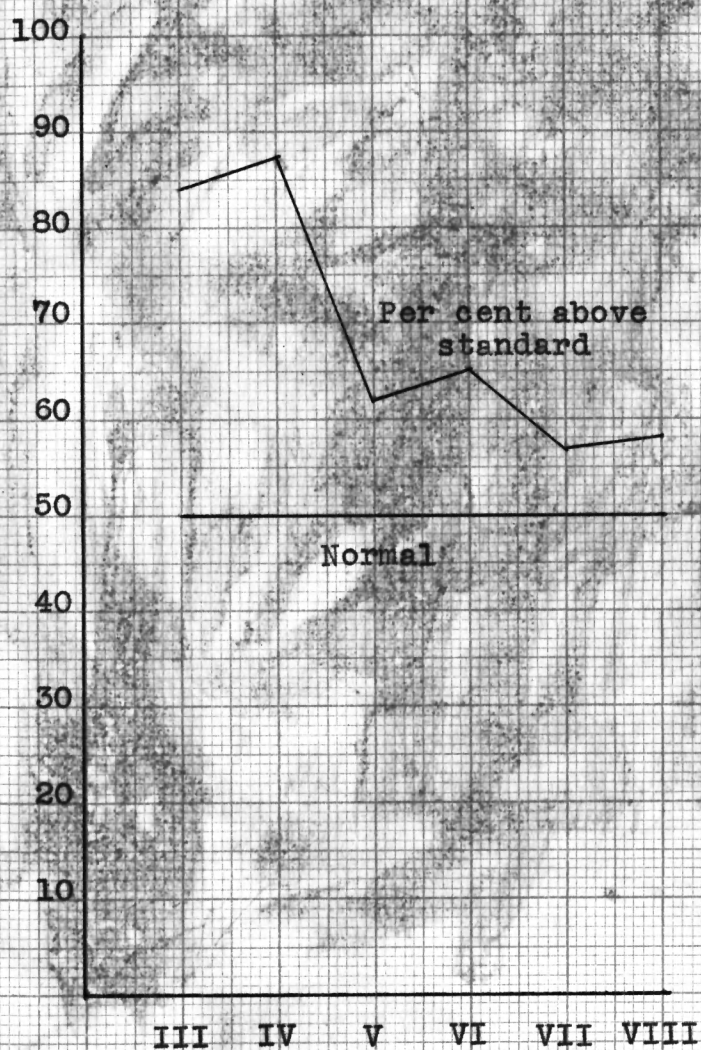


Fig. 1. Showing the percentage of students above standard in grades III - VIII as determined by the Gates silent reading tests.

comprehension score is a composite score made up of a total of the scores on the five traits, paragraph meaning, word meaning, selection of central idea, sentence meaning, and location of information. To give a picture of the reading situation as interpreted from the comprehension scores, Table 10 gives the raw score distributions for grades seven, eight and nine. Table 11 gives the reading grade, reading grade norm, and the deviation from the reading grade norm for the first and third quartiles and the median for each of the grades.

The information in Table 11 (reading grade, reading grade norm, and deviation from norm) was determined, and should be interpreted as follows: The first and third quartiles and median were computed for each distribution table and then expressed in a reading grade by use of the table of grade equivalents furnished in the manual of directions for the Iowa tests. The reading grade norm was arrived at indirectly by using both the table of grade norms and the table of grade equivalents. After the raw score norm had been read from the table of grade norms, it was transferred to a reading grade norm by use of the table of grade equivalents.

The deviation from the norm is the number of "months" above or below the reading grade norm of the actual reading

Table 10. Raw score distributions for comprehension.

	Seventh grade	Eighth grade	Ninth grade
210-219			
200-209			4
190-199		4	9
180-189	3	5	8
170-179	3	6	25
160-169	7	13	26
150-159	6	12	23
140-149	11	16	30
130-139	13	14	27
120-129	11	13	29
110-119	18	29	16
100-109	21	18	16
90-99	21	15	10
80-89	23	5	6
70-79	7	5	2
60-69	6	6	1
50-59	10	5	
40-49	1		1
30-39			
20-29	<u>2</u>	<u>1</u>	<u>    </u>
	163	167	233
$Q_3$	131.4	148.9	165.3
Md.	105.5	119.8	142.5
$Q_1$	86.4	102.6	122.2

Table 11. Showing reading grade, reading grade norm, and deviation from norm for seventh, eighth and ninth grades.

	Reading grade	Reading grade norm	Deviation from norm
Seventh grade			
Q	8-5	8-3	2 months
Md.	7-3	6-10	3 "
Q	6-5	5-7	8 "
Eighth grade			
Q	9-5	9-5	0 "
Md.	7-10	7-10	0 "
Q	7-2	6-7	5 "
Ninth grade			
Q	10-3	10-6	- 3 "
Md.	9-1	8-10	1 "
Q	8-1	7-6	5 "

grade. The term month does not indicate a calendar month but one of the ten parts into which the school year is divided.

It will be noted from Tables 10 and 11 that the reading situation in the seventh grade is well above average, and while the situation is not as favorable in the eighth and ninth grades, the condition is not alarming.

### Remedial Classes

Determining deficient students. It was felt that a number of students falling in the lower end of the distributions could be benefited materially from remedial work. So it was decided to give remedial work to as many as possible of the thirty or forty lowest ranking students in each of the seventh, eighth and ninth grades. This number of course was dependent upon conflicting class schedules, the necessity of completing work required for graduation, and other uncontrollable factors.

With this plan in mind, a point was arbitrarily selected on each of the frequency distributions for each of the traits below which between thirty and forty of the students would be included. Then, returning to the original data, a list was made of the students falling below this arbitrary point for each of the five traits, total comprehension and rate. From these lists a new list was made

indicating in how many of the traits each of the students was deficient, and to what degree each was deficient. This enabled us to determine if a student was generally weak, or whether he was merely weak in one or two traits, and as to just how seriously he was deficient in each.

For the lack of better terminology and for convenience in later discussion, this group will be called the group "below par."

From this "below par" group, after eliminating those with conflicting class schedules, those who needed to take a full schedule of work required for graduation, and others for whom it was impossible to arrange the work, the personnel of the remedial classes was made up. These remedial classes included 19 in each of the seventh and eighth grades, and 21 for the ninth grade. Work was begun in the remedial classes shortly after the start of the second semester.

Aiding in diagnosis. As an aid to Mr. R. W. Browning and the two teachers who handled the remedial classes, a diagnosis sheet was prepared in cooperation with Mr. J. R. Stewart, principal of the Eugene Field school. The diagnosis sheet was drawn up to supplement the findings of the Iowa reading tests. Realizing that there are a number of symptoms of poor reading that are symptoms only, an attempt was made to include only causal factors.



Space was allowed for the recording of the results of the Iowa tests in both reading age and reading grade for each of the traits measured. The value of this lay in the fact that a comparison of the child's reading grade in each of the traits with his actual grade placement could be made at a glance; also, a comparison of his reading age achievements in each trait could be made with his chronological age if he happened to be above or below the normal age for his grade placement. Space might have been allowed for a subjective evaluation of each trait by the teacher, but it was felt that this would not be of any great value unless the teacher fell back upon some objective measurement such as the Iowa tests.

The diagnosis sheet was a product of the study of current literature and a comparison and evaluation of diagnosis sheets advocated by a number of authorities in the field. From a study of literature, the most apparent weakness of this sheet was the lack of comparison of the results of the Iowa tests with other recognized tests. A much more accurate and dependable picture of the standing of each pupil could have been attained if the results of tests other than the Iowa tests had been available for comparison, and for the establishment of a reading or achievement quotient.

The diagnosis sheet was tried out on a number of pupils and then revised with the suggestions of teachers using it.

The chief criticism of this diagnosis sheet, or of any sheet for that matter, was the amount of time required for its use. However, it should be borne in mind that the deficient readers were determined by the testing program, and the sheet was used only to determine the actual causes of deficient reading among the smaller number actually encountering marked reading disabilities.

The diagnosis sheet, as revised, follows:

#### Form 1.

#### Diagnosis Sheet

I. Pupil's Name \_\_\_\_\_ Date \_\_\_\_\_

II. Age \_\_\_\_\_ Grade \_\_\_\_\_

III. Results of Iowa Silent Reading Tests.

A. Paragraph Meaning

1. Science  
Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

2. History  
Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

TOTAL PARAGRAPH MEANING  
Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

B. Word Meaning

1. General Vocabulary  
Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

2. Subject-Matter Vocabulary  
Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

TOTAL WORD MEANING  
Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

C. Selection of Central Idea of Paragraph  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

D. Sentence Meaning  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

E. Location of Information  
 1. Alphabetizing  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_  
 2. Use of the Index  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_  
 TOTAL LOCATION OF INFORMATION  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

TOTAL COMPREHENSION SCORE  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

F. Rate of Silent Reading  
 Reading Age \_\_\_\_\_ Reading Grade \_\_\_\_\_

IV. Intelligence Quotient \_\_\_\_\_ Name of Test \_\_\_\_\_

V. Visual Ability\* \_\_\_\_\_ Auditory Ability\*\* \_\_\_\_\_

VI. General Health \_\_\_\_\_

\* Telebinocular

\*\* Audiometer

VII. Home Environment

A. Nationality \_\_\_\_\_ Race \_\_\_\_\_

B. Are the parents aware of the pupil's reading difficulty and willing to cooperate in removing it? \_\_\_\_\_

C. Are suitable reading materials available in the home? \_\_\_\_\_

D. Is home atmosphere conducive to reading? \_\_\_\_\_

E. Does the home environment provide opportunity for rich, varied experiences such as travel, intelligent conversation concerning social problems, science, etc.? \_\_\_\_\_

#### VIII. Mechanics of Reading

A. Does the pupil have a sufficient knowledge of phonetics to aid him in pronouncing words independently? \_\_\_\_\_

B. Is oral reading smooth and expressive or jerky and monotonous? \_\_\_\_\_

C. Can the pupil pronounce unfamiliar words with the aid of the dictionary? \_\_\_\_\_

#### IX. Organization

A. Can the pupil make a simple outline? \_\_\_\_\_

B. Can the pupil summarize adequately either orally or in writing? \_\_\_\_\_

X. Are there evidences of lack of either immediate or delayed memory? \_\_\_\_\_

#### XI. Attitudes and Habits

A. IS the pupil aware of his deficiency and has he a desire to improve upon it? \_\_\_\_\_

B. What free choice reading does the pupil do? \_\_\_\_\_

\_\_\_\_\_

C. How much leisure time does the pupil have and how does he utilize it? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Control Groups

Determination of control groups. With the start of the remedial classes it was not found possible to arrange for a control group. Later it developed that what in effect might be considered a control group was available. Since the remedial classes included less than half of the "below par" group, it was found that by carefully matching the total comprehension scores of students in the remedial classes with the total comprehension scores of others in the "below par" group but not in the remedial classes, a satisfactory control group was available.

In the matching of the control groups with the remedial groups, it was not possible to obtain perfectly matched pairs in all cases, but the maximum deviation for the seventh grade was the difference between a score of 92 and one of 95, or a difference of only three points. For the eighth grade the maximum difference was nine points, and for the ninth grade, six points. On the basis of the totals of the scores, the control group of the ninth grade ranked only .82 of 1 per cent above the remedial group; the remedial group of the eighth grade ranked .76 of 1 per cent above the control group; and the totals of the remedial and the control group in the seventh grade were exactly the same.

It would have been desirable to have matched other factors such as intelligence quotients, mental ages, chronological ages and sex, but it was not found possible in this case.

### Reading Consciousness Program

Creation of reading consciousness. The first impetus toward reading consciousness came with the initial testing program which enabled the students and teachers alike to know the relative reading abilities of the students. To assist the teachers in solving the reading problem, the outstanding works in the field of reading were purchased and made available to all of the teachers. Additional supplementary reading materials were purchased for the students and classroom libraries were enlarged. Work was planned so that more time was available for the use of the school and city libraries. Special attention was given to reading in the content subjects. Faculty meetings were devoted to the reading problem and special reading bulletins were prepared by Dr. Sheffer. In fact, anything conducive to emphasis on reading was welcomed.

### Final Survey

Survey in the junior high school. Form B of the Iowa silent reading tests was given to the seventh, eighth and

ninth grades in May, 1938 to determine a picture of the reading situation at that time, and to determine the effectiveness of the reading program.

Table 12 gives the raw score distributions for comprehension on the May tests, and Table 13 gives the reading grade norm, and deviation from the reading grade norm for the first and third quartiles and the median.

From Tables 10 to 13 there appeared to be a satisfactory reading situation in the junior high, with the possible exception of the ninth grade. This is further indicated in Table 14 which is a summary of Tables 11 and 13:

Table 14. The deviation of reading grade measures from the reading grade norm on the September and May tests.

	September comprehension	May comprehension
Seventh grade		
Q <sub>3</sub>	2	3 months
Md.	3	4 "
Q <sub>1</sub>	8	8 "
Eighth grade		
Q <sub>3</sub>	0	-1 "
Md.	0	3 "
Q <sub>1</sub>	5	3 "
Ninth grade		
Q <sub>3</sub>	-3	-5 "
Md.	1	-2 "
Q <sub>1</sub>	5	0 "

Table 12. Raw score distribution for comprehension in the seventh grade.

	Seventh grade	Eighth grade	Ninth grade
210-219		1	1
200-209		3	4
190-199	3	8	17
180-189	6	8	14
170-179	16	19	20
160-169	11	17	25
150-159	14	23	21
140-149	13	19	21
130-139	22	12	20
120-129	21	17	20
110-119	19	16	14
100-109	13	16	11
90-99	13	5	2
80-89	8	4	3
70-79	3	4	
60-69	4		3
50-59	1	1	
40-49	2		
30-39			
20-29	1		
	<hr/>	<hr/>	<hr/>
	170	173	191
$Q_3$	155.4	167.5	175.1
Md.	129.0	146.1	153.9
$Q_1$	108.1	118.3	128.8



Table 13. Reading grade, reading grade norm, deviation from norm for seventh, eighth and ninth grades.

	Reading grade	Reading grade norm	Deviation from norm
Seventh grade			
Q <sub>3</sub>	9-8	9-5	3
Md.	8-4	7-10	4
Q <sub>1</sub>	7-5	6-7	8
Eighth grade			
Q <sub>3</sub>	10-5	10-6	- 1
Md.	9-3	8-10	3
Q <sub>1</sub>	7-9	7-6	3
Ninth grade			
Q <sub>3</sub>	10-9	11-4*	- 5
Md.	9-8	9-10	- 2
Q <sub>1</sub>	8-4	8-4	0

\*Extrapolated

In order to determine the effectiveness of the reading consciousness program, it was necessary to eliminate the students that had received remedial treatment in the remedial classes, and also, all of the students, who for some reason or other, failed to take the tests both in the fall and in the spring. Table 15 gives the raw score distribution for the matched groups on both the September and May tests. Table 16 gives the reading grade, reading grade norm, and the deviation from the reading grade norm for the first and third quartiles and the median.

Table 17. Statistical treatment of data in Table 15.

	Standard deviation	Median	P. E. Md.
7th grade-September	97.2	134.7	7.05
7th grade-May	99.3	108.0	7.19
8th grade-September	96.2	155.3	6.92
8th grade-May	88.6	127.2	6.37
9th grade-September	88.3	156.7	5.86
9th grade-May	88.2	146.3	5.85

For the seventh grade, the difference between the median on the May tests and the median on the September tests (Table 15) was 26.7, and the probable error of the difference of the two medians was 10.07, giving a critical ratio of 2.65.

Table 15. Raw score distributions for comprehension of the "matched" groups.

	Seventh grade		Eighth grade		Ninth grade	
	May	Sept.	May	Sept.	May	Sept.
210-219			1		1	
200-209			3		4	3
190-199	3		7	4	16	8
180-189	6	2	7	5	13	7
170-179	15	3	16	5	18	19
160-169	11	7	17	12	24	21
150-159	13	6	19	12	18	16
140-149	11	11	17	15	18	22
130-139	19	11	8	13	14	20
120-129	17	11	12	13	12	20
110-119	16	16	11	26	11	9
100-109	6	20	11	15	8	9
90-99	8	15	2	7	1	2
80-89	5	16	3	2	2	3
70-79	2	5	3	2		1
60-69	3	5		4	2	1
50-59		6	1	2		
40-49		1				1
30-39						
20-29	1	1		1		
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	136	136	138	138	162	162
$Q_3$	160.4	134.9	169.5	152.4	175.9	167.8
Md.	134.7	108.0	155.3	127.2	156.7	146.3
$Q_1$	115.1	89.5	122.4	110.1	132.7	136.7

Table 16. Reading grade, reading grade norm, and deviation from norm for "matched" groups.

	Reading grade	Reading grade norm	Deviation from norm
Seventh grade (Sept.)			
Q3	8-7	8-3	4
Md.	7-5	6-10	5
Q1	6-6	5-7	9
Seventh grade (May)			
Q3	10-1	9-5	6
Md.	8-7	7-10	7
Q1	7-8	6-7	11
Eighth grade (Sept.)			
Q3	9-6	9-5	1
Md.	8-3	7-10	3
Q1	7-5	6-7	8
Eighth grade (May)			
Q3	10-6	10-6	0
Md.	9-8	8-10	8
Q1	8-1	7-6	5
Ninth grade (Sept.)			
Q3	10-5	10-6	- 1
Md.	9-3	8-10	3
Q1	8-3	7-6	7
Ninth grade (May)			
Q3	10-10	11-4 *	- 4
Md.	9-9	9-10	- 1
Q1	8-6	8-4	2

\* Extrapolated

$$\text{Critical ratio} = \frac{\text{May Md.} - \text{Sept. Md.}}{\text{P. E. May Md.} - \text{Sept. Md.}}$$

In the eighth grade, the difference between the median on the May tests and the median on the September tests (Table 15) was 28.1 and the probable error of the difference of the medians was 9.41, giving a critical ratio of 2.99.

For the ninth grade, the difference between the median on the May tests and the median on the September tests (Table 15) was 10.4 and the probable error of the difference of the two medians was 8.28, giving a critical ratio of 1.27.

In order to be statistically significant, a statistical measure must be at least four times as great as its probable error (13, p. 237) or, in other words, have a critical ratio of at least four. Therefore, statistical significance can not be ascribed to the median gains of the seventh, eighth and ninth grades. A comparison of the gains made is given in Table 18 and is taken from the data in Table 16:

Table 18. Comparison of May comprehension with September comprehension for the "matched" groups of the seventh, eighth and ninth grades.

	Q <sub>3</sub>	Md.	Q <sub>1</sub>
<u>Seventh</u> <u>grade</u>			
Grade equiv. for May	10-1	8-7	7-8
Grade equiv. for Sept.	8-7	7-5	6-6
Gains	14	12	12 months
Normal gain	12	10	10 "
Gain above or below normal	2	2	2 "
-----			
<u>Eighth</u> <u>grade</u>			
Grade equiv. for May	10-6	9-8	8-1
Grade equiv. for Sept.	9-6	8-3	7-5
Gains	10	15	6 months
Normal gain	11	10	9 "
Gain above or below normal	- 1	5	- 3 "
-----			
<u>Ninth</u> <u>grade</u>			
Grade equiv. for May	10-10	9-9	8-6
Grade equiv. for Sept.	10-5	9-3	8-3
Gains	5	6	3 months
Normal gain	8	10	8 "
Gain above or below normal	- 3	- 4	- 5 "

Table 18 indicates that emphasis upon reading consciousness was of doubtful value. In the three grades,

four of the quartiles and one of the medians failed to improve as much as normal gain, while two of the quartiles and two of the medians showed slightly better than normal gain.

In an attempt to discover the reason for the poor showing of the ninth grade as compared with the seventh and eighth grades, the rural students were segregated from the city students in the ninth grade and the results are shown in Table 19:

Table 19. Comparison of ninth grade city students with ninth grade rural students.

	Q <sub>3</sub>	Md.	Q <sub>1</sub>
<u>Ninth grade</u> <u>city students</u> (148)			
Grade equiv. for May	10-10	9-9	8-5
Reading grade norm	11-4	9-10	8-4
Deviation from norm	- 4	- 1	1
-----			
<u>Ninth grade</u> <u>rural students</u> (33)			
Grade equiv. for May	10-6	8-10	8-1
Reading grade norm	11-4	9-10	8-4
Deviation from norm	- 8	- 10	- 3

Table 19 showed a distinct inferiority among rural students when compared with city students.

Raw score distributions were drawn up for the remedial classes and the control groups. For ease of comparison, the distributions for both the remedial class and the control group in both the September and May tests are placed in the same table. Tables 20, 21, and 22 include these distributions for the seventh, eighth, and ninth grades:

Table 20. Raw score distribution for comprehension in the remedial class and control group of the seventh grade on both the Sept. and May tests.

	Remedial class		Control group	
	Sept.	May	Sept.	May
210-219				
200-209				
190-199				
180-189				
170-179				1
160-169				
150-159		1		1
140-149		1		
130-139		1		
120-129		1		1
110-119	1	2	1	3
100-109		6		1
90-99	3	2	3	4
80-89	7	1	7	3
70-79	1		1	2
60-69	2	1	2	2
50-59	4	1	4	
40-49		2		
30-39				
20-29	1		1	1
	<u>19</u>	<u>19</u>	<u>19</u>	<u>19</u>



Table 21. Raw score distribution for comprehension in the remedial class and control group of the eighth grade on both the Sept. and May tests.

	Remedial class		Control group	
	Sept.	May	Sept.	May
210-219				
200-209				
190-199				
180-189				
170-179				1
160-169				1
150-159		2		1
140-149		1		
130-139		2		
120-129		4	1	3
110-119	3	3	2	1
100-109	1	3	1	7
90-99	7	2	7	1
80-89	3	2	2	2
70-79	3		3	2
60-69			1	
50-59	2		2	
40-49				
30-39				
20-29				
	<u>19</u>	<u>19</u>	<u>19</u>	<u>19</u>

Table 22. Raw score distribution for comprehension in the remedial class and control group of the ninth grade on both the Sept. and May tests.

	Remedial class		Control group	
	Sept.	May	Sept.	May
210-219				
200-209				
190-199		1		
180-189		1		
170-179				1
160-169				2
150-159	1	2	1	1
140-149		3		3
130-139	2	4	2	1
120-129	1	2	1	1
110-119	4	3	4	2
100-109	6	2	6	7
90-99	2	1	2	
80-89	3	1	3	1
70-79	1		1	
60-69	1	1	1	2
50-59				
40-49				
30-39				
20-29				
	<hr/>	<hr/>	<hr/>	<hr/>
	21	21	21	21

Table 23. Summary of statistical treatment of  
Tables 20 to 22.

		Median	P. E. Md.
7th gd. remedial--Sept.	20.60	80	4.01
7th gd. remedial--May	30.19	103	5.85
7th gd. control--Sept.	20.23	81	3.94
7th gd. control--May	31.76	91	6.17
8th gd. remedial--Sept.	18.09	92	3.52
8th gd. remedial--May	19.60	113	3.81
8th gd. control--Sept.	19.25	93	3.74
8th gd. control--May	26.22	106	5.09
9th gd. remedial--Sept.	20.74	104	3.83
9th gd. remedial--May	28.43	123	5.24
9th gd. control--Sept.	20.96	105	3.86
9th gd. control--May	30.94	110	5.71

As the population was small in each case, the above measures were computed from the original scores rather than from the frequency distributions.

In computing the difference between the median on the May tests and the median on the September tests, the probable error of the difference between the two medians and the critical ratio, the results in Table 24 were obtained:

Table 24. Difference between medians, probable errors of difference between medians and critical ratio. (Md<sub>1</sub> is the median on the May tests and Md<sub>2</sub> is the median on the September tests.)

	Md <sub>1</sub> -Md <sub>2</sub>	P.E. Md <sub>1</sub> -Md <sub>2</sub>	Critical ratio
7th gd. remedial	23	7.1	3.2
7th gd. control	10	7.3	1.4
8th gd. remedial	21	5.3	3.9
8th gd. control	13	6.3	2.3
9th gd. remedial	19	6.5	2.9
9th gd. control	5	6.8	0.7

The critical ratios of the seventh and eighth grade remedial classes approached the minimum critical ratio (four) which indicates statistical significance, so it might be said that the median gains of those two classes were slightly significant, statistically. However, the critical ratios of all three control groups and the ratio of the ninth grade remedial class all fell too far below four to indicate that the median gains were significant.

As the median gains of the control groups were not significant, it is impossible to say that the median gains of the remedial classes above the median gains of the control groups were significant.

Table 25. Comparative gains of remedial classes and control groups.

	Median gain in months	Mean gain in months
Seventh grade remedial	10	11.2
Seventh grade control	10	9.6
Eighth grade remedial	15	11.8
Eighth grade control	6	10.5
Ninth grade remedial	11	11.0
Ninth grade control	6	7.0

While statistical treatment failed to show that the gains were statistically significant (Tables 23 and 24), Table 25 showed gains for the remedial classes which appeared to be worth-while over the gains made by the control groups.

## SUMMARY OF RESULTS

1. A statistical analysis failed to show that the results were statistically significant. (Tables 17, 23 and 24)

2. There appeared to be a satisfactory reading situation in the elementary schools. (Table 9)

3. The effectiveness of teaching of reading showed a consistent decline in the upper grades. (Figure 1)

4. There appeared to be a satisfactory reading situation in the junior high school. (Table 14)

5. The remedial classes, after a semester of remedial treatment, appeared to show a worth-while gain over the control groups. (Table 25)

6. The rural students in the ninth grade showed a marked inferiority to the city students. (Table 19)

7. The emphasis upon reading consciousness without special remedial treatment was of doubtful value. (Table 18)

## ACKNOWLEDGMENT

The writer wishes to express his sincere appreciation to Dr. V. L. Strickland for his thoughtful help in the completion of this study.

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