

1962

An experiment with high school students in the development of reading skills through independent practice

<https://hdl.handle.net/2144/28164>

"Downloaded from OpenBU. Boston University's institutional repository."

*J. Keiser
Teele, M.C.
1962*

BOSTON UNIVERSITY
SCHOOL OF EDUCATION

Thesis

AN EXPERIMENT WITH HIGH SCHOOL STUDENTS
IN THE DEVELOPMENT OF READING SKILLS
THROUGH INDEPENDENT PRACTICE

Submitted by

Marilyn C. Teele

(A.B., Atlantic Union College, 1955)

In Partial Fulfillment of Requirements for
the Degree of Master of Education

1961

First Reader: Dr. Mabel S. Noall

**Associate Professor of Education
Director of Secondary Reading Clinic**

Second Reader: Dr. Helen A. Murphy

**Professor of Education
Director of Educational Clinic**

TABLE OF CONTENTS

CHAPTER	Page
I. STATEMENT OF THE PROBLEM	1
INTRODUCTION	1
The Problem	1
Delimitation	2
Definitions	4
JUSTIFICATION	4
Why Reading Ability Is Needed	5
Lack of Space and Teachers	6
Individual Differences in the Classroom	7
Reading Needs of High School Students	8
Summary	11
RELATED RESEARCH	11
Principles of Remedial Reading	12
Effectiveness of Remedial Instruction	14
Conditions of Learning	18
Distribution of Learning Time	21
Types of Materials	24
Methods of Instruction	27
Summary of Research	42
II. DESCRIPTION OF THE EXPERIMENT	43
PLAN OF THE EXPERIMENT	43
Population	44
Procedure	45
Methods	50
Materials	51
DESCRIPTION OF GROUP I AND GROUP II	56
Procedure	56
Findings	58
COMPARATIVE DATA ON GROUPS I, II, AND III	59
SUMMARY	66

CHAPTER	Page
III. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS	68
RESTATEMENT OF THE PROBLEM	68
DESCRIPTION OF PROCEDURES USED	68
REPORT ON PARTICIPATION IN EXPERIMENT	69
Number Participating	69
Average Amount of Practice	70
Differences Between Achievers and Non-Achievers	71
POST-TEST RESULTS	73
Comparison of Pre and Post Test Results on the Iowa Silent Reading Test, Advanced	73
Comparison of Workers and Non-Workers	77
Comparison of Test Results on All Three Groups on All Tests	80
Comparison of Grade Level Achieve- ments of All Three Groups	89
FINDINGS AND CONCLUSIONS	91
Results Indicated	91
RECOMMENDATIONS FOR FURTHER STUDY	94
BIBLIOGRAPHY	96
APPENDICES	102
A. Pre-Test Results in Percentiles	103
B. Post-Test Results in Percentiles	104
C. Schedule for Orientation Period	105
D. Materials Used in Orientation Period	106
E. Materials Used in Independent Practice	109

LIST OF TABLES

Table	Page
1. Data on the Comparison Between Three Groups: Uniform (Group I) <u>vs.</u> Individualized (Group II) <u>vs.</u> Independent (Group III) Practice . . .	60
2. Data on the Comparison of Iowa Silent Reading Test Sub-scores Before and After the Experiment for Independent (Group III) Practice . . .	74
3. Data on the Comparison of Workers <u>vs.</u> Non-Workers of Independent (Group III) Practice on Post-Test Results	78
4. Data on the Comparison of Before and After Test Scores on Uniform (Group I) <u>vs.</u> Individualized (Group II) <u>vs.</u> Independent (Group III) Practice	81
5. Data on the Comparison of Before and After Achievement of Uniform (Group I) <u>vs.</u> Individualized (Group II) <u>vs.</u> Independent (Group III) Practice	85
6. Comparison of Before and After Grade Scores on Uniform (Group I) <u>vs.</u> Individualized (Group II) <u>vs.</u> Independent (Group III) Practice to Show Differences in Gains	90

FOREWORD

Setting up a program for high school students with deficiencies in reading skills that would be completely individualized and which would be entirely independent of teacher supervision during the practice periods was the idea of Dr. Mabel S. Noall, Associate Professor of Education and Director of the Secondary Reading Clinic at Boston University.

Without her direction, skill in organization, and assistance, this thesis would not have been possible.

CHAPTER I

STATEMENT OF THE PROBLEM

1. Introduction

The Problem.--The purpose of this experiment was to determine whether or not high school students can actually improve, and how much they improve in relationship to two other teaching methods; namely, uniform classroom instruction and supervised individual practice, on the specific reading skills with which they have difficulty under a program of self-directed or independent practice after a brief orientation period in which a teacher outlines specific materials to be used and the ways to use them. It also attempted to show what percentage of the students failed to maintain systematic practice toward improvement and pointed out the distinguishing differences between students who actually improved and those who did not on such factors as intelligence, age, sex, and amount of practice.

The evidence was received from a comparison of data obtained from the results of alternate forms of three standardized tests--The Iowa Silent Reading Test,

Advanced, the Michigan Speed of Reading Test, and the Morrison-McCall Spelling Scale--given at the beginning and at the end of the nine-week experiment.

Delimitation.--A group of twenty-two students in seven grades representing fifteen high schools in the Greater Boston area were accepted for a summer course in reading at Boston University. A two-week orientation period was set up to meet Monday through Thursday evening for two hours under the direction of Dr. Mabel S. Noall and ten clinicians enrolled in the Boston University summer school teacher-training program.

During the first meeting a series of pre-tests were used to determine individual student skills and reading deficiencies. The next seven meetings were devoted to practice under teacher supervision with various multi-level materials and mechanical devices.

At the end of the 16-hour orientation period, each student was given a completely individualized reading program based upon needs determined by the pre-test data. Each reading program involved a specifically outlined daily schedule of at least 30 minutes of practice to be followed over the next seven weeks.

A post-testing period involving alternate forms of the same tests given at the beginning of the course

was held at the end of the seven-week practice period.

Data compiled from these tests were compared with pre-test data to determine growth in the following areas: (1) speed of reading, (2) comprehension, (3) vocabulary development, (4) organizational skills, (5) locational skills, and (6) spelling.

Data from this group were compared statistically with results from two groups taught the previous summer at Boston University by two different methods--one under uniform classroom instruction and the other in an individualized practice program. These two groups were proved statistically similar to the experimental group in such factors as age, sex ratio, intelligence and grade placement. The comparison of these groups was made to determine whether independent practice would result in similar gains in reading achievement as more orthodox methods of instruction.

No attempt was made to evaluate the materials used in the practice sessions although similar materials were used by all three groups.

Results were analyzed to determine which students made the most progress considering age, amount of practice, intelligence and the grade level of the achievers.

This experiment did not attempt to include practice in all of the reading skills but only in those

specifically shown to be needed by each student on the pre-test results.

The total practice time of the experimental group was outlined to be comparable with that of the two previous groups.

The experiment hoped to answer the following question: Can a group of high school students working independently on reading skills make significant progress in relation to similar groups working in regularly scheduled reading programs?

Definitions.--For the purpose of this paper, the group who were taught under uniform classroom instruction is referred to as Group I. The students working under individualized practice are referred to as Group II, and the experimental group who worked under independent practice is referred to as Group III.

2. Justification

Need for the Experiment.--Much has been written on the need for teaching reading to American high school students. Studies have centered on uniform and individualized methods of teaching reading disability cases. Experiments have been carried out to determine the amount of gain made over definite periods of time. Studies

have been executed to discover permanency of gain. The problems of distribution of time and massed time have been considered experimentally; yet very little study seems to have been given to the method of independent practice in reading instruction.

It is the purpose of this thesis to determine whether high school students can improve when under a self-guided independent reading program.

Why Reading Ability Is Needed.--"Reading is the cheapest and best tool we have at present for adapting education to individual differences. Varied skills in reading are basic to growth through reading."¹ Reading can spell the difference between success and failure not only in high school but also in college. Jex² found in a study over an eight-year period that to guarantee college success a student must possess power to achieve, not the potential to develop that power.

Noall³ says that a high school student needs the ability to read more today for five reasons:

¹Mabel S. Noall, "Automatic Teaching of Reading Skills in High School," Journal of Education (February, 1961), 143:3.

²Frank B. Jex, University of Utah Studies in Prediction of Academic Success, Education Monographs, Number 1, University of Utah, 1957.

³Noall, op. cit., p. 6.

(1) to achieve in crowded and understaffed school situations, (2) to gain admission and success in college, (3) to qualify for satisfactory and sustained employment, (4) to maintain communication with others, and (5) to be selective under a barrage of hidden persuaders that surround him today.

Lack of Space and Teachers.--Let us examine a few of these reasons in view of recent statistics. There is a growing need for both space and teachers due to the increasing school population.

The NEA Research Bulletin¹ of February, 1960, reports that in public high schools the 1959 to 1960 enrollment was 5.1 per cent higher than the 1958 to 1959 enrollment. The enrollment for the previous one-year period had already increased 10.7 per cent. Richey² confirms these statistics in his report of the number of high school students over the last ten-year span.

The methods to care for this increase in the number of students plus the increasing percentage of those attending school must be met.

In addition to this problem there is an increasing shortage of teachers. In 1958 the NEA Research

¹"Spotlighting Public Education in 1960," NEA Research Bulletin, (February, 1960), No. 1, 38:18-22.

²Herman G. Richey, "Population Change," Encyclopedia of Educational Research (New York: Macmillan Company, 1960), pp. 1031-38.

Bulletin¹ indicated that nine states reported a small shortage of rural secondary school teachers; 36 states, some shortage; and one state, a large shortage. In addition 27 states reported a small shortage of urban teachers; and 21 states, some shortage.

Individual Differences in the Classroom.--Studies have proven that in every classroom there are differences which present problems to a teacher. Noall² lists these differences as: "Intelligence, degree of reading proficiency, personality structure as it related to dynamics and level of aspiration, working speed, progress rates, areas of weakness, and interests."

Umstattd and Thornton³ compiled a table on I.Q.'s in the high schools which represented scores drawn from more than 10,000 children at each grade level. In all grades there was a range from I.Q.'s of 50-59 to those of 140-149. Although the average centered close to 100

¹"Statistics for 1957-58," NEA Research Bulletin (February, 1958), No. I, 36:9-12.

²Noall, op. cit., p. 7.

³J.G. Umstattd and Robert D. Thornton, "Secondary Education -- Student Population," Encyclopedia of Educational Research, Third Edition (New York: Macmillan Company, 1960), pp. 1272-1282.

I.Q., the middle 50 per cent had a spread in potential reading performance of four to five grade levels.

The spread of reading achievement can be even greater within a class than the spread of I.Q. On the results of the Stanford Reading Tests, Intermediate and Advanced Levels, given to 29,348 eighth-grade junior high students in New York City by the Board of Education, Bureau of Educational Research,¹ The results show that 11.2 per cent scored grade 4.9 or below, and 7.8 per cent scored grade 12.0. The middle 50 per cent of the scores were distributed over nearly four reading grades.

Authorities² also feel that children vary in their progress rates thus making provision for these individual differences important.

Reading Needs of High School Students.--In a study reported in 1959 Tormey and Patterson³ found that two of

¹Board of Education, City of New York, The Retarded Reader in the Junior High School, Bureau of Educational Research, Publication Number 31 (September, 1952).

²Arthur I. Gates, "What Research Says to the Teacher," Teaching Reading, Department of Classroom Teachers, American Educational Research Association (June, 1953), pp. 10-11.

³Mary K. Tormey and Walter G. Patterson, "Developmental Reading and Student Evaluation," Journal of Developmental Reading (Winter, 1959), 2:30-43.

the major criticisms of the high schools of America are poor reading and poor study skills. Students needing these skills who are provided with instruction improve significantly.

Broening¹ surveyed 20,000 students in grades seven through twelve while analyzing a million and a half tests. According to her report, skills in which high school students did not score well included discovering the central idea, outlining, skimming, and answering specific factual questions.

In a similar study of high school reading difficulties Kinder² found that the most frequent errors were those related to organizational skills, particularly those of recognizing main ideas and unaided oral and written recall of main ideas and details.

If we are going to meet individual differences Noall³ says, "Ways must be found to guarantee learning with the individual working independently."

¹Angela Broening, "Abilities Which Contribute to Effective Reading," Education (September, 1941), 62:11-17.

²Robert F. Kinder, "Types and Frequency of Difficulties of Secondary School Reading Skills" (Unpublished doctoral dissertation, Boston University School of Education, Boston, 1957).

³Noall, op. cit., p. 3.

Since efficient reading and study skills are lacking in so many of our high school students, instruction in these areas is essential. Yet Hunt¹ insists that remedial classes do not provide for all those who need help. "A co-ordinated and concentrated program in which all staff members participate and in which developmental reading is the core, is essential if any appreciable school-wide gain in reading is to develop."

If an all-school reading program is what is needed, there must be adequate personnel and training to carry on such a program. In a questionnaire² sent to 88 junior high school principals in May, 1950, 60 per cent of the principals felt that teachers were not prepared to teach basic reading skills, 29 per cent felt that only some teachers were prepared to teach reading, and only 10 per cent felt that teachers were ready for this responsibility.

¹J. T. Hunt, "What High-School Teachers Should Know about Individual Differences in Reading," School Review (October, 1952), 60:423.

²Board of Education, City of New York, op. cit.

Summary.--Considering the factors of overcrowded classrooms, too few teachers, the deficiencies in the reading and study skills coupled with the apparent lack of preparation on the part of teachers to instruct in these areas, the extreme difference in I.Q. and reading achievement found in the ordinary high school classroom as well as the problem of variance in progress rates and individual differences in such areas as the time spent to complete a set of exercises; if an independent plan of reading improvement will work, then part of our reading problems for the future would be solved.

3. Related Research

Studies prove the need for instruction in the reading skills and the wide range of individual differences found in each class. Yet what does research say of the principles, conditions, effectiveness, and methods to be used in such instruction?

The following review of research is divided into six sections; namely, (1) Principles of remedial reading, (2) Effectiveness of remedial instruction, (3) Conditions of learning, (4) Distribution of learning time, (5) Materials to be used, and (6) Methods of reading instruction.

Principles of Remedial Reading.--The skill of good remedial instruction differs little from expert classroom practice. Cilley¹ concludes that it lies in making sure that the interest of the student for his subject does not waver, that the atmosphere is conducive to progress and without undue strain, and that the student feels that both he and his progress are important in the eyes of the teacher.

Mr. Roth² has reached the conclusion from the results of a myriad of studies to identify causes of reading disability that the causes are multi-varied. Yet he concludes that,

The motivation of students seeking remedial reading is either for true remediation or to maintain self-concepts. Those who seek remedial reading to maintain self-concepts are either trying to "prove to themselves" that they can gain from the experiences or that they cannot gain. Students whose motivation is reading improvement are aware of their motives; students whose motivation is to maintain self-concepts are not aware of their motives.

A remedial program is a stimulus; the results of the program are a response. A structured program allows the motivation to determine the result; an unstructured program is a stimulus situation or a background in which

¹Ida May Cilley, An Evaluation of Three Time Schedules in Remedial Reading (Unpublished Master's thesis, Boston University, Boston, 1958).

²Robert M. Roth, "A Theory of Voluntary Remedial Reading Programs," Journal of Developmental Reading (Winter, 1951), 4:87-93.

the student himself is the direct stimulus.

Schubert¹ outlines 12 sensible steps in remedial reading as follows:

1. Select and concentrate on retarded readers whose mental ages are considerable above their reading ability.
2. Try to uncover and remove the cause or causes of reading deficiency. Briefly these include physical defects, emotional maladjustments, and unfavorable home and school environments.
3. Catalogue each student's specific weaknesses through tests, observation, and conferences.
4. Recognize that extreme cases do exist which are beyond your ken.
5. Immediately establish rapport. Let them feel they are worth helping and that they can overcome their difficulties.
6. Restore confidence and dispel fear of failure by introducing easy materials coinciding with their individual interests.
7. Eliminate boredom by having the students engage in several kinds of activities during each period and by turning drills into game and play activity.
8. Cooperation of the parents is necessary. Parents or siblings may interfere by tutoring. This is because they lose patience easily and do not know about proper methodology.
9. Use progress charts of all kinds and descriptions.

¹Delwyn G. Schubert, "12 Sensible Steps in Remedial Reading," Clearing House (October, 1953), 28: 80-81.

10. Meet remedial students at least twice a week but avoid conflicts with cherished activities.
11. Try to keep the remedial group free from stigma.
12. Have as the most basic objective that of developing in the students a genuine interest in reading.

Johnson¹ states that,

Investigators who have studied the incidence of remedial reading problems in the public schools have used different criteria for selecting those children requiring special attention. Some authorities suggest that a comparison of the individual's score that is expected of pupils of his age or his grade level is a useful and valid method of determining whether the child has a reading disability . . .

The easiest and most effective criterion to use for the selection of remedial reading cases is the combination of reading level significantly below mental grade level.

Effectiveness of Remedial Instruction.--In a study by Dobbins,² she established the fact that it is possible for students with serious reading difficulty handicaps to make gains. Even rapid gains have been shown by intensified reading programs. Some trends indicated by her

¹G. Orville Johnson, "A Critical Evaluation of the Problem of Remedial Reading," The Elementary School Journal (January, 1957), 57:217-218.

²Elizabeth M. Dobbins, A Study of Reading Achievement Made Under Remedial Instruction (Unpublished Master's thesis, Boston University, Boston, 1951).

study are:

. . . that, although reading disability does persist for some pupils, all children were able to make some progress with remedial help.

. . . that children who were failing to make progress in reading did become more effective readers as a result of remedial instruction and made progress in varying degrees.

In a study made by David¹ 69 unselected seniors were placed in matched groups. One period of 55 minutes each week for 17 weeks was devoted to instruction in reading. The control group participated in the usual classroom experience while in the instructed group techniques and materials were employed to demonstrate the effectiveness in improving reading habits.

A comparison of the improvement of the instructed group and the control group in total comprehension and rate of silent reading showed the significance of the greater gains made by the instructed group. There was an increase of 25 per cent in the rate of reading over the original score, and an increase of about 30 per cent was noted in comprehension. "It takes the child," says David, "over two years to make the gain in comprehension that the instructed group made in 17 weeks." The mean reading

¹Curtis H. David, "Improving Reading Ability of High School Seniors," California Journal of Secondary Education (November, 1937), 12:424-429.

rate increased from 250 to 406 words per minute, or a mean gain of 156 words per minute.

In a study by Anderson¹ made on reading programs in California secondary schools, she reports,

With this reading program we have seen students make an average stride of one and a half to two years in one semester's training, while many individual cases have made far greater gains. From our experience we know that this program has benefited poor students who were total non-readers, below average, average, and superior students alike.

Numerous studies through the years have presented evidence of the value of training in reading among high school students by showing "that students who benefit by special training in reading either hold their new levels of accomplishment or continue to improve."²

Evidence by Lewis³ has also been published to prove that remedial reading yielded "significant gains in reading and improved academic adjustments" on the part of students thus justifying the continuation of reading classes in the high schools.

¹Ruth H. Anderson, "Aspects of Developmental Reading," California Journal of Secondary Education (1942), 17:472-474.

²Thornton C. Blayne, "Retention of Skills Acquired in Developmental Reading Programs," School and Society, (January 12, 1946), 63:37-39.

³Martha Lewis, "Improving the Reading Ability of Vashon High School Students," The Saint Louis Public School Journal (September, 1945), 1:16-20.

In a study on a college reading program Beasley¹ reports "real gain and permanence of gain after three months of instruction, involving use of mechanical and non-mechanical devices, given to 144 students during 36 class hours, supplemented by 24 hours of individual and small-group help."

Beasley² also states, "Study proves that reading ability of college students can be materially improved through appropriate training and that the improvement made is retained after three to six months. Retention of gains was greatest among those ranking highest in reading ability."

McCullough³ warns,

Throughout many of the studies consulted there runs the thread that we get what we work for consciously; that if both students and teacher are aware of specific goals, those specific goals are more apt to be reached. Along with this finding, however, runs the danger that narrowly conceived goals produce limited results.

¹Charles E. Beasley, Jr., "A Freshman Reading Program," Journal of Developmental Reading (Winter, 1959), 2:23-29.

²Ibid.

³Constance M. McCullough, "What Does Research Reveal about Practices in Teaching Reading?" English Journal (November, 1957), 47:475-490.

Conditions of Learning.--Five factors seem to be involved in the conditions of learning as stated by Noall.¹ They are: readiness, motivation, associative factors, reinforcement, and transfer of the training.

"Readiness involves a mind-set or intent to learn." Therefore the students must understand what skills they need to learn and how the procedures and materials available to them can teach those skills. Students must also realize why these skills are important to them.

Motivation can be achieved by various means. Among those paramount to reading improvement are competition, success, novelty and change, social factors, and pressure.

"Competition with self is always fair and can be accomplished by means of achievement charts," says Noall.² The keeping of charts can also be a graphic representation to the student of his success.

A study conducted in 1956 by the New York City Division of Education³ in the investigation into

¹Noall, op. cit., p. 9.

²Ibid., p. 10.

³Harry F. Silberman, Studies of Teacher: Behavior Effects of Praise and Reproof on Reading Growth in a Non-Laboratory Classroom Setting. Division of Teacher Education, Board of Higher Education of the City of New York, Research Series 33, (June, 1956).

praise-reproof and its effect on reading improvement brought this interesting sidelight. Although no correlation seemed to exist between teacher patterns of praise and reproof and student gains in reading, the researchers did find that students who operated in a changed environment did make significantly higher gains than those who operated in the ordinary classroom situation. This shows the importance which can be attached to change or variety not only in programming but which also can be carried over into materials and reading activities which can disrupt the status quo as strong motivating devices.

The sharing of reading experiences through panel discussions, "buzz" sessions, setting up of displays both by teachers and by students, and oral dramatizations are just a few examples cited by teachers in practice which can bring motivation through novelty or a change in the regular scheduling.

The introducing of new or attractively mounted activities can also produce good effects in reading programming through motivation by change.

The teacher herself must be up-to-date on current materials and topics and know her students, their abilities, interests, and hobbies well, to gauge activities, "to produce not only quantity but also quality in

the motivation force."¹

Social factors include both student-teacher and student-student relationships. As a conclusion of research Noall² stated, that high school leaders should, if at all possible, work in the reading program so that students can identify socially with these recognized prestige figures. Most students tend to relate their ideals with the teacher so personal recognition by the teacher is also important to success.

Two types of pressure seem to stimulate motivation, time-pressure adjustable to the individual exercises and needs of the student and pressure as a result of stimulating ideas. Another element necessary to learning is that of transfer.

Noall³ states,

Transfer seems to occur more reading when there is close similarity between the learning situation and the way that the learning eventually will be used. Also there is more likelihood of transfer if responsibility for decisions in learning have been with the student . . . Transfer will probably come

¹L. L. Ort, "Reading Is Catching When You Know Their Dreams, Interests," Clearing House (December, 1950), 25:242-44.

²Ibid.

³Ibid., p. 11.

about more easily if there are occasional shifts to situations where the student must judge the outcome and where no answers are given until a later test period . . . It is probably best, too, if the practice sometimes implies general principles to reinforce the possibility of inferential thinking.

Distribution of Learning Time.--Davis¹ states that there are three factors involved in the problem of distribution of practice, namely, (1) the length of the practice periods, (2) the time interval between practice periods, and (3) the length of time during which practice is continued.

Griffith² cites that a major portion of both theoretical and experimental facts show that effort distributed over a period of time is an efficient way of engineering the process of learning. He believes that it usually leads to better results than concentrated effort. He continues:

The speed of learning and the degree of retention will depend on the distribution of learning effort. This fact holds true, in particular, of the early stages of learning. A review of familiar material often required less distribution of effort.

¹George A. Davis, Educational Psychology (New York: McGraw-Hill, 1948), pp. 298-99.

²Coleman R. Griffith, Psychology Applied to Teaching and Learning (New York: Farrar and Rinehart, Inc., 1939), p. 198.

Woodworth¹ points out that experimenters have almost completely discovered a saving of learning time when it is distributed over several sittings (spaced or distributed learning) in comparison with results obtained when the same total learning time is concentrated into one continuous sitting.

Guthrie and Powers² agree with this by reporting:

Many experiments with both animals and persons appear to give the advantage to distributed practice periods with intervals as long as twenty-four hours between. . . . In the practice of many skills there appears to be a law of diminishing returns. The rate of improvement is higher at the beginning of practice and diminishes as practice is continued until in a protracted session a point is reached beyond which no improvement takes place.

In their Forty-first Yearbook, Part II, "The Psychology of Learning," the Committee of the National Society for the Study of Education (1942) says:

Psychological experimentation has shown short work periods to be more effective than long ones. Subjects do more work per minute when set to work for a short interval than when set to work for a long time.

Cruze³ reports:

¹Robert S. Woodworth, Experimental Psychology (New York: Henry Holt and Company, 1935).

²Edwin R. Guthrie and Francis Powers, Educational Psychology (New York: The Ronald Press Company, 1950), pp. 147-48.

³Wendell W. Cruze, Educational Psychology (New York: The Ronald Press, 1942), p. 306.

Relatively short practice periods, well distributed over long intervals, seem to represent the most economical arrangement of time for study. A considerable portion should be spent in verbalization and recitation. An attempt should be made to improve pupil study habits. This may be accomplished by diagnosing weaknesses, and planning and executing a definite remedial program. Organization and planning give promise of great dividends in the efficiency of study.

White¹ believes that learning does not always follow practice. She lists the following requirements which must be met to produce the best results:

1. Its effects must be pleasurable or meet a need of the learner.
2. The learner must be aware that the practice is meeting a specific need.
3. Periods of practice should be distributed over a period of time.
4. Short practice periods are more effective than very long ones.
5. Practice periods should not be so close together as to give the learner no chance to assimilate what he has learned.
6. Practice materials should be suited to the ability of the child.
7. To be most effective, practice must provide for variety of responses, and it must be presented in a variety of ways.

¹Virginia L. White, An Analysis of Reading Workbooks for Grades 4, 5, and 6 (Unpublished Master's thesis, Boston University, Boston, 1957), p. 15.

Types of Materials.--Since "there is a wide range of ability in reading in any secondary school class,"¹ and the need for provision for individual differences in reading skills has been recognized for a long time,² Durrell³ states, "The instructional material must be on the right level for the child. . . . Although it is easy to remember the needs of the slow learner, it is equally important that the rapid learner be challenged by reading tasks."

Materials to be used in independent practice must fulfill certain characteristics. Noall⁴ states, "If possible, the material should have some kind of identification with student goals."

Materials should also be prepared on a multi-level sequential pattern with individual job sheets interchangeable at any one level so that students could work at

¹The Commission on the English Curriculum of the National Council of Teachers of English, The English Language Arts in the Secondary School, "Developing Competence in Reading" (New York: Appleton-Century-Crofts, Inc., 1956), p. 162.

²Olive S. Niles and Margaret J. Early, "Adjusting to Individual Differences in English," Journal of Education (December, 1955), 138:3.

³Donald D. Durrell, Improving Reading Instruction (Yonkers-on-Hudson, New York: World Book Company, 1956), p. 5.

⁴Noall, op. cit., p. 9.

their own pace and with as many exercises as necessary to sustain competence. Answer sheets have to be readily available as well as "optional tests which could be taken at points to demonstrate competence for moving to the next level with alternate tests for a future use if the student failed to pass the test the first time."¹

Record sheets for ready reference and easy maintenance are necessary to record both time and accuracy.

Niles and Early² feel that "almost completely individualized instruction can be carried out by the use of job sheets."

In a study made by McGlinchey³ two groups of eighth-grade language arts classes were used to compare the effectiveness of teaching between the workbook method in which every pupil is assigned a workbook on a certain grade level and follows a predetermined order in using uniform procedure and the job sheet method in which workbooks are cut up into units with a variety skill approach

¹Ibid., p. 11.

²Niles and Early, op. cit., p. 11.

³Barbara M. McGlinchey, "Cut-Up Workbooks Versus Bound Workbooks in the Development of Reading Skills," (Unpublished Master's thesis, Boston University School of Education, 1961).

on progressive levels of achievement.

Results seem to indicate that the use of cut-up workbooks on which students can work with immediate knowledge of results as a reinforcement of learning are more effective in teaching reading skills than the use of the same material in workbook form on such skills as speed and comprehension, locational skills, interpretation of material, organization and sequence of ideas, directly stated fact, and inference.

The workbook method, however, made considerably higher gains in vocabulary than did the job sheet method in using the McCall-Crabb Standard Test Lessons in Reading, which were the bases of the study.

Variety of materials can be a motivating force. Durrell¹ says, "Variety in lessons is important in maintaining interest in skills learning. Even simple changes tend to relieve monotony . . ."

Self-scoring is another important factor in materials because the "immediate knowledge of results is a reinforcement of learning."

Noall² states, "When a student is told immediately after each question whether his answer is correct, the

¹Durrell, op. cit., p. 140.

²Noall, op. cit., p. 36.

fact that he knows what he is doing helps him to steer his path closer to the desired goal." Noall¹ continues, "It is a serious handicap when materials are not self-scoring because the reinforcement of learning that immediate knowledge of results can give is lost if the student waits for the teacher to score his exercises."

Another reason for not using the lock-step materials presented in organized workbook materials available on the market is the typical frustrating situation experienced by both students and teacher when rapid workers complete an assignment and must sit and wait for the slower students to finish. In some cases the slower student may give up instead of making himself the object of the whole class's attention while he tries to complete the material.

Methods of Instruction.--Varied methods for the teaching of reading above the elementary level have been the subjects of experimentation. Highlights of the most prevalent ideas over the last few years will be included in this paper.

¹Ibid., p. 41.

Authorities disagree as to which methods of instruction produce the best results. In considering two of the most popular methods--uniform instruction and individualized programming--Fox and McCullough¹ speak out strongly.

Fox says that more than anything else then, individualized reading means clearing the lines of communication between teacher and children. She feels that when children have freedom in both choice of reading books and work exercises to develop reading skills that they improve more.

McCullough, on the other hand, feels that tests to measure the validity of an individualized program are not reliable and that it is risky to use such an approach.

Mr. Roth² feels that if students can work together in pairs or small groups in an unstructured program they tend to show more gain or be more successful. He believes that "when a student's motivation is improvement in reading, he will gain as much from a structured as from an unstructured program." Yet when his motivation is failure

¹Lorene K. Fox and Constance M. McCullough, "Individualizing Reading," NEA Journal (March, 1958), No. 3, 47:162-63.

²Robert M. Roth, "A Theory of Voluntary Remedial Reading Programs," Journal of Developmental Reading (Winter, 1961), 4:87-93.

or success in its own right rather than the improvement of reading ability the student will tend to achieve his goal in a structured program. In an unstructured program the student will experience anxiety and pressure and will drop out if not aided in these feelings.

In a study made by Safford¹ of 183 children in grades three to six an analysis was made on the scores of the reading section of the California Test Battery by pupils in seven classes who had been taught by the individualized teaching technique to determine the extent of growth as compared with that of pupils taught by other techniques in the school system. The majority of the 183 children made less than average gains in reading during the experimental year although they did improve about the same amount in vocabulary and comprehension.

In an experiment in Michigan by Bennett² three methods of reading improvement were used in an English class. One group studied the regular syllabus which outlined exercises in reading. A second group were given freedom in reading depending on intellectual curiosity

¹Alton L. Safford, "Evaluation of an Individualized Reading Program," The Reading Teacher (April, 1960), 13: 266-70.

²A. L. Bennett, "An Experiment in Reading," Michigan Education Journal (January, 1953), 30:302-303.

with very few requirements for outlining and written analysis, but with much oral analysis and critical discussion. The third group were given vigorous training in precise writing, outlines, exercises, and tests of all types.

On the pre and post test results of the Diagnostic Reading Test, group three made the best showing on everything but vocabulary. Group one was the poorest on all skills except speech. Group two showed slightly better gains in vocabulary. The study indicates that the differences in methods brought about different types of growth.

In a controlled experiment involving three second-term high school classes--one remedial reading class, one remedial drill class, and one control class, Goldberg¹ aimed to determine the relative effectiveness of wide reading or intensive reading in improving reading ability. He found that the group which used wide reading made the largest total progress in reading ability; however, the drill method also made definite contributions. He concluded that reading comprehension can be improved with equal

¹Murray A. Goldberg, "Can Reading Ability Be Improved More Effectively Through Wide Reading or Intensive Drill?" High Points (February, 1946), 28:21-22.

effectiveness through either method.

Gray¹ feels that this article isn't sufficiently well supported to be thoroughly convincing.

Henry and Lauer² experimented with four methods of increasing speed with college students: "(1) verbal instruction without definite practice; (2) Metron-O-Scopic practice; (3) practice on mimeographed subject matter; and (4) use of self-improvement forms."

Of the total methods, 274 students made gains of "from 12.6 to 18.3 per cent." Test-retest comparisons, without systematic instruction or motivation intervening showed 9.3 per cent improvement. Further analysis led to three conclusions: "(1) Motivation is apparently responsible for a large part of the improvement in speed; (2) The more nearly conditions approximate actual study the greater will be the improvement; (3) Artificial devices for improvement of reading are perhaps more spectacular than useful."

¹William S. Gray, "Summary of Reading Investigations July 1, 1946 to June 30, 1947," Journal of Educational Research (February, 1948), 41:416.

²Lyle K. Henry and A. R. Lauer, "A Comparison of Four Methods of Increasing the Reading Speed of College Students," Proceedings of the Iowa Academy of Science (1939), 46:275-76.

Leavell and Wilson¹ present the results of a controlled experiment including 290 low sophomore pupils to determine the relative effectiveness in improving reading efficiency of (a) two types of mechanical devices, (b) direct teaching of reading skills, (c) a guided free reading program, and (d) a certain prescribed course of study.

They found that a combination of vocabulary study, acceleration training and guided free reading "provide a medium for interesting and worthwhile reading experiences."

In another study done by Wilson² 270 tenth-grade students were divided into six groups and received the following types of training: with accelerators; with tachistoscopes; with both direct instruction in reading; a guided free reading program; and the prescribed course of study.

Test scores did not provide conclusive evidence in favor of any one plan. The comparative standing of the groups varied with the reading test used.

¹Ullin W. Leavell and Grace E. Wilson, "Guided Free Reading Versus Other Methods in High School English," Peabody Journal of Education (March, 1956), 33:272-80.

²Grace E. Wilson, "Accelerator Training," Peabody Journal of Education (July, 1956), 34:9-18.

Durrell¹ says, "The chief objective in education is the intelligent self-direction of living." Automatic teaching would fulfill this objective.

Noall² says, "To qualify as automatic teaching, a program must be self-pacing with a flexibility that reflects the individual student's level of achievement, work speed, rate of improvement, and skill needs."

She continues, "Automatic teaching implies multiple track materials, arranged in graded sequence. These materials must give immediate knowledge of results to the student and vary the task in line with the student's performance."³

In an experiment conducted by Fallon and others,⁴ in Lynnfield High School in 1960 a multiplicity of multi-level sequential materials were arranged in organized patterns so that a large group of students would practice, after initial orientation, various reading skills with provision for individual differences. The group met in

¹Durrell, op. cit., p. 13.

²Noall, op. cit., p. 3.

³Ibid.

⁴Eleanor Fallon and others, "Mass Differentiated Reading Skills Instruction in High School" (Unpublished Master's thesis, Boston University School of Education, Boston, 1960).

the school cafeteria three times each week for a seven week period.

A comparison of the pre and post testing results showed that, "The student's test scores after the experiment were significantly better (at or above the one per cent level) on all instruments used."¹

In another experiment set up at Boston University in the summer of 1960 as part of the summer teacher-training program, two comparable classes of approximately twenty-five students each were given instruction in reading skills over a period of six weeks using two methods.

A variety of similar materials was used by both groups. One group worked under a series of self-directed individualized practice while the other group were taught by uniform class instruction. More detailed description of these two groups will be included in Chapter II.

Findings, however, indicated that on the post tests given to the two groups after 30 hours of work that the average improvement was approximately 2.8 grade levels with the uniform class instruction group showing slight advantage on the Iowa Silent Reading Test and the individualized group gaining more on the Michigan Speed of

¹Noall, op. cit., p. 25.

Reading Test.

Noall¹ states,

This would indicate that a self-directive individualized program for the development of reading skills is possible and valid. The best reading developmental program probably lies in a combination of these two methods with skills being developed on the individualized basis and appreciation, integration, and transfer of skills by the unified classroom.

Bennett² compared the performance of three groups of college freshmen on the Trigg's Diagnostic Survey Test after a semester of instruction during which one group enjoyed free reading; one group practiced making summaries, writing outlines and vocabulary drills; and one group emphasized getting the meaning and getting the main point. In the first group the chief reliance for results was based on interest, curiosity, and love of reading. Group two had regular instruction on reading skills, especially on making outlines and precise writing. Group three received brisk training in basic attitudes and skills involved in efficient reading.

Tests given at the end of one semester showed that group three made the best showing in everything except vocabulary, while group one showed the least improvement.

¹Ibid., p. 30.

²A. L. Bennett, "Two Experimental Groups in Reading," College English (January, 1954), 15:233-35.

Conclusions stressed that the product of teaching is influenced largely by what is emphasized.

Watts¹ conducted an experiment with 20 college students 15 of whom were freshmen who ranked with a median at the 14th percentile on the Iowa Silent Reading Test. Additional testing was done with the Cooperative English Test, C², Form 2. Six weeks were spent in studying case histories, under a timed reading situation, of students with reading problems. Students discussed and analyzed their own weaknesses. The remainder of the semester was devoted to individual programs of correction and the development of reading techniques.

Motivation within the group was high. On the post-testing which climaxed the semester's work all had improved in both speed and comprehension, some as much as to the 33rd percentile and others to the 45th percentile. The report did not include a control group.

A study by Weeks² reported a fresh approach to the situation. Two composition classes at the University of

¹Phyllis W. Watts, "An Application of Clinical Diagnostic Techniques in the Classroom Situation for the Improvement of Reading at the College Level," Journal of Educational Research (March, 1949), 17:513-24.

²Lewis E. Weeks, Jr., "Speeding Up Reading: A Self-Help Program for College Freshmen," Journal of Developmental Reading (Autumn, 1959), 3:35-42.

Maine for two successive years, 1956-57 and 1957-58 were involved in the program which, in the words of the author, was "an approach to the reading problem on a modest and limited experimental basis with gratifying results."

The program involved 45 students but complete records were kept on only 27. However, the records for the other students did not show deviations. The program was designed primarily to help students increase their speed. It involved very little class time and "a relatively small amount of study time on the part of the student."¹

The Diagnostic Reading Test, Survey Section, Form A (From Grade 7 through College Freshman Year) was given at the beginning of the year with a different form administered at the end of the year. The test is designed to measure speed and comprehension of story-type material, vocabulary and comprehension of study-type material.

Exercises taken from Norman Lewis' How To Read Better and Faster designed to increase speed, comprehension, and vocabulary were used. Assignments were made and briefly explained during class time. Progress results were also charted during class time. Students were on

¹Ibid.

their own except for suggestions, and reading exercises were done in addition to regular assignments. Special reading lists of fiction were drawn up and reports written in class on prescribed days were counted as part of composition work.

The groups were composed of "sub-college level students who in general are particularly ill-prepared in reading and writing," the author continued. The students were willing and eager to learn but skeptical at first.

Results on the post-testing showed a median increase in speed based on standardized test scores of from 229 wpm to 334 wpm, an increase of 49 per cent thus raising the median from the 14th percentile for college freshmen to the 79th percentile.

When compared at the end of the year with two other freshmen classes of higher ability who were not in the program, these students showed marked increases in rate. Vocabulary and comprehension before and after training stayed consistently near the 19th percentile in all cases. There had been no loss of comprehension as a result of the increase in speed. No training or emphasis had been given on the skills of vocabulary and comprehension.

Conclusions noted that, "Even with below average groups, rather remarkable improvement in rate of reading is possible solely through the students' own efforts under some slight guidance and encouragement."¹

Students in evaluating the program recommended its continuance since they found that they could do half again as long assignments or complete their assignments in two-thirds of the regular time.

Weeks² continues, "The better and more conscientious students--the two not always the same--made greater improvements than did the others."

However, it must be noted that since Weeks measured improvement in percentiles, this conclusion may not be valid. "The better and more conscientious students" were probably operating in the middle range of percentiles where distance from one percentile to the next is much smaller than it would be at the extremes where the poorer students would be working.

The implication of this statement is that both poor and better students can improve greatly "which supports the oft-presented view that better students are

¹Ibid.

²Ibid., p. 42.

loafing along unchallenged and are working below capacity."¹

A recent study of 33 eighth-grade students in Long Island, New York, was reported by Dr. Harold Herber.² The purpose of the study was the answer to the following questions:

(1) Does self-improvement practice on specific reading skills and with very limited teacher direction, result in actual improvement of those skills? (2) What is the percentage of students failing to maintain efforts toward self-improvement? (3) Of the students involved in the experiment, were there any distinguishing differences between students who actually tried self-improvement and those who did not: were they better readers, were they of higher intelligence? (4) Did the workers make better gains than the non-workers over the same period of time?

Students were selected on the basis of test results from the Iowa Silent Reading Test. Students scoring at or above the 60th percentile were examined to determine those showing low achievement on four sub-tests. Each student was given instruction sheets for the skills he needed. These sheets included the materials to use, practice methods and reasons for practice. Practice time was set for fifteen minutes per day for five weeks.

¹Ibid.

²Harold L. Herber, "Developing Students' Reading Power Independently through Guidance," (Unpublished report, Floral Park, Long Island, New York, 1961).

Herber¹ reports, "During the experiment nine students dropped out and did not appear for post-testing. Of the 24 students taking the post-tests, nine indicated that they had not participated in the experiment."

At the end of the experiment students were divided into two groups: workers and non-workers. Tests of significance applied to the two groups measured differences in general reading achievement, I.Q., and test scores on the Iowa Silent Reading Test; Advanced Form.

Findings indicated that students who practiced skills in "Directed Reading" and "Use of Index" showed significant gain in achievement (at the 5 per cent level), but showed no gain on "Rate of Comprehension" and "Alphabetizing."

Herber² continues,

Of the thirty-three students who began the program, 56% did not participate, 15% practiced only one week; 7% practiced only two weeks; 4% three weeks and 18% practiced the full five weeks. Of the twenty-four students who appeared for post-testing, 42% had not participated; 21% had practiced only one week; 8% had practiced only two weeks; 4% had practiced three weeks; 25% the full five weeks.

Workers showed gains in "Alphabetizing" and "Use of Index" while non-workers achieved higher on "Rate," although

¹Ibid.

²Ibid.

there was no difference in intelligence between the two groups. Workers also scored significant differences on "Directed Reading."

No statistical data were included in the report.

Summary of Research.--Varied single methods and combinations of methods seem to have been proved effective in increasing reading achievement whenever there was a drive on the part of both students and instructor to improve. Limited experimentation seems to indicate that independent practice will result in gain if students are sufficiently motivated, know specifically what skills they need to develop, have suitable materials with instructions as to their use, and are willing to practice at frequent intervals.

More study, however, is indicated on the method of independent practice.

CHAPTER II

DESCRIPTION OF THE EXPERIMENT

1. Plan of the Experiment

This study, "An Experiment with High School Students in the Development of Reading Skills through Independent Practice," followed a sequence of nine steps. Twenty-two of the students in the Greater Boston area who had applied for a course in reading at Boston University were notified of their acceptance early in the spring. These students were then compared statistically with two other study groups taught under different methods the previous summer. Ten teacher-clinicians who had registered to assist in the course met for ten hours during the week prior to the experiment for orientation on the plan to be followed. The next step involved pre-testing of the experimental group to determine deficiencies in skills. Work stations in two large adjoining rooms at Boston University were set up with appropriate materials and mechanical devices.

A time-schedule was arranged for both clinicians and students to follow during the remaining periods of the

orientation. At its conclusion each student was given a reading kit with appropriate materials and a practice schedule to follow for the next seven weeks. At the end of the experiment a battery of post-tests was administered, and the results were compared statistically with pre-test scores as well as with the other two study groups to determine the gain achieved by independent practice versus uniform or individualized practice.

Population.--The group selected for the experiment represented fourteen boys and eight girls from grades seven to college freshmen in attendance at fifteen different schools scattered over the Greater Boston area.

Most of these students were still attending classes; in fact, several of the students missed the last session of the orientation period to attend their own graduation exercises.

The group also represented a variety of socio-economic backgrounds.

That motivation was high can be seen in the facts that many students themselves had requested aid and secured parental consent to be admitted to the course; some students spent three hours of commuting time each day to attend the two-hour evening orientation sessions; and many of the group were expected to keep daily assignments up to date or to review for final examinations

during this time. Only a few teachers from the high schools which the students attended cooperated by excusing the students from routine homework.

During the selection period, students were encouraged to "bring a friend" whom they could consult later during the independent practice session for encouragement and competition to assure interest. As a result several pairs of neighbors, cousins, or classmates enrolled.

Even though abilities ranged from I.Q.'s of 71 to 150, and reading grade levels from 3.0 to 16.0, care was taken that no students who were non-readers, serious personality problems, or who demanded constant individual attention were accepted since it was felt that these could not work well independently even if materials and directions were clear.

Procedure.--The program ran for nine weeks altogether and was divided into two sections. The first two weeks were used as an orientation period while the last seven weeks involved independent practice.

The week before the program started ten teacher-clinicians met Monday through Thursday evening for two and one-half hours with Dr. Mabel S. Noall, Director of the Secondary Reading Clinic at Boston University, to

become acquainted with the materials and mechanical devices to be used.

Two large adjoining rooms in the School of Education were made available to the group. Adequate storage of materials was accessible.

At the first meeting of the orientation period, Dr. Noall explained to the students how the course would operate, gave some hints on study and reading progress and introduced some of the clinicians with whom the students would be working. The rest of the two-hour session was devoted to the giving of a battery of pre-tests to analyze student needs.

The following tests were administered. The Iowa Silent Reading Test, Advanced, Form BM; the Michigan Speed of Reading Test, Form I; the Morrison-McCall Spelling Scale, List I; and two informal tests devised by Dr. Noall to test visual memory and phonic spelling. Students were assured that results of these tests would be explained at the second meeting.

Meeting one half hour prior to the student's arrival each evening, the clinicians were able to discuss various cases, go over pre-test results, and assemble materials.

At the second meeting students were given the results of pre-tests with careful interpretation of their scores. To those who had not been previously tested, the CAS sections (Comprehension, Arithmetic, Similarity) of the WISC or WAIS scales of the Wechsler Intelligence Tests were given to reduce the time consumed in the diagnostic process since no item analysis was needed. In a study by Jillson¹ this short form was found to compare favorably with experimentation done on the Wechsler-Bellevue, and showed correlations with the total test all above .85. In most cases, the sub-groups performed comparably with each other and in general "showed no appreciable differences with the total group findings or Wechsler data on the original standardization groups."

Over 300 paper backs were displayed on a "browsing" table, and students were encouraged to select titles which interested them during the last few minutes of this second session.

By the third meeting a schedule (see Appendix, List Three) had been duplicated, work stations with appropriate materials and devices had been set up, and each

¹Richmond P. Jillson, "An Investigation of the Clinical Possibilities of Certain Abbreviated Forms of the Wechsler Intelligence Scale for Children" (Unpublished Master's thesis, Boston University, Boston, 1959).

student in conference with a clinician was advised as to which materials would profit him most. Notebooks were given to each student where records of materials used, progress charts, study hints and practice exercises could be kept.

For the remainder of that session plus the five to follow, students followed the schedule as outlined below.

The first 15 minutes of each evening were devoted to a group meeting with one of the clinicians in charge. The five topics included methods of timing for increasing speed on story-type materials called "The Alarm Clock Technique," how to keep records, description and practice on phrase reading, types of paragraph organization, and hints for studying spelling.

For the next 20 minutes students went to one of the work stations that their advising clinician had originally scheduled for them in their notebooks. Such things as spelling, word analysis, locational skills, following directions and vocabulary were available, each under the direction of a clinician.

During the following 45-minute section students and clinicians rotated to such work stations as organization, both simple and advanced; speeded techniques involving mechanical devices; tachistoscope practice, and work on comprehension.

The fourth period of each evening was also of 20 minutes' duration. During this time students could work on phonics, advanced vocabulary, critical reading or skimming.

To close each session the group met as a whole to practice such skills as "Flow of Ideas," "Multi-Meaning Words," "Patterns from Lists," and "Speed Tests" taken from marked issues of the Reader's Digest.

This plan gave each student an opportunity to work with each of the materials in which he was interested or needed practice, use any of the mechanical equipment, and get acquainted with following various kinds of directions, and keep records. It also gave the clinicians an opportunity to observe each student's difficulty and progress, interests and attitudes before selecting materials for the independent practice sessions.

The last 30 minutes of the final orientation period were devoted to individual counseling. Each student was provided with a complete reading kit containing a minimum of five different materials suited to the student's needs, directions, keys for scoring, and record charts. Specific daily and weekly schedules were set up for a minimum of 30 minutes of daily practice.

Announcement of the post-testing date seven weeks hence was made as well as an explanation of why practice

records and progress charts were necessary to reading growth.

Students were given opportunity to ask any questions they wished, and seemed to take an avid interest in the procedure when they felt they were "part of a real experiment," as one young man phrased it.

During the independent practice session of seven weeks' time, three post cards were sent to each student both to encourage consistent practice and to remind him of the post-testing date.

Students were also assured that they would be notified of their individual progress after the post-testing as well as the gains made by the group as a whole.

Throughout the orientation period students worked diligently, were friendly both to each other and to the clinicians and displayed a definite attitude of determination to achieve. They felt that their progress was important not only to themselves and their families but also to the clinicians.

Methods.--A variety of individual, small-group and large group methods were used during the orientation period. Most of these, however, were characterized by the giving of brief, explicit directions with immediate opportunity for the students to go through the entire process

of completing the exercise, scoring it, and recording the results. In this way the clinicians could be sure that the students would be able to handle the materials efficiently when they were working independently.

The list of activities given in the preceding section gives an insight into the variety of the methods used and the time consumed by each.

During the independent practice period of seven weeks, students were encouraged to spend the same period of time each day in practice. They were told that they would progress more if they worked at the same place, kept the radio and TV off during the practice session, and followed the daily schedule set up for them by their counseling clinician.

Care was taken to give a variety of practice skills in each day's activities and to keep the development of skills in logical order depending on each student's needs.

Materials.--A wealth of materials and devices were available to the group during the orientation period. Drills on vocabulary development included the teaching of vocabulary in context, multi-meaning words, words often confused, and synonym-antonym exercises were available in duplicated form from studies done at Boston University

School of Education. Similar materials were available on skimming, paragraph organization, central ideas and following directions.

Reader's Digests were used both for speed and comprehension and vocabulary development. Maps, charts, and graphs drawn from periodicals and magazines were used in the teaching of locational skills and skimming.

Science Research Associates' two new spelling labs were used with those needing help in spelling while the SRA Reading for Understanding Lab and Altick's Preface to Critical Reading were used to develop critical reading and inferential thinking. Both the SRA Reading Laboratory, Secondary Edition and College Prep Edition were used for speed exercises, comprehension, and word meaning skills.

The McCall-Crabb Standard Test Lessons in Reading were also used in cut-up form with emphasis on skimming as well as on speeded comprehension.

A Controlled Reader and Tach-X, a Rateometer and an SRA Reading Accelerator used with Simpson's SRA Better Reading Books, I-III, as well as a Keystone Overhead Projector for tachistoscopic practice were available.

Some students worked with the Dolch "Phonic Materials" and the Durrell "Word Analysis Cards."

Hovious' Following Printed Trails was used for practice with key words, phrase reading, central idea and paragraph organization.

The more advanced students used Norman Lewis's "The Five Hundred Useful Words College Students Do Not Know," from How To Read Better and Faster, which proved both enjoyable and most challenging.

Most of the materials used were self-scoring so that students could see progress immediately--a necessary thing when time periods during the orientation period were relatively short and students worked on at least four types of materials during each session.

Students also worked under a certain time pressure to "See how many you can do in two minutes," or "How fast you can finish this set?" or "See if you can't cut your time by 30 seconds over yesterday and still keep your high comprehension rate."

Hundreds of paperbacks were on hand for student selection. Each member of the group was encouraged to take one or two home to read returning them by the end of the orientation period.

A new material or technique was introduced each day to stimulate motivation.

Materials given to each student for development of skills during the seven-week independent practice

period included some overlap with exercises used in the orientation period.

Each student was given at least two copies of the Reader's Digests with a minimum of fifteen marked speed exercises complete with comprehension questions and answer keys as well as a progress chart to record achievement.-

About half of the number showed the need for vocabulary, specific fact recognition and outlining practice as given in the Reading for Meaning exercises. So appropriate levels of these workbooks were cut up and mounted on colored oak tag with keys included so that each student had twelve lessons.

Those having trouble with following directions were given appropriate exercises duplicated from materials at the Boston University Secondary Reading Clinic.

Vocabulary was developed through use of numerous duplicated practice sets, including multi-meaning words, words often confused, synonym-antonym drills, Reader's Digest "Vocabulary from Context," Hardwick's Words Are Important series at several levels, Lewis's Word Power Made Easy, and Weber's Reading and Vocabulary Development.

Study skills practice for those who needed it was given through the use of Rachel Salisbury's Better Work Habits, and Scott, Foresman's Basic Reading Skills for High School Use.

Numerous lessons from different levels of the McCall-Crabb Standard Test Lessons in Reading were mounted on colored oak tag and used for the development of skimming, types of paragraph organization, writing topic sentences, making indexes and tables of contents, and timed speed and comprehension drills. The Gates-Pearson Practice Exercises in Reading on several levels were also used to get the main idea, predict outcomes, follow directions and understand details.

A workbook called Increasing Reading Efficiency by Lyle L. Miller was used to increase speed of perception, word and phrase meaning, and sentence structure and meaning. Vocabulary exercises were centered around some drills, and timed practice with four kinds of reading (idea reading, exploratory reading, critical reading, and study-type material) were also used. Stroud and Ammons's Improving Reading Ability was used for similar practice exercises with perhaps more stress on visual analysis and speeded comprehension of paragraphs and directions. Similar exercises were also taken from Smith's Be A Better Reader series, and Witty's How To Become a Better Reader.

Exercises based on elementary level spelling workbooks, especially those of Spelling for Word Mastery by Patton, were designed and mounted for those with definite spelling problems.

For the more advanced students, organizational practice was provided by Strang's Study Type Reading Exercises.

Each student chose two paperbacks on his reading level which especially interested him. These were used for speeded free reading. Lists of other paperbacks on appropriate levels with publishers and prices were included so that students could keep reading after the practice period if they wished.

Complete listings of published materials used in both the orientation period and the independent practice period are included in the appendix.

2. Description of Group I and Group II

Procedure.--To answer the question of whether self-directed individualized techniques would compare as far as growth in reading achievement was concerned with present practices of uniform classroom instruction, two comparable classes of approximately 25 students each were studied as part of the 1960 summer teacher-training program at Boston University.

The groups were housed in two very large adjoining rooms with suitable storage for materials located directly across the hall.

A highly competent teacher, Miss Hubefta Randolph, Coordinator of the Language Arts Program for the Secondary Schools of Salt Lake City, Utah, taught Group I.

Students for the two groups, representing 32 schools in the Boston area, felt a personal need for improving their reading skills. Noall¹ states, "Students with severe word recognition difficulties and in need of individualized attention were sent to the reading clinic, but a number of those who attended the classes needed help with phonics and word structure, too." Nearly every one of the students felt that he needed help with vocabulary improvement.

Students represented grades seven to college freshman level, inclusive. A battery of tests was given to each student which included the following: the Iowa Silent Reading Test, Advances; the Michigan Speed of Reading Test; the Morrison-McCall Spelling Scale; with the complete WAIS or WISC Wechsler Scale or the short form of the Comprehension, Arithmetic, and Similarities sections, an informal test on visual memory, and the Durrell Phonetic Spelling test.

"Students met in two-hour sessions, four days a week, Tuesday through Fridays, for six weeks. Three of

¹Noall, op. cit., p. 28.

the eighteen sessions were used for the pre-orientation, the post testing, and the party that culminated the program,"¹ totaling approximately 30 hours of training.

A great variety of materials including workbooks, supplies and mechanical equipment as well as a large assortment of paperbacks ~~was~~ available to the two groups.

After the pre-test data had been analyzed the students were equated into two groups so that they were statically comparable on I.Q., age in months, grade placement, sex ratio, and reading ability as illustrated in the Iowa Silent Reading Test scores, the Michigan Speed of Reading scores, the Morrison-McCall Spelling achievement, visual memory, and the Durrell Phonetic Spelling Test.

Findings.--Post-tests given after the two groups had worked 30 hours each showed that both methods had produced highly significant gains on both the Iowa Silent Reading Tests and the Michigan Speed of Reading Tests, but no gains were noticed on the Morrison-McCall Spelling Scale. It was also noted that the gains made were not significantly different for the two groups.

¹Ibid.

Noall¹ states,¹

The average improvement on the two tests was approximately 2.8 grade levels, with the advantage slightly in favor of the uniform class instruction on the Iowa Silent Reading Test and slightly in favor of the individualized self-direction on the Michigan Speed of Reading Test. Observation of the classes indicated that such factors as group rapport, cooperation and numbers of books read seemed to be higher in the class with uniform class instruction. On the other hand, the students who worked on their own appeared to develop in ability to direct their own work and in general maturity. The younger students of the group seemed to take more readily to the self-direction than did the older students.

3. Comparative Data on Groups I, II and III

If the condition of independent practice on the improvement of reading skills were to prove valid, some type of controlled comparison was needed to illustrate the rate of growth versus gains made by other methods. For this reason the present experimental group which shall be referred to as Group III, Independent Practice, was equated with Group I, Uniform Class instruction, and Group II, Individualized instruction.

Table 1 contains the comparative data on the characteristics and pre-tests of the three groups.

¹Ibid., p. 30.

TABLE I. DATA ON THE COMPARISON BETWEEN THREE GROUPS: UNIFORM (GROUP I) vs. INDIVIDUALIZED (GROUP II) vs. INDEPENDENT (GROUP III) PRACTICE

Variable	Group	Number	Mean	S. D.	Sigma of the Mean	C. R.	Level of Significance
Wechsler (WISC or WAIS) I.Q.	Group I	22	114.71	7.14	1.024	.753 (Group I - II)	Not Sig.
	Group II	21	113.14	7.98	1.816	.520 (Group I - III)	Not Sig.
	Group III	22	114.04	17.55	.766	1.968 (Group II - III)	Not Sig.
Age in Months	Group I	22	184.7	11.23	.421	.811 (Group I - II)	Not Sig.
	Group II	21	179.3	11.01	.516	11.934 (Group I - III)	Sig.
	Group III	22	193.4	19.10	.595	17.927 (Group II - III)	Sig.
Iowa Silent Reading Test, Advanced	Group I	19	162.5	6.534	1.886	-1.095 (Group I - II)	Not Sig.
	Group II	18	165.8	8.589	2.295	1.660 (Group I - III)	Not Sig.
	Group III	22	165.8	18.335	.800	.041 (Group II - III)	Not Sig.
Michigan Speed of Reading Test	Group I	22	37.2	7.524	1.881	.788 (Group I - II)	Not Sig.
	Group II	21	34.7	10.608	2.573	2.087 (Group I - III)	Not Sig.
	Group III	22	38.9	12.447	.905	2.727 (Group II - III)	Sig.
Morrison-McCall Spelling Scale	Group I	22	41.03	5.296	1.224	-.585 (Group I - II)	Not Sig.
	Group II	21	42.28	6.900	1.674	1.562 (Group I - III)	Not Sig.
	Group III	22	39.05	8.688	.610	1.712 (Group II - III)	Not Sig.

TABLE I. --Continued

Variable	Group	Chi-Square	Level of Significance
Grade Placement:			
	On three groups by seven grades	7.457 P < .02	Not Sig.
Sex Ratio			
	Boys		
	Girls		
	Per Cent		
	Number		
	Group I	59.1	60.9
	Group II	57.1	42.9
	Group III	63.6	36.4
Visual Memory Test			
	On three groups of those needing help and those not needing help	2.106 P < .36	Not Sig.
Phonetic Spelling Test			
	On three groups of those needing help and those not needing help	2.866 P < .24	Not Sig.

Equating the groups on nine variables: I.Q., age in months, pre-test reading ability as shown by the Iowa Silent Reading Test, the Michigan Speed of Reading Test, the Morrison-McCall Spelling Scale, grade placement, sex ratio, a visual memory test and a phonetic spelling test, it was found that the groups were statistically similar on all but age at the start of the experiment.

On the Wechsler (WISC or WAIS) I.Q. scale, it was found that Group I had a mean score of 114.71, Group II had a mean score of 113.14, and Group III, a mean score of 114.04. The critical ratio between Group I and Group III was .520 and between Group II and Group III was 1.968 which shows that the groups were not significantly different.

In age in months, Group I had a mean of 184.7, Group II, a mean of 179.3; and Group III, a mean of 193.4. The critical ratio between Group I and Group III was 11.934, while the critical ratio between Group II and Group III was 17.927. On this variable only was there found to be significant difference between the groups.

The findings from the gains made by Groups I and II showed that the younger students¹ "seemed to take more readily to self-direction than did the older students"¹ so

¹Ibid.

this factor did not seem important enough to rate the experiment as not valid.

The mean score on the Iowa Silent Reading Test for Group I was 162.5. Group II showed a mean score of 165.8, while Group III's mean score was almost the same or 165.8. The critical ratio between Group I and Group III was 1.660. A comparison between Group II and Group III showed a critical ratio of only .041 proving that the groups were not significantly different.

On the Michigan Speed of Reading Test, Group I had a mean score of 37.2. Group II's mean score was 34.7. Group III showed a lower mean score of 31.9. The critical ratio between Group I and Group III was 2.087; and between Group II and Group III was 2.727 neither of which show statistically significant difference for a group of this number, at the one per cent level.

Group I had a mean of 41.03 on the Morrison-McCall Spelling Scale. Group II's mean was 42.28, and the lowest mean, that of Group III, was 39.05. The critical ratio between Group I and Group III was 1.362. The critical ratio between Group II and Group III was 1.712, showing that the groups were similar and that statistically the amount of difference in the spelling level would not be significant.

As to grade placement: Chi-Square on the three groups was 7.457; $P < .82$. This means that 82 times out of 100 this difference in ratio of grade placement could occur by chance. Statistically the amount of difference in the grade placement would not be significant.

As to sex ratio, Group I had 13 boys and 9 girls, Group II contained 12 boys and 9 girls, and Group III had 14 boys and 8 girls. Chi-Square was .200; $P < .91$. This means that 91 times out of 100 this difference in sex ratio could occur by chance. No significant difference in the three groups is shown on sex ratio.

No critical ratio is shown for the tests on visual memory and phonetic spelling because the same tests were not given to Group III that had been given to Groups I and II and the norms on the two tests are different. The reason for this was because Group III was older and the tests given to Groups I and II would not have been suitable.

Findings on these two tests were treated by Chi-Square. A grade level of 6.0 was determined on all three groups as the cutting line between those who needed help in visual memory and phonetic spelling and those who did not need help.

On the visual memory test Chi-Square was 2.106; $P < .36$ showing that 36 times out of 100 this difference

could occur by chance. The phonetic spelling test showed a Chi-Square of 2.866, $P < .24$, or 24 times out of 100 this difference could occur by chance. Statistically the amount of difference in the visual memory and phonetic spelling levels of the three groups would not be significant.

To summarize Table 1, which shows the comparison of the three groups before the experiment on variables affecting reading improvement and on pre-test results, it will be noted that the three groups were closely matched. Statistically there was no significant difference among the three groups on the variables of intelligence; achievement as measured on the Iowa Silent Reading Test, the Michigan Speed of Reading Test, the Morrison-McCall Spelling Scale; grade placement; sex ratio; or those needing help on visual memory or phonetic spelling.

There was significant difference between the three groups on the variable of age. Group III averaged nearly a year older than the other two groups.

Since at the start of the experiment the three groups were statistically similar on eight of the nine variables and the same amount of time was to be spent on practice with the same or similar materials in working with Group III as had been used with Group I and Group II,

if there proved to be significant differences in the critical ratios at the end of the experiment, it could be safely stated that factors other than chance would account for these differences.

4. Summary

The purpose of this study was to determine if a group of high school students can improve their reading skills by a period of orientation and self-guided, independent practice.

The study is justified because there is a critical need for the improvement of reading skills of American high school students; there are widespread individual differences; the high school population is increasing rapidly; there are too few high school classrooms or teachers; only a few teachers feel qualified to teach reading; and present reading programs are often non-existent or inadequate.

Research shows that many students feel their need of specific training in reading and that many factors affect whether or not this training will be successful. Some of these factors include the following: sex, I.Q., background, motivation, physical and social factors; study habits, amount and time of practice, types of materials,

and methods of instruction.

Various types of reading programs have been tried. Some of these include uniform classroom instruction, individualized practice, and independent practice. Little research has been reported on the method of independent practice, and the writer could find no studies which attempted to compare the results of all three methods.

This study provided a two-week orientation period and seven weeks of independent practice using a variety of materials to develop specific reading skills as determined by individual student's pre-test results.

The experimental group was compared statistically on nine variables with two other groups taught under different methods and found to be similar on eight of the nine variables.

The study was set up so that a similar amount of practice time would be possible as that spent by the other two groups with which the experimental group was compared. Similar practice materials were used by all three groups.

CHAPTER III

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

1. Restatement of the Problem

The Problem.--This study proposed to determine three things. First, can high school students improve specific reading skills under an independent practice program? Second, what is the amount of improvement that students can make under independent practice in relationship to two other teaching methods; namely, uniform classroom instruction and supervised individual practice? Third, what are the differences between students who showed improvement and those who showed no improvement on four variables: intelligence, age, sex ratio, and amount of practice?

Description of Procedure Used.--A group of twenty-two students was selected, representing fifteen high schools in the Greater Boston area. This group was equated with the two comparative groups on factors of age, intelligence, sex ratio, grade placement, and reading and spelling skills and difficulties. After pre-testing and a two-week orientation period to acquaint students with materials and

methods, each student was given an individualized program of practice to be followed for seven weeks. Alternate forms of the pre-tests were given at the close of the experiment, and a comparison of data was run to point out significant differences among both the performance of individual students and the performance of three groups, performing under different methods, as shown by gains made during the experiment.

2. Report of Participation

Number Participating.--Of the twenty-two students who began the experiment on independent practice for the improvement of reading skills, two did not return for the post-testing. This number represented 9.09 per cent of the total group. Both students were males.

The mean IQ of the dropouts was 111.00 or 3.04 points lower than the group mean IQ of 114.04.

The mean age in months of those not completing the experiment was 212.0 in comparison with the group mean in age in months of 193.4. This is 18.6 points above the group age mean.

The dropouts represented students in two grades--one in grade eleven and one in grade twelve.

In reply to cards sent to all the students involved in the experiment, it was found that one of those not

returning for post-testing did not do so because of a summer vacation trip with his family to a distant point while the other had been ill during most of the nine-week period and was not able to practice or to return for the post test.

Average Amount of Practice.--In response to questions regarding the amount of practice time spent by participants of the experiment it was found that 87.50 per cent of the girls and 33.32 per cent of the boys had practiced more than the twenty hours asked of them, and an additional 41.65 per cent of the boys had practiced between eighteen and twenty hours. Twelve and one-half per cent of the girls and 25.03 per cent of the boys had practiced between fourteen and fifteen hours while none of the participants reported that he had practiced less than fourteen hours independently.

Reasons for the amount of practice varied, but the most prevalent were that summer jobs, summer camp, or family vacations interfered with practice.

In considering the two variables of sex ratio and grade placement no significant relationships were noted. There was a wide variety in these factors in those practicing more than twenty hours as well as those practicing only fourteen hours.

Two of the participants were post-tested after only fourteen hours of independent practice because they were

leaving the area for long periods of camping. These two students represented two of the three youngest and most gifted in intelligence of the entire group. Their motivation during the practice time, even though it was over a shorter duration, no doubt accounted for their mean gains of 17 points on the Iowa Silent Reading Test, 2.0 grade levels on the Michigan Speed of Reading Test, and 1.2 grade levels on the Morrison-McCall Spelling Scale.

Three other members of the group, again representing the next three youngest of the group and the next three highest in intelligence, were post-tested five days prior to the rest of the group because of summer camping plans. They, however, had put in their required practice time so their scores have not been reported separately.

Differences between Achievers and Non-Achievers.--

A comparison of students who showed improvement during the nine-week experiment and those who showed no improvement reveals the following. On the Iowa Silent Reading Test, Advanced, three students showed no improvement. These three, representing 13.63 per cent of the group who completed the experiment, had a mean IQ of 85.00 in comparison with the mean IQ of 114.04 for the total group. On the factor of age, the three students showed a mean of 193.6 age in months while the mean age of the total group was

193.4. All three students were females. On the variable of amount of practice there was no difference between the Achievers and the Non-Achievers. Each of the three Non-Achievers reported a total practice time of twenty hours which is the same as the average amount of practice reported by the total group.

Differences noted on the Michigan Speed of Reading Test between Achievers and Non-Achievers showed the following. Only two students showed no improvement. They accounted for 9.09 per cent of the total group. On the factor of IQ these students showed a mean IQ of 130.00 in comparison with the total group mean IQ of 114.04. On the factor of age, the Non-Achievers showed a mean of 187.0 age in months in comparison to the total group mean of 193.4 age in months. Both of the Non-Achievers were males, and both reported twenty hours of independent practice which is similar to the average amount of practice reported by the total group.

The Morrison-McCall Spelling Scale showed the following differences between Achievers and Non-Achievers. Four students, representing 18.18 per cent of the total group, showed no gains on the spelling post test. Their mean IQ was 118.75 in comparison to the total group mean IQ of 114.04. Their mean in age in months was 189.3 in

comparison to the total group mean age of 193.4. All four students were males. All four reported an average amount of twenty practice hours equal to the average amount of practice time reported by the total group.

These findings seem to indicate that the girls who were lower in IQ did not improve on the Iowa Silent Reading Test, and boys who were slightly higher in IQ and younger in age than the average of the group did not improve in spelling. These findings, however, are not significantly characteristic to reflect generalizations about the group.

3. Post-Test Results

Comparison of Pre and Post Test Results on the Iowa Silent Reading Test, Advanced.--Table 2 shows the comparison of pre and post test results on the sub tests of the Iowa Silent Reading Test, Advanced.

TABLE II. DATA ON THE COMPARISON OF IOWA SILENT READING TEST SUB-SCORES BEFORE AND AFTER THE EXPERIMENT FOR INDEPENDENT (GROUP III) PRACTICE

Test	Test Time	Number	Mean	S. D.	Signa of the Mean	C. R.	Level of Significance
Rate	Before	22	166.775	25.200	1.121	19.113	Highly Significant
	After	20	195.750	22.245	1.021		
Comprehension	Before	22	171.550	20.165	.871	2.276	Significant
	After	20	174.750	24.055	1.104		
Directed Reading	Before	22	164.820	18.790	.774	9.991	Highly Significant
	After	20	175.500	16.055	.737		
Poetry	Before	22	157.225	23.330	1.018	11.811	Highly Significant
	After	20	170.300	17.100	.436		
Word Meaning	Before	22	169.275	20.930	.913	7.698	Highly Significant
	After	20	177.820	24.813	.632		
Sentence Meaning	Before	22	170.865	19.125	.834	3.749	Highly Significant
	After	20	166.250	19.955	.911		
Paragraphs	Before	22	158.365	25.300	1.104	9.066	Highly Significant
	After	20	172.000	22.245	1.021		
Index	Before	22	165.410	23.300	1.010	5.655	Highly Significant
	After	20	171.150	21.742	.103		
Key Words	Before	22	159.045	18.040	.787	14.495	Highly Significant
	After	20	174.250	15.120	.694		

The mean score on "Rate" for the total group before the experiment was 166.775. At the end of the period of independent practice the mean score was 195.750 representing a gain of 28.975 points. The critical ratio was 19.113 which shows this difference is highly significant at the one per cent level.

On the "Comprehension" sub-test the before-practice mean for the group was 171.550. Post-test results set the mean on this sub-test at 174.750 representing a difference of 3.200 points. The critical ratio of these two scores was 2.276 showing that the difference is significant at the five per cent level for a group of this number.

The third sub-score, "Directed Reading," showed a mean of 164.820 at the start of the experiment. The end of the experiment brought a mean score of 175.500 representing a gain of 10.680 points. A critical ratio of these two scores was 9.991 which is highly significant at the one per cent level.

The "Poetry" sub-test had a pre-test mean of 157.225. Post-test results showed a mean of 170.300. The critical ratio was 11.811 with a mean gain of 13.075 points which is highly significant at the one per cent level.

The "Word Meaning" section pre-test results had a mean of 169.275. The post-test mean was 177.820 with a critical ratio between these scores of 7.698. This means that the difference was highly significant at the one per cent level.

The "Sentence Meaning" section had a mean score of 170.865 on the pre-test. The post test mean was 166.250. The critical ratio of these scores was 3.749 showing that the difference again was highly significant at the one per cent level.

The "Paragraph" section sub-test, which had next to the lowest pre-test mean score of 158.365, on post-test results showed a mean of 172.000 and a critical ratio of 9.066 which is highly significant at the one per cent level.

The "Index" sub-test had a mean of 165.410 on the pre-test. On the post-test the mean was 171.150. A critical ratio of these two scores showed a result of 5.655 which is highly significant at the one per cent level.

The last sub-test, "Key Words," had a pre-test score of 159.045. At the end of the experiment post-testing results of this section showed a mean of 174.250. The critical ratio of these two scores was 14.495 which

again is highly significant at the one per cent level of confidence.

Table 2 shows that in all nine of the sub-tests on the Iowa Silent Reading Tests there was significant improvement beyond the factor of chance.

For anyone interested, the pre-test and post-test results not only for the Iowa Silent Reading Test but also for the Michigan Speed of Reading Test and the Morrison McCall Spelling Scale are reported in percentiles for each student in the experiment. The intelligence, grade completed, grade expected in reading achievement, and whether or not they needed help with visual memory or phonetic spelling are also listed on the first chart. This information is included as List One in the Appendix. In this way individual student achievement before and after the experiment can be compared.

Comparison of Workers and Non-Workers.--Table 3 shows a comparison of data on the experimental group (Group III) divided into two groups--Workers versus Non-Workers on the post-test results. The groups were divided on the basis of amount of time spent in independent practice with the Workers having spent eighteen hours or more in practice time and the Non-Workers having spent between fourteen and seventeen hours in independent

TABLE III. DATA ON THE COMPARISON OF WORKERS vs. NON-WORKERS OF INDEPENDENT PRACTICE (GROUP III) ON POST-TEST RESULTS

Variable	Group	Number	Mean	S. D.	Signa of the Mean	C. R.	Level of Significance
Wechsler (WISC or WAIS) I.Q.	Workers	14	110.93	20.195	1.120	6.914	Highly Significant
	Non-Workers	6	123.50	6.876	1.025		
Age in Months	Workers	14	186.285	19.895	1.103	8.532	Highly Significant
	Non-Workers	6	201.165	15.115	1.352		
Iowa Silent Reading Test, Advanced	Workers	14	172.355	18.170	1.008	6.120	Highly Significant
	Non-Workers	6	182.000	13.540	1.211		
Michigan Speed of Reading Test	Workers	14	40.930	13.520	.749	2.148	Significant
	Non-Workers	6	44.998	11.706	1.745		
Morrison-McCall Spelling Scale	Workers	14	40.071	7.632	.706	1.278	Not Significant
	Non-Workers	6	39.166	6.768	1.066		
Grade Placement					Chi-Square		
On two groups by seven grades					5.713 P < .46		Not Significant
Sex	Boys		Girls				
		Number	Per Cent	Number	Per Cent		
	Workers	7	50.00	7	50.00	3.225 P < .20	Not Significant
	Non-Workers	5	83.33	1	16.67		

practice.

Table 3 shows that the mean of the Workers was 110.93 on intelligence. The mean of the Non-Workers was 123.50. A critical ratio between these two scores was 6.914 which was highly significant.

On age in months the Workers had a mean of 186.285. The Non-Workers had a mean of 201.165. The critical ratio was 8.532. This means that the difference between these two numbers was highly significant at the one per cent level.

On the Iowa Silent Reading Test, Advanced, the Workers had a mean of 172.355 while the Non-Workers' mean was 182.000. The critical ratio was 6.120 which was highly significant.

On the Michigan Speed of Reading Test the Workers had a mean score of 40.930. Non-Workers on this test had a mean score of 44.998. The critical ratio was 2.148 showing that the difference was significant at the five per cent level.

The Morrison-McCall Spelling Scale showed a mean score of 40.071 for the Workers. Non-Workers had a mean score of 39.166. The critical ratio was 1.278 showing that the difference was not statistically significant and could be attributed to chance.

On grade placement by seven grades on the two groups the Chi-Square was 5.713. This means that $P < .46$ or that 46 out of 100 times this could occur by chance. This is not considered statistically significant for a group of this number.

On sex ratio on the two groups the Chi-Square was 3.225. This means that $P < .20$ or that twenty times out of 100 this could occur by chance. This is not considered statistically significant for a group of this number.

Table 3 shows that four variables: IQ, age Iowa Silent Reading Test results, and Michigan Speed of Reading Test results, discriminated between the group who worked and the group who did not work as much. On the variables of the Morrison-McCall Spelling Scale, grade placement and sex ratio, the differences between these two groups was not statistically significant. Whether this division between students in the experimental group divided into Workers and Non-Workers is actually significant when it is based, as it had to be according to the reported data, on a maximum difference of only four hours of practice is questionable in the mind of the writer.

Comparison of Test Results on All Three Groups on All Tests.--Table 4 shows a comparison of before and after test scores on Uniform (Group I) versus Individualized

TABLE IV. DATA ON THE COMPARISON OF BEFORE AND AFTER TEST SCORES ON UNIFORM (GROUP I) vs. INDIVIDUALIZED (GROUP II) vs. INDEPENDENT (GROUP III) PRACTICE

Test	Group	Test Time	Number	Mean	S. D.	Signa of the Mean	C. R.	Level Significance
Iowa Silent Reading Test, Advanced; BM CM Forms								
	Group I (Uniform Class Instruction)							
		Before	19	162.5	6.534	1.886	3.419	Highly Significant
		After	19	172.9	8.268	2.387		
	Group II (Individualized, Self-Direction)							
		Before	18	165.8	8.589	2.295	4.013	Highly Significant
		After	18	174.2	12.318	3.292		
	Group III (Independent Practice)							
		Before	22	165.8	18.335	.800	9.084	Highly Significant
		After	20	176.8	17.570	.806		
Michigan Speed of Reading Test, Form I and II								
	Group I (Uniform Class Instruction)							
		Before	22	37.2	7.524	1.881	2.862	Highly Significant
		After	22	44.8	7.494	1.874		
	Group II (Individualized, Self-Direction)							
		Before	21	34.7	10.608	2.573	2.867	Highly Significant
		After	21	46.2	12.705	3.091		
	Group III (Independent Practice)							
		Before	22	31.9	12.447	.905	7.774	Highly Significant
		After	20	42.2	12.692	.978		
Morrison-McCall Spelling Scale, Lists I and II								
	Group I (Uniform Class Instruction)							
		Before	22	41.0	5.296	1.324	-.625	Not Significant
		After	22	41.7	4.942	1.235		
	Group II (Individualized, Self-Direction)							
		Before	21	42.3	6.900	1.674	.413	Not Significant
		After	21	41.3	7.206	1.748		
	Group III (Independent Practice)							
		Before	22	39.0	8.688	.610	4.920	Highly Significant
		After	20	43.0	7.035	.538		

(Group II) versus Independent (Group III) practice.

Table 4 shows that the Group I (Uniform Class Instruction) made gains on the Iowa Silent Reading Tests of a mean of 162.5 on the pre-test to a mean of 172.9 on the post-test. The critical ratio of these two scores was 3.419 which is highly significant at the one per cent level and that only in one out of 100 times could this gain be attributed to chance factors.

Group II (Individualized, Self-Direction), had a pre-test mean of 165.8. The mean of the post-test was 174.2. The critical ratio was 4.013 which again is highly significant statistically. This gain could not statistically be attributed to chance.

Group III (Independent Practice) showed a pre-test mean score of 165.8. The mean on the post-test was 176.8. The critical ratio between these scores was 9.084. This means that statistically the differences between the two scores were highly significant and that these differences could not be attributed to chance.

On the Michigan Speed of Reading Test Group I (Uniform Class Instruction) had a pre-test mean score of 37.2. Post-test results showed the mean for this group to be 44.8. The critical ratio for these scores was 2.862 which is highly significant beyond the factor of chance.

Group II (Individualized, Self-Direction) had a mean score of 34.7 before the experiment. Afterwards, the mean score was 46.2. The critical ration of 2.867 showed this to be a highly significant gain not attributable to the factor of chance.

Group III (Independent Practice) had a pre-test mean score of 31.9. The post-test results showed a mean score of 42.2. The critical ratio between these two scores was 7.774. This means that the difference was statistically highly significant. In only one case out of 100 could this difference occur by chance.

The Morrison-McCall Spelling Scale showed Group I (Uniform Class Instruction) with a pre-test mean of 41.0 and a post-test mean of 41.7. The critical ratio between these two scores was -.625 which is not significant statistically. Differences in these two scores could occur by chance.

Group II (Individualized, Self-Direction) had a pre-test mean score of 42.3 and a post-test mean score of 41.3. The critical ratio was .413 which means that the differences were not statistically significant and could occur by chance.

Group III (Independent Practice) had a pre-test mean score of 39.0. Post-test results showed a mean of

43.0. The critical ratio was 4.920. The difference is highly significant statistically and could not occur by chance.

A summary of Table 4 shows that statistically both Group I and Group II made significant gains on the Iowa Silent Reading Test with Group II being slightly favored. Group III showed comparable gains which means that this group made highly significant gains during the experiment.

On the Michigan Speed of Reading Test both Group I and Group II made about similar significant gains while Group III also made highly significant gains.

On the Morrison-McCall Spelling Scale, neither Group I nor Group II made statistically significant gains. On this test Group III did show highly significant statistical gains showing more progress than either Group I or Group II.

Table 5 continues giving a comparison of the three groups on all three tests results to show difference in gains.

Table 5 shows that the critical ratios on the Iowa Silent Reading Test between Group I and Group II before and after the experiment were -1.095 and .320 neither of which are statistically significant. This amount of difference could occur by chance.

TABLE V. DATA ON THE COMPARISON OF BEFORE AND AFTER ACHIEVEMENT OF UNIFORM (GROUP I) vs. INDIVIDUALIZED (GROUP II) vs. INDEPENDENT (GROUP III) PRACTICE TO SHOW DIFFERENCES IN GAINS

Test	Time	Group I with Group II		Group I with Group III		Group II with Group III	
		C. R.	Level of Significance	C. R.	Level of Significance	C. R.	Level of Significance
Iowa Silent Reading Tests, Advanced:							
	Before Experiment	-1.095	Not Sig.	1.660	Not Sig.	.041	Not Sig.
	After Experiment	.320	Not Sig.	1.552	Not Sig.	.778	Not Sig.
Michigan Speed of Reading Test							
	Before Experiment	.788	Not Sig.	2.087	Not Sig.	2.727	Significant
	After Experiment	.389	Not Sig.	2.090	Significant	1.472	Not Sig.
Morrison-McCall Spelling Scale							
	Before Experiment	-.585	Not Sig.	1.362	Not Sig.	1.712	Not Sig.
	After Experiment	.214	Not Sig.	1.247	Not Sig.	1.756	Not Sig.

The critical ratios on this test between Group I and Group III were 1.660 and 1.552 respectively. This means that the difference in amount of gain was not statistically significant at the five per cent level and that this amount of difference could occur by chance. The critical ratios on this test between Group II and Group III before and after the experiment were .041 and .778 respectively. This shows that the differences between these two groups were not statistically significant at the five per cent level.

On the Iowa Silent Reading Test, therefore, all three groups were similar before practice, and all three groups made comparable and highly significant gains. The differences in gains among the three groups taught by different methods were not significantly different.

On the Michigan Speed of Reading Test the critical ratios between Group I and Group II before and after the experiment were .788 and .389 respectively. This indicates that the two groups were not significantly different from each other before or after the experiment. The critical ratios between Group I and Group III before and after the experiment were 2.087 and 2.090 respectively. This difference is statistically significant at the five per cent level with the difference favoring Group III. The critical ratio between Group II and Group III at the start of the

experiment was 2.727, which is statistically significant at the five per cent level, favoring Group II. At the end of the experiment the critical ratio was 1.472. Since the early advantage of Group II was erased by the larger gains made by Group III, this means that a comparison of the gains made by Groups II and III was statistically significant in favor of Group III. This amount of difference could not be attributed to chance factors.

On the Michigan Speed of Reading Test, while all three groups showed highly significant gains at the end of the experiment, Group III made slightly higher gains than did Group I. These findings indicate that independent practice seems to be superior to uniform group practice.

On the Morrison-McCall Spelling Scale the critical ratio between Group I and Group II before the experiment was -.585 which is not statistically significant at the five per cent level. At the end of the experiment the critical ratio between these two groups was .214 which is not statistically significant and could occur by chance. A comparison between Group I and Group III before the experiment showed a critical ratio of 1.362 which is not statistically significant. The critical ratio of these two groups after the experiment was 1.247 which is not statistically significant. This means that this amount of difference could occur by chance. In comparing Group II

with Group III before the experiment a critical ratio of 1.712 was found which means that the two groups were not statistically different at the five per cent level. This amount of difference could occur by chance. A comparison at the end of the experiment showed a critical ratio of 1.756. This means that the difference was not statistically different at the five per cent level.

While the gains of Group III were significant, the relationships of the three groups both before and after the experiment were close enough to show chance factors in operation regarding their relative strengths.

In summarizing Table 5 it can be concluded that Group I and Group II did not differ statistically at the beginning of the experiment on any of the three tests. At the end of the experiment, both groups showed comparable and highly significant gains on both the Iowa Silent Reading Test and the Michigan Speed of Reading Test but not on the Morrison-McCall Spelling Scale. These two groups did not show statistically significant differences in gains on any of the three tests.

Group I and Group III did not differ statistically on any of the three tests at the start of the experiment. At the end of the experiment Table 5 shows that Groups I and III, both making significant gains, did show a statistically significant amount of difference at the five

per cent level on the Michigan Speed of Reading Test favoring Group III, but no significant amount of difference on the Iowa Silent Reading Test. While the gains of Group III were significant on the Morrison-McCall Spelling Scale, the amount of difference on the test between these two groups both before and after the experiment was close enough to show chance factors in operation.

A comparison of Group II and Group III before the experiment showed a significant statistical difference at the five per cent level on the Michigan Speed of Reading Test, but not on the other two tests. After the experiment data showed again that both groups had achieved significant gains. The data showed that while Group III seemed to show slight superiority on the Morrison McCall Spelling Scale, the amount of difference between the two groups both before and after the experiment was close enough to show chance factors in operation.

Comparison of Grade Level Achievements of All Three Groups.--Table 6 shows a comparison of before and after grade scores on the three groups.

Table 6 shows that on the Iowa Silent Reading Test Group I made 2.7 grade levels of gain, Group II, 2.4 grade levels of gain, and Group III, 2.17 grade levels of gain. On this test Groups I and III made the most significant

TABLE VI. COMPARISON OF BEFORE AND AFTER GRADE SCORES ON UNIFORM (GROUP I) vs. INDIVIDUALIZED (GROUP II) vs. INDEPENDENT (GROUP III) PRACTICE

Test	Group	Achievement in Grade Levels		
		Before	After	Gains
Iowa Silent Reading Test, Advanced				
	Group I (Uniform Class)	10.0	12.7	2.7
	Group II (Individualized)	10.9	13.3	2.4
	Group III (Independent)	10.9	13.6	2.7
Michigan Speed of Reading Test				
	Group I (Uniform Class)	9.2	11.9	2.7
	Group II (Individualized)	8.8	12.0	3.2
	Group III (Independent)	8.0	10.8	2.8
Morrison-McCall Spelling Scale				
	Group I (Uniform Class)	8.0	8.4	.4
	Group II (Individualized)	8.4	8.0	-.4
	Group III (Independent)	7.5	8.8	1.3

progress although all three groups made important gains based on standardized test norms.

Data on the Michigan Speed of Reading Test showed Group I with a grade level gain of 2.7 while Group II made a gain of 3.2 grade levels based on test norms. Group III made a gain of 2.8 grade levels. On this test Group II or the group taught by the individualized method made the most significant gain.

On the Morrison-McCall Spelling Scale, Group I made a gain of only .4 grade levels while Group II showed a loss of .4 grade levels on the test norms. Group III showed a gain of 1.3 grade levels after the experiment. On this test Group III or the group taught by the independent method showed the most gain.

4. Findings and Conclusions

Results Indicated.--The experiment seems to show that if highly motivated, high school students with reading deficiencies will practice independently.

On the three standardized tests, improvements on specific reading skills were comparable by the independent practice method, by the uniform class instruction, and by the individualized, self-directed method.

The writer concludes that this method can be used successfully with groups similar to that of the

experimental group to increase reading and spelling achievement.

When considering such factors as intelligence, age, grade placement, and sex ratio, the experiment has shown that those in the experimental group who did not complete the independent practice were slightly lower than the mean of the total group in intelligence and far above the mean (or older than the average) in age. Both of the dropouts were males in grades eleven or twelve. However, this is a small dropout percentage. In view of the valid reasons which necessitated both students to withdraw from the experiment, no generalizations regarding these factors can be made.

In considering the differences shown in amount of practice reported, no significance in the variables of grade placement and sex ratio was noted. All students taking the post-test reported between fourteen and twenty-two hours of independent practice. It will be noted, however, that the students who made the most gains were those who reported independent practice time of between fourteen and seventeen hours and who showed higher than the group mean in both IQ and age in months.

This study has shown that students will practice independently if (1) they have the proper materials, (2) they know how to use the materials to develop the

skills, and (3) they really want to improve.

The independent practice method has, in the findings of this study, proved itself an effective method in comparison to the other two teaching methods when comparing gains made by the three groups.

The independent practice method can prove helpful in the planning and scheduling of groups for reading instruction since it will enable one reading teacher acting as coordinator to help many more times the number of remedial reading cases through directing the setting up of practice programs, but it will leave her free of actual classroom teaching and correcting of students' exercises. This time gained can more effectively be used for remedial problems requiring individual instruction.

The results of this experiment seem to indicate that a reading program based on independent practice can be effective in the improvement of specific reading skills by students of high school age drawn from similar populations.

The experiment seems to indicate that appropriate, sufficient, individualized materials for such a reading program can be prepared without undue time or stress on the part of a reading teacher.

The results also seem to indicate that the timing of such a reading program faces some problems during the

summer months. Factors such as summer camps, family vacations, and summer jobs may interfere with regular practice periods thus affecting gains made by this method.

5. Recommendations for Further Study

The following five recommendations are made for further study:

1. Would older students show more profit from independent practice of reading skills under the independent method?
2. Could younger students work independently under such a reading improvement program thus making it possible for more students to profit from work during the summer months with a minimum of teacher effort and time?
3. Would an independent practice program for reading skills improvement show more gain if conducted during the regular school session when summer activities would not interfere as greatly and the stress for reading improvement in completing regular homework assignments would be a more immediate need?

4. Would more variety of materials or different materials tend to produce better results?
5. Will the amount of gain shown by the students in the experimental group be retained after three, six, or twelve months' time?

More experimentation with the independent practice method under some of the circumstances listed above, with greater numbers of students, or with students representing different geographical locations is needed before the validity of the method can be accepted without question.

B I B L I O G R A P H Y

96

BIBLIOGRAPHY

- Anderson, Ruth H, "Aspects of Developmental Reading," California Journal of Secondary Education (1942), 17:472-474.
- Beasley, Charles E., Jr., "A Freshman Reading Program," Journal of Developmental Reading, II (Winter, 1959).
- Bennett, A. L., "Two Experimental Groups in Reading," College English, XV (January, 1954).
- _____, "An Experiment in Reading," Michigan Education Journal, XXX (January, 1953).
- Blayne, Thornton C., "Retention of Skills Acquired in Developmental Reading Programs," School and Society, LXIII, (January 12, 1946).
- Board of Education, City of New York, The Retarded Reader in the Junior High School, Bureau of Educational Research, Publication Number 31 (September, 1952).
- Broening, Angela, "Abilities Which Contribute to Effective Reading," Education (September, 1941), 62:11-17.
- Cilley, Ida May, "An Evaluation of Three Time-Schedules in Remedial Reading," Unpublished Master's thesis, Boston University, Boston, Massachusetts, 1958.
- The Commission on the English Curriculum of the National Council of Teachers of English, The English Language Arts in the Secondary School. Chapter VII, "Developing Competence in Reading," New York: Appleton-Century-Crofts, Inc., 1956.
- Cruze, Wendell W., Educational Psychology. New York: The Ronald Press, 1942.
- Davis, Curtis H., "Improving Reading Ability of High School Seniors," California Journal of Secondary Education (November, 1937), 12:424-429.

- Davis, George A., Educational Psychology, New York: McGraw-Hill, 1948.
- Dobbins, Elizabeth M., "A Study of Reading Achievement Made Under Remedial Instruction," Unpublished Master's thesis, Boston University, Boston, 1951.
- Durrell, Donald D., Improving Reading Instruction. Yonkers-on-Hudson, New York: World Book Company, 1956.
- Fallon, Eleanor, and others, "Mass Differentiated Reading Skills Instruction in High School." Unpublished Master's thesis, Boston University School of Education, Boston, 1960.
- Fox, Lorence K., and Constance M. McCullough, "Individualizing Reading," NEA Journal, 47 (March, 1958).
- Garrett, Henry E., Statistics in Psychology and Education. Fifth Ed. New York: Longmans, Green and Co., 1958.
- Gates, Arthur I., "What Research Says to the Teacher," Teaching Reading, Department of Classroom Teachers, American Educational Research Association, Association of the National Education Association (June, 1953).
- Gray, William S., "Summary of Reading Investigations July 1, 1946 to June 30, 1947," Journal of Educational Research, XLI (February, 1948).
- Goldberg, Murray A., "Can Reading Ability Be Improved More Effectively Through Wide Reading or Intensive Drill?" High Points, XXVIII (February, 1946).
- Griffith, Coleman R., Psychology Applied to Teaching and Learning. New York: Farrar and Rinehart Inc., 1939.
- Guthrie, Edwin R., and Francis F. Powers, Educational Psychology. New York: The Ronald Press Company, 1950.

- Herber, Harold L., "Developing Students' Reading Power Independently Through Guidance," Unpublished study, Floral Park, Long Island, New York, 1961.
- Henry, Lyle K., and A. R. Lauer, "A Comparison of Four Methods of Increasing the Reading Speed of College Students," Proceedings of the Iowa Academy of Science, XLVI (1939).
- Hunt, J. T., "What High School Teachers Should Know About Individual Differences in Reading," School Review (October, 1952), 60:423.
- Jex, Frank B., University of Utah Studies in Prediction of Academic Success. Education Monographs, Number I, University of Utah, 1957.
- Jillson, Richmond P. "An Investigation of the Clinical Possibilities of Certain Abbreviated Forms of the Wechsler Intelligence Scale for Children," Unpublished Master's thesis, Boston University, Boston, 1959.
- Johnson, G. Orville, "A Critical Evaluation of the Problem of Remedial Reading," The Elementary School Journal (January, 1957), 57:217-18.
- Kinder, Robert F., "Types and Frequency of Difficulties of Secondary School Reading Skills," Unpublished Doctoral Dissertation, Boston University School of Education, Boston, 1957.
- Leavell, Ullin W., and Grace E. Wilson, "Guided Free Reading Versus Other Methods in High School English," Peabody Journal of Education, XXXIII (March, 1956).
- Lewis, Martha, "Improving the Reading Ability of Vashon High School Students," The Saint Louis Public School Journal, I (September, 1945).
- McCullough, Constance M., "What Does Research Reveal about Practices in Teaching Reading?" English Journal, XLVI (October, 1957).
- McGlinchey, Barbara M., "Cut-Up Workbooks Versus Bound Workbooks in the Development of Reading Skills," Unpublished Master's thesis, Boston University, Boston, 1961.

- Natchez, Gladys, Personality Patterns and Oral Reading. New York: New York University Press, 1959.
- Niles, Olive S., and Margaret J. Early. "Adjusting to Individual Differences in English," Journal of Education (December, 1955), 138:3.
- Noall, Mabel S., "Automatic Teaching of Reading Skills in High School," Journal of Education (February, 1961), 143.6.
- Richey, Herman G., "Population Change," Encyclopedia of Educational Research, New York: Macmillan Company, 1960.
- Roth, Robert M., "A Theory of Voluntary Remedial Reading Programs," Journal of Developmental Reading, IV (Winter, 1961).
- Safford, Alton L., "Evaluation of an Individualized Reading Program," The Reading Teacher, XIII (April, 1960).
- Schubert, Delwyn G., "12 Sensible Steps in Remedial Reading," Clearing House (October, 1953), 28:80-81.
- Silberman, Harry F., Studies of Teacher Behavior: Effects of Praise and Reproof on Reading Growth in a Non-Laboratory Classroom Setting. Division of Teacher Education. Board of Higher Education of the City of New York. Research Series 33 (June, 1956).
- "Spotlighting Public Education in 1960," NEA Research Bulletin, 38, No. I (February, 1960).
- "Statistics for 1957-58," NEA Research Bulletin, 36, No. I (February, 1958).
- Tormey, Mary K. and Walter G. Patterson, "Developmental Reading and Student Evaluation," Journal of Developmental Reading, (Winter, 1959), 2:30-43.
- Umstatted, J. G., and Robert D. Thornton, "Secondary Education--Student Population," Encyclopedia of Educational Research, Third Edition, New York: Macmillan Company, 1960.

- Watts, Phyllis W., "An Application of Clinical Diagnostic Techniques in the Classroom Situation for the Improvement of Reading at the College Level," Journal of Educational Research, XVII (March, 1949).
- Weeks, Lewis E., Jr., "Speeding Up Reading: A Self-Help Program for College Freshmen," Journal of Developmental Reading, III (Autumn, 1959).
- White, Virginia L., "An Analysis of Reading Workbooks for Grades 4, 5, 6," Unpublished Master's Thesis, Boston University, Boston, 1957.
- Wilson, Grace E., "Accelerator Training," Peabody Journal of Education, XXXIV (July, 1956).
- Woodworth, Robert S., Experimental Psychology. New York: Henry Holt and Company, 1935.

A P P E N D I C E S

APPENDIX A

SECONDARY READING EXPERIMENTAL CLASS, Summer, 1961

Boston University - Noall

List 1

Pre-test Results

Students	Gr. Plac.	Age	Potential		IOWA SILENT READING TEST										Totals *		M. Noall			Michigan	
			I.Q.	Gr. Exp.	Sub-scores in percentiles										Gr. Tile	Gr. Eq.	Mc. Spell	Vis. Men.	Phon. Spell	Gr. Tile	Gr. Eq.
					Rate	Comp.	D.R.	P.	W.M.	S.M.	F.	Ind.	K.W.								
A	12	18-5	132	17.5	91	3	56	35	22	7	52	88	25	27	9.5	7.7	5.5	f	3	7.7	
B	12	17-5	113	14.2	82	80	75	91	79	86	52	88	79	90	14.0	9.8	9.0	5.0	70	13.1	
C	9	16-2	115	13.4	4	59	36	3	5	2	5	39	42	1	5.2	3.5	9.0	-	11	6.2	
D	8	14-4	106	8.8	94	82	83	40	87	82	88	68	63	86	12.5	9.3	9.0	3.0	88	10.1	
E	9	14-11	134	13.3	90	97	99	96	99	97	88	99	97	99	f	13.0			99	16.0	
F	8	15-0	71	5.6	7	38	14	15	7	55	-	17	29	8	6.8	6.0	8.0	3.0	6	5.4	
G	10	16-2	94	10.0	27	21	1	2	35	49	39	21	23	19	8.3	9.3	7.0	5.0	14	7.5	
H	11	16-2	114	14.4	26	84	44	51	70	66	87	24	83	72	12.5	6.5	f	4.5	9	8.0	
I	11	17-3	115	13.9	85	65	34	29	56	54	67	89	9	60	12.0	10.5	f	f	40	9.0	
J	11	16-4	116	13.6	41	23	56	79	58	59	52	97	91	67	13.0	10.0	f	f	1	5.0	
K	10	14-10	119	12.8	37	38	63	44	35	57	39	12	65	37	9.0	6.4	7.0	7.5	16	6.2	
L	12	18-1	122	15.6	91	98	75	69	65	74	97	80	91	87	f	6.0	9.0	5.5	30	10.5	
M	12	19-2	103	12.5	95	49	39	8	79	31	74	3	9	40	11.0	8.4	10.0	3.0	19	9.8	
N	11	16-4	110	11.8	1	65	60	1	32	34	4	16	36	7	7.9	10.6	f	f	31	8.0	
O	9	14-10	150	14.5	50	45	46	89	85	82	67	8	63	71	11.6	9.3	f	f	81	11.2	
P	11	16-6	107	12.1	21	70	44	40	36	63	35	16	30	32	9.5	11.2	3.0	7.0	11	8.4	
Q	12	18-0	113	14.2	26	23	16	4	29	14	-	20	64	11	8.6	8.8	6.5	4.5	-	4.8	
R	7	12-5	138	11.0	19	82	36	3	58	29	3	28	36	22	7.9	6.6	6.5	-	14	5.5	
S	11	16-9	123	14.4	53	76	77	5	41	54	35	39	83	49	11.0	7.7	6.0	5.5	30	9.7	
T	7	12-7	100	7.9	76	1	14	9	11	50	1	58	29	8	6.8	6.6	6.5	6.5	37	5.3	
U	11	17-3	84	9.3	12	25	34	21	13	1	3	4	49	10	8.2	3.3	6.0	-	-	3.0	
V	10	15-3	131	14.5	92	96	93	84	97	92	50	96	95	98	f	12.5	11.0	6.0	78	12.2	

* f Means above norms.

APPENDIX B

SECONDARY READING EXPERIMENTAL CLASS, Summer, 1961

Boston University - Noall

List 2

Post-Test Results

Stu- dents	Gr. Plac.	Age	Potential		Low Silent Reading Test								Totals		M.-Mc. Spell	Michigan		
			I.Q.	Gr. Exp.	Rate	Comp.	D.M.	F.	W.M.	S.N.	F	Ind.	K.W.	Gr. Tile		Gr.* Eq.	Gr. Tile	Gr. Eq.
A	12	18-5	132	17.5	94	4	88	52	32	4	49	77	57	54	f	7.5	30	10.7
B	12	17-5	113	14.2	96	99	91	69	90	67	94	77	79	95	f	9.8	95	f
C	9	16-2	115	13.4	34	38	66	62	3	42	14	68	47	39	9.0	5.2	28	7.5
D	8	14-4	106	8.8	99	95	88	62	99	76	94	68	72	91	f	10.5	99	f
E	9	14-11	134	13.3	99	78	99	82	99	87	97	98	92	99	f	12.5	99	f
F	8	15-0	71	5.6	34	8	46	1	2	16	14	28	11	7	6.6	5.1	40	7.5
G	10	16-2	94	10.0	90	13	73	44	52	13	12	12	23	19	8.3	7.7	76	12.3
H	11	16-2	114	14.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
I	11	17-3	115	13.9	99	95	34	59	75	28	80	78	57	84	f	7.7	86	14.0
J	11	16-4	116	13.6	99	91	85	96	82	18	42	99	70	90	f	9.3	27	9.5
K	10	14-10	119	12.8	97	95	74	89	93	42	47	28	72	79	12.7	7.5	52	8.3
L	12	18-1	122	15.6	82	92	84	52	77	76	93	83	72	86	f	6.6	77	14.0
M	12	19-2	103	12.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N	11	16-4	110	11.8	47	38	53	51	21	48	42	24	70	41	10.9	9.3	27	9.5
O	9	14-10	150	14.5	99	52	83	92	98	84	92	78	92	96	f	10.5	79	11.0
P	11	16-6	107	12.1	97	76	89	96	50	48	67	89	92	94	f	10.5	84	13.8
Q	12	18-0	113	14.2	46	54	30	35	56	42	2	80	91	52	13.0	8.8	2	7.3
R	7	12-5	138	11.0	97	71	66	40	75	24	34	58	47	57	10.4	8.0	30	6.3
S	11	16-9	123	14.4	97	70	75	59	82	66	63	50	70	67	f	7.7	35	10.0
T	7	12-7	100	7.9	79	19	46	62	46	4	52	17	47	44	9.4	6.8	73	8.3
U	11	17-3	84	9.3	47	14	17	29	5	5	14	4	16	6	7.7	4.2	2	4.0
V	10	15-3	131	14.5	98	97	93	89	99	99	96	87	83	99	f	13.0	90	14.0

*f Means above norms.

APPENDIX C
List 3

Schedule for Orientation Period

Time in Minutes	Activity	June 8 Thursday	June 12 Monday	June 13 Tuesday	June 14 Wednesday	June 15 Thursday
15	Together as a Group	Clinician #1 Alarm Clock Techniques	Clinician #2 Keeping a Record	Clinician #6 Phrase Reading	Clinician #10 Skimming for Patterns in Paragraphs	Clinician #3 Studying Spelling
20	Spelling Flow of Ideas-Word Analysis Locational Skills Following Directions Vocabulary-Context Words Confused Syn-Ant	Clinician 3 10 6 7 2	Clinician 8 1 10 9 4	Clinician 5 8 4 1 3	Clinician 2 6 9 7 1	Clinician 4 8 5 10 2
45	Organization, Ad- vanced Organization in Depth Speeded Techniques Tachistoscope Prac- tice Comprehension	Clinician 1 10 7 6 5	Clinician 6 3 5 8 2	Clinician 2 9 7 10 6	Clinician 4 Director 3 8 5	Clinician 7 Director 6 1 9
20	Phonics Vocabulary-Advanced Critical Reading Skimming	Clinician 8 9 5 10	Clinician 5 6 10 9	Clinician 3 8 2 5	Clinician 2 10 3 1	Clinicians All Planning Independent Practice
15	Together as a Group	Director Flow of Ideas	Clinician #7 Multi-Meaning Words	Clinician #9 Patterns from Lists	Clinician #8 Speed Tests	Clinician #5 Announcement of Post-Test Question Time

APPENDIX D

List 4. Materials Used in Orientation Period

Altick, Richard D. <u>Preface to Critical Reading.</u> Henry Holt, 1951.	10 - up \$2.85
Controlled Reader Educational Developmental Laboratories 75 Prospect, Huntington, New York.	
Dolch, E. W. Phonic Materials "Basic Sight Cards" "Sight Phrase Cards"	1-9; Remedial \$1.10 \$1.00
Durrell, Donald D., <u>et al.</u> Word Analysis Cards, A. B. and C. World Book Company	4-6; Remedial \$2.00
Hovious, Carol <u>Following Printed Trails</u> D. C. Heath, 1936	9-12; Remedial 13 \$2.48
Iowa Silent Reading Test, Advanced Greene, H. A., Jorgenson, A. N., and Kelley, V. H. World Book Company, Yonkers, New York.	
Lewis, Norman <u>How to Read Better and Faster</u> Thomas Y. Crowell Co. New York, 1951	College
McCall, William A., and Crabb Lelah Mae <u>Standard Test Lessons in Reading</u> Bureau of Publication, Teachers College Columbia University, New York, 1950 Books A - E	2-12 \$.45
Michigan Speed of Reading Test Greene, Edward B., Psychological Corporation 522 Fifth Avenue, New York 18, New York, 1937.	

Morrison-McCall Spelling Scale
Morrison, J. C., and McCall, W. A.
World Book Company, Yonkers, New York, 1923.

Rateometer
Audio-Visual Research
Box 71, Waseca, Minnesota

Reader's Digest Educational Services, Inc.
Reader's Digest
Reader's Digest Association, Pleasantville,
New York.
Student Edition with Teacher's Edition

S R A Reading Accelerator
Science Research Associates
259 East Erie Street, Chicago 11, Illinois

S R A Reading Laboratory, Secondary Edition
Science Research Associates
259 East Erie Street, Chicago 11, Illinois
Reading Books and Teacher's Handbook
available. 7-12 \$46.50

S R A Reading Laboratory, IVa
Science Research Associates
259 East Erie Street, Chicago 11, Illinois
Record Books and Teacher's Handbook
available. 9-13
(Known as the College Prep Edition)

S R A Reading for Understanding
Science Research Associates
259 East Erie Street, Chicago 11, Illinois
Record Books and Teacher's Handbook
available. 10-14 \$29.50

S R A Spelling Laboratory (two editions) 4-8; Remedial
Science Research Associates \$20.00
259 East Erie Street, Chicago 11, Illinois

Simpson, Elizabeth A.
S R A Better Reading Book, I-111
Science Research Associates, 1950. 5-13 \$2.40

Tach-X

Educational Development Laboratories
75 Prospect, Huntington, New York

Wechsler Intelligence Tests

The Psychological Corporation
522 Fifth Avenue, New York 18, New York.

APPENDIX E

List 5. Materials Used in Independent Practice

Altick, Richard D. <u>Preface to Critical Reading</u> Henry Holt Co., 1951.	10-up \$2.85
Armstrong, Leila and Hargrave, Rowena <u>Building Reading Skills</u> McCormick-Mathers, 1951-58.	1-6 \$.64 - \$1.56
Gates, Arthur I., and Peardon, C. O. <u>Practice Exercises in Reading</u> Bureau of Publication, Teachers College Columbia University, 1933.	3-6; Remedial 7-9 \$1.45
Gray, William S.; Monroe, Marion, and Artley, A. Ster. <u>Basic Reading Skills for High School Use</u> Scott, Foresman and Company, 1958.	7-8; Remedial 9-12 \$1.20
Guiler, W. S., and Coleman, J. H. <u>Reading for Meaning</u> J. B. Lippincott, Chicago, 1955.	4-12 \$.88
Hardwick, H. C. <u>Words Are Important</u> C. S. Hammond, 1951.	7-13 \$.35
Kelley, V. H., and Green, H. A. <u>Better Reading and Study Habits</u> World Book Company, 1947.	9-13 \$.64
Lewis, Norman <u>How To Read Better and Faster</u> Thomas Y. Crowell Co. New York, 1951.	College

McCall, William A., and Crabbs, Lelah Mae <u>Standard Test Lessons in Reading</u> Bureau of Publications, Teachers College Columbia University, 1950 Books A - E	2-12 \$.45
Meighen, Mary, et al. <u>Phonics We Use</u> Lyons and Carnahan	1-6; Remedial \$.52
Miller, Lyle L. <u>Increasing Reading Efficiency</u> Henry Holt, 1956.	College \$3.25
Patton, David H., and Johnson, Eleanor M. <u>Spelling for Word Mastery</u> Charles E. Merrill, 1959.	2-8 Teacher's Manual \$1.00 Textbook \$1.52; Skill Test \$.76; Spelling Notebook \$.32
Reader's Digest Educational Services, Inc. <u>Reader's Digests, Student Edition</u> Readers Digest Association, Pleasantville, New York. Teacher's Edition available.	\$.20
Salisbury, Rachel <u>Better Work Habits</u> Scott, Foresman, 1932.	9-12 Out of Print
Smith, Nila B. <u>Be A Better Reader, Books I-VI</u> Prentice-Hall, 1956-1960.	7-12 I-III \$1.64 IV- V \$1.68 VI \$1.92
Strang, Ruth <u>Study Type Reading Exercises,</u> <u>Revised.</u> Bureau of Publication, Teachers College Columbia, New York	7-12 \$.80 Teacher's Manual \$.30
Stroud, J. B., and Ammons R. B. <u>Improving Reading Ability,</u> <u>Revised</u> Appleton-Century-Crofts, 1957.	College Freshmen \$2.35

